Water quality in many areas of the basin is affected to varying degrees by land uses that include livestock grazing, road construction, logging and mining (Ecovista, 2004b). The IDEQ has classified many water bodies in the Salmon River basin as impaired under section 303(d) of the CWA (IDEQ 2011). The primary parameters of concern are sediments, nutrients, flow alteration, high stream temperatures, and habitat alteration. Please refer to the following website for reach-specific 303(d) listed stream segments within the basin: http://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report.aspx.

Agricultural diversions within the Salmon River basin have a major impact near developed areas, particularly the Lemhi River, Pahsimeroi River, the mainstem Salmon River, and several other tributaries of the Salmon River. Although the majority of diversions accessible to ESA-listed species are screened, several need repair and upgrading. A major problem is localized stream de-watering due to over allocation. In addition to water diversions, numerous small pumping operations for private use occur throughout the subbasin. Impacts of water withdrawal on fish production are greatest during the summer month when streamflows are critically low (Ecovista 2004b).

Grazing on private lands continues to impact aquatic and riparian habitat. Grazing impacts are particularly noticeable in the lower reaches of most of Lemhi River tributaries, the Pahsimeroi subbasin, Panther Creek subbasin (upper Napias Creek above Smith Gulch, in Sawpit Creek and Phelan Creek), and the North Fork Salmon River subbasin (Hull Creek, Hughes Creek, and Indian Creek subwatersheds) (USFS 2000).

Mining, though no longer as active as it was historically, is still prevalent in parts of the Salmon River basin. Impacts from mining include severe alteration of substrate composition, channel displacement, bank and riparian destruction, and loss of instream cover and pool forming structures. Natural stream channels within the Yankee Fork, East Fork of the South Fork, and Bear Valley Creek have all had documented spawning and rearing habitat destroyed by dredge mining. Furthermore, heavy metal pollution from mine wastes and drainage can eliminate all aquatic life and block access to valuable habitat as seen in Panther Creek (IDFG 1990).

2.4. Effects of the Action on the Species and its Designated Critical Habitat

"Effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

2.4.1. Effects on ESA-listed Fish

NMFS anticipates that the proposed activities would directly affect listed fish through handling, relocating, stranding, and disturbing them. In addition, there would likely be effects on water quality (e.g, increases in suspended sediment, water temperature, and chemical contamination)

and potential effects on habitat (e.g., sediment deposition and streambank alteration). The magnitude of these effects will vary as a result of the nature, extent, and duration of the individual project activities, though the major factors would be whether or not any work occurs in the stream and whether ESA-listed fish are present at the time of implementation. The FHWA and COE determined that implementing the proposed programmatic action was "likely to adversely affect" Snake River spring/summer Chinook salmon, Snake River steelhead, Snake River sockeye salmon, Snake River fall Chinook salmon, and critical habitat for all these species within the action area.

Table 1 above lists eategories of projects that would adversely affect fish, as well as categories of projects that are not likely to adversely affect fish. We discuss projects that are not likely to adversely affect fish below Section 2.11 *"Not Likely to Adversely Affect" Determinations.* Projects that would adversely affect fish include: (1) Two-lane bridge construction over water; (2) bank stabilization with riprap, gabion baskets, or MSE walls; (3) culvert installation, maintenance, or extension for perennial streams[7]; (4) geotechnical drilling; (5) small structure repair; and (6) construction of wide shoulder notches requiring instream work. The majority of adverse effects from these activities will come from non-lethal turbidity plumes. All of these categories of actions, with the exception of geotechnical drilling, include the possibility of fish removal and handling, and the subsequent risk of killing fish. Fish removal and handling, however, will not be required for most individual projects in many of the categories of actions. Fish are seldom removed or handled during bank stabilization actions due to the difficulty of isolating the work area and the low risk of fish mortality from the actions. Similarly, fish are seldom removed or handled during small structure repair, culvert maintenance, or culvert extension. The primary instances in which fish handling and removal will occur are during two-lane bridge construction and culvert replacement.

The conservation measures included in the proposed action (such as low water work windows, fish work windows set by IDFG, and fish avoidance measures) will ensure that no adult fish are present during the construction phase of any of these actions. Juvenile spring/summer Chinook salmon, fall Chinook salmon, and steelhead, on the other hand, may be present, and are expected to experience adverse effects from individual projects under this program. Juvenile sockeye are not expected to be present during any project implementation. No state highways are located adjacent to the lakes in the Sawtooth Valley where juvenile sockeye rear, and out-migrating sockeye will not be present at potential project sites on the Salmon River during fish work windows, which generally run from early July to mid-August. Critieal habitat for spring/summer Chinook, steelhead, fall Chinook, and sockeye salmon may experience adverse effects on water quality, substrate, forage, riparian vegetation, and floodplain connectivity.

The proposed activities would directly affect individual fish through noise at construction sites, handling and stranding at temporarily de-watered stream reaches, and exposure to reduced water quality. We discuss each of these effects below.

[7] During development of the action, NMFS, USFWS, and ITD understood "perennial streams" to refer to fish-bearing streams, which could include some intermittent fish-bearing streams. This Opinion therefore assumes that the perennial streams referred to in the action include all fish-bearing streams.

2.4.1.1. Noise

Noise from heavy equipment operating adjacent to live water may disturb fish in the immediate vicinity causing short-term displacement. Heavy equipment operation for multiple categories of activities, including geotechnical drilling, will create noise, vibration, and potentially water surface disturhance. Heavy equipment operation will only occur away from the stream channel, or in de-watered stream channels. Popper et al. (2003) and Wysocki et al. (2007) discussed potential impacts to fish from long-term exposure to anthropogenic sounds, predominately air hlasts and aquaculture equipment, respectively. Popper et al. (2003) identified possible effects on fish including temporary, and potentially permanent hearing loss (via sensory hair cell damage), and masking of potentially biologically important sounds. Studies evaluated noise levels ranging from 115 to 190 decibels (dB). Wysocki et al. (2007) did not identify any adverse impacts on rainbow trout from prolonged exposure to three sound treatments common in aquaculture environments (115, 130, and 150 dB). In the studies identified by Popper et al. (2003) that caused ear damage in fishes, all evaluated fish were caged and thus incapable of moving away from the disturbance.

Machinery operation adjacent to the stream will be intermittent in all cases. The FHWA (2008) indicates backhoe, grader, loader, and truck noise production ranging between 80 and 89 dB, and rock drilling noise production ranging 85 to 98 dB. Because the decibel scale is logarithmic, there is nearly a 60-fold difference between noise levels expected from the action and noise levels known to have generated adverse effects to surrogate species, as discussed above. Therefore, noise related disturbances of this magnitude are unlikely to result in injury or death. It is unknown if the expected dB levels will cause fish to temporarily move away from the disturhance or if fish will remain present. Even if fish move, they are expected to migrate only short distances to an area they feel more secure and only for a few hours in any given day. Each day fish are routinely disturbed by passing birds, walking mammals, and other fish. NMFS does not anticipate short-term movements caused by construction equipment or geotechnical drilling noise will result in effects different than those fish typically experience. The expected noise levels and level of disturbance will he minimal and are insignificant.

Noise from pile-driving is also likely to disturb fish in the immediate vicinity causing short-term displacement. Pile-driving may be necessary for two-lane bridge replacements and for retaining walls (MSE walls). Pile-driving will not occur in live water. For bridge replacement projects, the new structure must he single-span, with the new ahutments (potentially requiring pile-driving) located ahove and behind the OHWM elevation on the existing channel side slope. Because pile-driving will not occur in live water, NMFS expects that sound exposure level (SEL) for ESA-listed fish will be well below 183 dB, the threshold for injury to fish established by the Fisheries Hydroacoustic Working Group (FHWG) (2008).

2.4.1.2. Fish Handling

De-watering of stream channels and associated fish-handling procedures to remove fish from these stream reaches will adversely impact individual juvenile fish. As stated above, no adult

ESA-listed fish, or sockeye salmon of any life-stage, are likely to be present during de-watering due the fish work windows to be provided by IDFG or NMFS. Juvenile fall Chinook are also not likely to he present at projects sites requiring de-watering. De-watering will primarily be necessary for two-lane bridge replacements and culvert replacements. Fall Chinook in the action area occupy the mainstem Clearwater River, the lower mainstem Salmon River, and possibly larger tributaries of these two rivers. These rivers are all too wide for a two-lane bridge with a single-span structure. Culvert replacements may occur on small trihutaries to the mainstem rivers occupied by fall Chinook, but such small tributaries generally do not provide habitat for rearing juvenile fall Chinook. Thus, only juvenile steelhead and spring/summer Chinook salmon are likely to be present at project sites requiring de-watering and to experience negative impacts.

If fish handling is required, it will be done by either electrofishing before de-watering or hand-netting after de-watering. Personnel from agencies such as the USFS, IDFG, Tribes, or other qualified personnel with appropriate training and experience will conduct all fish handling. NMFS expects that stream de-watering, and the capture, handling, transport, and release of ESA-listed fish will strand some fish, disrupt normal behavior, and cause short-term stress, injury, and occasional mortality. Due to design criteria and timing of the proposed action, only juvenile fish are expected to be handled or disturbed. The following section describes the amount and type of fish handling expected, the level of harm or take likely to occur as a result of that handling, and the number of fish expected to be stranded as a result of the programmatic action.

The COE and FHWA did not limit the number of fish handling and removal projects that might occur in a given year within the action area. Based on previous experience and on information provided by ITD, NMFS believes that the number of two-lane bridge construction projects that would occur within the action area would be no more than two per subhasin (4^{th}-field HUC) within any year (Z. Funkhouser, ITD District 2, personal communication). The number of two-lane hridge construction projects across the entire action area would not be more than six per year. Similarly, based on previous experience, NMFS assumes that the number of all other types of projects potentially requiring de-watering and fish salvage would be no more than 10 per year within a subbasin, and no more than 40 per year throughout the entire action area.

Hand-netting. At some project sites requiring de-watering of a stream reach, fish will be removed from the stream reach with hand nets. This may cause some stress and harm. Capturing and handling fish causes them stress, though they typically recover fairly rapidly from the process. Types of stress likely to occur during project implementation include increased plasma levels of cortisol and glucose (Frisch and Anderson 2000; Hemre and Krogdahl 1996). Even short-term, low intensity handling may cause reduced predatory avoidance for up to 24 hours (Olla et al. 1995). The primary contrihuting factors to stress and death from handling are differences in water temperatures (hetween the river and wherever the fish are held), dissolved oxygen conditions, the amount of time that fish are held out of the water, and physical trauma. Stress on salmonids increases rapidly from handling if the water temperature exceeds 64.4°F or dissolved oxygen is below saturation. Fish that are transferred to holding tanks can experience trauma if eare is not taken in the transfer process. Table 10 provides an estimate of the number of fish to be handled under the proposed action. NMFS assumes that all handled fish will be held in 5 gallon buckets filled with stream water for a period only long enough to

transport fish to an appropriate release site immediately upstream of the individual project sites. Buckets will likely be placed into the water and slowly inverted to allow captured fish to move into the selected release sites. Handling fish in this manner is likely to minimize the potential stress fish experience.

Electrofishing. The effects of electrofishing on juvenile steelhead and spring/summer Chinook salmon will consist of the direct and indirect effects of exposure to an electric field, capture by netting, and handling associated with transferring the fish back to the river (described above). Most of the studies on the effects of electrofishing have been conducted on adult fish greater than 12 inches in length (Dalbey et al. 1996). The few studies that have been conducted on juvenile salmonids indicate that spinal injury rates are substantially lower than they are for large fish. Smaller fish intercept a smaller head-to-tail potential than larger fish (Sharber and Carothers 1988) and may therefore be subject to lower injury rates (Dalhey et al. 1996; Thompson et al. 1997). McMichael et al. (1998) found a 5.1% injury rate for juvenile middle Columbia River steelhead captured by electrofishing in the Yakima River subbasin; while Ainslie et al. (1998) reported injury rates of 15% for direct current applications on juvenile rainbow trout. The incidence and severity of electrofishing damage is partly related to the type of equipment used and the waveform produced (Sharber and Carothers 1988; Dalbey et al. 1996; Dwyer and White 1997). Continuous direct current or low-frequency (equal or less than 30 Hz) pulsed direct current have been recommended for electrofishing because lower spinal injury rates occur with these waveforms (Dalbey et al. 1996; Ainslie et al. 1998). Only a few recent studies have examined the long-term effects of electrofishing on salmonid survival and growth (Ainslie et al. 1998; Dalbey et al. 1996). These studies indicate that although some of the fish suffer spinal injury, few die as a result. However, severely injured fish grow at slower rates and sometimes show no growth at all (Dalbey et al. 1996).

As explained above, electrofishing will be conducted by qualified personnel with appropriate training and experience, who will follow standard guidelines (NMFS 2000) that will minimize the levels of stress and mortality related to electrofishing. For example, field crews will be trained in observing animals for signs of stress and shown how to adjust electrofishing equipment to minimize that stress. Although McMichael et al. (1998) indicated electrofishing injury rates for wild salmonids were only 5%, NMFS assumes a more conservative injury rate of 25% (Nielson 1998) of the total number of fish electrofished to account for variable site conditions and experience levels.

Take Calculations. NMFS has calculated lethal and non-lethal take from fish handling for juvenile steelhead and spring/summer Chinook. To do so, we made the following assumptions about the number of individuals likely to be present at a project site, and about injury and death rates for different fish handling methods. These assumptions lead to the take calculations presented in Table 10.

- A maximum of 46 project sites per year will involve de-watering of stream reaches and handling and removal of individual ESA-listed fish from these stream reaches. A maximum of six of these projects per year will be bridge replacements.

- The typical area of stream channel that would be de-watered at each bridge replacement project will be approximately 100 feet in length by 50 feet in width (25 feet in width for each pier of the old bridge). This amounts to an estimated 5,000 square feet of stream channel at each bridge, and approximately 30,000 square feet for all bridge projects per year. The typical area of stream channel to be de-watered at all other projects is based on assumptions made by NMFS for a similar programmatic culvert replacement action (NMFS 2006c), approximately 130 feet in stream length by 8 feet in bankfull width. This amounts to approximately 1,040 square feet of stream channel at each project site; and 41,600 square feet for all non-bridge-replacement projects per year. Total de-watered area per year for all projects would thus be approximately 71,600 square feet.

- The stream habitat to be de-watered will be in poor condition in terms of juvenile salmonid density. Stream habitat immediately adjacent to state highways is often altered by the roadway and floodplain encroachment. Additionally, the sites identified for de-watering are likely to be very shallow or dry at the time of de-watering. Therefore, NMFS believes that fish densities represented by poor habitat conditions represent the highest juvenile fish densities likely to occur in the stream reaches de-watered under this program.

- The following densities of fish are likely to be found in poor quality stream habitat in Idaho: 1.1 juvenile Chinook/100 square feet; 0.6 juvenile steelhead/100 square feet (Hall-Griswold and Petrosky 1996).

- 70% of individual fish in the de-watered areas will be captured by nets (based on USFWS 2004—an opinion for a similar action in Oregon and Washington).

- Of the remaining individuals, 50% will be captured through electrofishing (Peterson et al. 2004).

- Electrofisbing will injure 25% of fish captured (Nielson 1998) and kill 5% of fish captured (Hudy 1985; McMichael et al. 1998).

- Many of the remaining fish will be collected with nets out of pools as the stream reach is slowly de-watered, but up to half may be stranded in the de-watered reach and die (7.5% of total fish in the stream reach before handling).

- Species and life-stages occupying de-watered stream reaches during project implementation will include juvenile spring/summer Chinook and juvenile steelhead.

Table 10. Estimates for the number of fish across the actions that will be disturbed, injured, or killed from netting, electrofishing, and de-watering as a result of annual implementation of the proposed action.

	Spring/summer Chinook Juveniles	Steelhead Juveniles
Maximum # of projects to handle fish per year	46	46
Maximum # of fish in de-watered stream reaches	788	430
Maximum # of fish injured by electrofishing per year	30	16
Maximum # of fish potentially killed by electrofishing per year (also included in injury total)	6	3
Maximum # of fish killed by stranding per year	59	32
Maximum total # of fish killed per year	**65**	**35**

As shown in Table 10, NMFS estimates that the proposed action will result in the capture, handling, transport, or stranding of a maximum of 788 juvenile Chinook salmon and 430 juvenile steelhead per year, with far fewer fish handled in most years of the 10-year programmatic action. This handling is likely to result in various levels of harm and stress. The conservation measures in the proposed action should reduce the potential harm to individuals during capture and transport such that the risk of death is minimized. Adequate monitoring of the number of fish handled will be necessary to validate assumptions and to adaptively manage the programmatic consultation to reduce take levels over time.

NMFS estimates that the proposed action is likely to directly result in the death of up to 65 juvenile spring/summer Chinook salmon and 35 juvenile steelhead per year (with far fewer fish killed in most years of the programmatic action), through electrofishing and stranding in de-watered stream reaches. NMFS further estimates that the proposed action will directly injure up to 30 juvenile spring/summer Chinook salmon and up to 16 juvenile steelhead per year through electrofishing.

To aid in our jeopardy analysis, NMFS converted the number of juvenile spring/summer Chinook or steelhead potentially killed or injured to the number of adult equivalents potentially killed or injured per year by the proposed action. To convert the juvenile mortality and injury numbers presented in Table 10 to a number of returning adults potentially lost or showing reduced fitness per year, NMFS made the following reasonably conservative assumptions:

- 50% parr-to-smolt survival for both spring/summer Chinook salmon and steelhead (Hall-Griswold and Petrosky 1996).

- 0.68% smolt-to-adult returns for spring/summer Chinook salmon (Arthaud and Morrow 2007).

- 0.65% smolt-to-adult returns for steelhead (Arthuad and Morrow 2007).

- For both species, mortalities will be evenly distributed across all populations in the action area (following the requirement that no more than two bridge replacements per subbasin be implemented each year). As shown in Tables 4 and 5, respectively, 10 spring/summer Chinook populations and 12 steelhead populations overlap with state highways.

Applying these assumptions, the estimated 65 juvenile spring/summer Chinook and 35 juvenile steelhead that may be killed through fish handling per year translate to 0.02 fewer returning Chinook adults and 0.01 fewer returning steelhead adults per year for each population in the action area. The estimated 30 juvenile spring/summer Chinook and 16 juvenile steelhead that could be injured each year translate to 0.01 spring/summer Chinook adults and 0.004 steelhead adults per population per year with potentially reduced fitness. Because most years of this programmatic action will likely see far fewer than 46 projects requiring fish handling, NMFS expects much less adult-equivalent mortality and reduced fitness than these estimates in most years.

Of the four VSP parameters, fish handling could affect abundance and productivity. NMFS does not consider the potential loss of a small fraction of one adult steelhead and one adult spring/summer Chinook salmon from a single year class to be a significant reduction in abundance for a population of either species, given current population abundance levels. Likewise, this potential loss of a fraction of an adult fish per population will have an insignificant effect on productivity. The ICTRT estimates current abundance for Idaho steelhead populations to range from 345 to 556 adult spawners per year (NMFS 2011d). Ford et al. (2011) estimate that current abundance for spring/summer Chinook populations with state highways (those highlighted in Table 4 above) ranges for 21 to 331 adult spawners per year. The population with a current mean abundance of just 21 spawners is the Yankee Fork. The only stretch of state highway in this population is where the Salmon River road crosses the Yankee Fork at its confluence with the Salmon River. Thus the Yankee Fork population is not likely to have any projects in most or even all of the 10 years of this program. The spring/summer Chinook population with the next lowest current abundance is Valley Creek, with a mean of 78 spawners per year. The loss of 0.01 to 0.02 adult fish per year is not large enough to impacts steelhead and spring/summer Chinook populations at their current abundances.

2.4.1.3. Water Quality-related Effects on Fish

Reductions in water quality from the proposed action could affect juvenile salmonids. The proposed action could degrade water quality through additions of suspended sediment to the

water column, increases in stream temperatures, or chemical contamination. All near-stream ground disturbing activities and in-stream work have the potential to create increased levels of suspended sediment in the water column. Water quality may also be adversely affected by increases in temperature caused by clearing riparian vegetation. Chemical contamination could occur any time heavy construction equipment is being used within or adjacent to the stream channel.

Suspended Sediment. Fish exposed to elevated turbidity levels may be temporarily displaced from preferred habitat or could potentially exhibit sublethal responses such as gill flaring, coughing, avoidance, and increases in blood sugar levels (Bisson and Bilby 1982; Sigler *et al.* 1984; Berg and Northcote 1985; Servizi and Martens 1991), indicating some level of stress (Bisson and Bilby 1982; Berg and Northcote 1985; Servizi and Martens 1987). The magnitude of these stress responses is generally higher when turbidity is increased and particle size decreased (Bisson and Bilby 1982; Servizi and Martens 1987; Gregory and Northcote 1993). The most critical aspects of sediment-related effects are timing, duration, intensity and frequency of exposure (Bash et al. 2001). Depending on the level of these parameters, turbidity can cause lethal, sublethal, and behavioral effects in juvenile and adult salmonids (Newcombe and Jensen 1996). Although turbidity may cause stress, Gregory and Northcote (1993) have shown that moderate levels of turbidity (35 to 150 NTUs) accelerate foraging rates among juvenile Chinook salmon, likely because of reduced vulnerability to predators (camouflaging effect). Turbidity and fine sediments can reduce prey detection, alter trophic levels, reduce substrate oxygen, smother redds, and damage gills, among other deleterious effects (Spence et al. 1996).

Conservation measures presented as part of the proposed action are intended to prevent the majority of sediment from being delivered to stream habitat but cannot prevent all sediment due to the nature of the in-channel work. Juvenile spring/summer Chinook salmon, fall Chinook, and steelhead may experience short-term adverse effects as a result. Substrate may inadvertently fall from excavation equipment buckets or accidentally be pushed over road or bank edges while working in close proximity to the stream channel during site preparation or during structure repair, replacement, or installation (e.g., culverts, bridges). Rain events during and following construction activities may also result in mobilization of disturbed soils resulting in stream delivery, even with sediment control measures in place (Foltz and Yanosek 2005). Rewatering of de-watered stream reaches may mobilize sediment in areas disturbed by project activity, such as removal of old bridge piers and abutments. However, conservation measures included in the proposed action will minimize the risk of sediment entering streams.

Conservation measures to reduce the likelihood and intensity of sediment plumes include sediment barriers between ground disturbance and the stream channel, and de-watering of streams and low-water work windows in cases where in-stream project activity is unavoidable. Sediment barriers will be placed around potentially disturbed sites where needed to prevent sediment from entering a stream directly or indirectly. An adequate supply of erosion control materials (e.g., silt fences or fiber wattles) will be on site to respond to emergencies and unforeseen problems. No machinery will enter live water. For bridge replacements, a barrier will be placed between the old bridge pier and live water to catch any falling debris during removal of the pier. Ground disturbance will not occur during or immediately after rain events. Disturbances are thus likely to be of short duration because only small amounts of sediment will

infrequently and inadvertently be introduced to the stream channel. Furthermore, ITD will monitor turbidity during project construction in order not to exceed state water quality standards. The NTU measurements will be taken 100 feet above and below discharge points, or as directed by appropriate resource agency or ITD personnel. State water quality standards require that turbidity not exceed background turbidity by more than 50 NTU instantaneously or more than 25 NTU for more than 10 consecutive days.

Based on similar past projects, NMFS expects that any resulting sediment plumes associated with the proposed action should be limited to 1,600 feet or less per project and should dissipate within a few minutes to hours at any given project site (Casselli et al. 2000; Jakober 2002; USFS 2005; and USFS 2007). Affected streams are likely to quickly return to background suspended sediment levels considering the expected small volume of substrate likely to be introduced (Casselli et al. 2000; Jakober 2002). Juvenile fish will likely respond to a turbidity plume for this distance along the streams edge by avoiding the plume and temporarily seeking alternate rearing areas. Fish present downstream from program activities are thus expected to be able to avoid or reduce their exposure to turbidity by swimming to adjacent, less turbid habitat (i.e., hehavioral response only). However, take, in the form of harming juveniles, is still likely to occur as a result of increased turbidity, as exposure of juveniles to predators will likely increase as they seek alternate rearing habitat. NMFS is unable to quantify the amount of harm to juveniles from exposure to project-related turbidity, but the amount is likely to be extremely low due to the avoidance responses explained above.

Temperature. The proposed action has the potential to reduce streamside shade through the removal of vegetation. Reductions in shade can increase the amount of solar radiation reaching the stream surface and lead to increases in steam temperatures. Elevated water temperatures may adversely affect salmonid physiology, growth, and development, alter life history patterns, induce disease, and may exacerbate competitive predator-prey interactions (Spence et al. 1996). As described in the proposed action, individual projects will be designed to preserve existing vegetation. In instances where riparian shrubs are removed during construction, vegetation will be replanted. Because actions completed under this programmatic consultation will occur on existing state highways, riparian vegetation removal is expected to be minimal enough to have unmeasureable effects on stream shade.

Chemical Contamination. Use of construction equipment and heavy machinery adjacent to stream channels poses the risk of an accidental spill of fuel, lubricants, hydraulic fluid, or similar contaminants into the riparian zone, or directly into the water. If these contaminants enter the water, these substances could adversely affect habitat, injure or kill aquatic food organisms, or directly impact ESA-listed species. Petroleum-based contaminants such as fuel, oil, and some hydraulic fluids contain poly-cyclic aromatic hydrocarbons, which can cause chronic suhlethal effects to aquatic organisms (Neff 1985). Ethylene glycol, the primary ingredient in antifreeze, has been shown to result in sublethal effects to rainhow trout at concentrations of 20,400 mg/L (Beak Consultants Ltd., 1995 as cited in Staples 2001). Brake fluid is also a mixture of glycols and glycol ethers, and has about the same toxicity as antifreeze.

Although all projects will require heavy machinery, equipment will not enter flowing water, which limits the potential for chemical contamination to occur. Furthermore, the FHWA and

COE have included multiple conservation measures in the BA aimed at minimizing the risk of fuel or oil leakage into the stream. A spill prevention and contingency plan will be prepared by the construction contractor and approved hy ITD prior to each project implementation. All staging, fueling, and storage areas will be located away from aquatic areas. NMFS believes that fuel spill and equipment leak contingencies and preventions described in the proposed action should be sufficient to minimize the risk of negative impacts to ESA-listed fish and fish habitat from toxic contamination.

2.4.1.4. Habitat-related Effects on Fish

NMFS expects that implementation of the proposed action may adversely affect habitat conditions within the analysis area, affecting habitat suitability for spawning, rearing, and migrating ESA-listed salmonids. Near and in-stream ground disturbance is likely to increase in-channel sediment deposition; and excavation at project sites and installation of riprap or gabion baskets may alter streambank conditions.

Sediment Deposition. The methods for sediment introduction to the stream channel were described in the suspended sediment discussion above. The same suite of conservation measures proposed to reduce the potential for suspended sediment will likewise minimize the potential for in-channel sediment deposition.

The potential effects of sediment deposition on fish habitat, and subsequently on individual fish, are described in the scientific literature and include smothering of redds and spawning gravels, changes to primary and secondary productivity, and reduction of available cover for juveniles. Egg-to-emergence survival and size of alevins is negatively affected by fine sediment intrusion into spawning gravel (Young et al. 1991). Fine sediment deposition in spawning gravel reduces the oxygen supply rate to redds (Wu 2000). However, female salmonids displace fine sediment when they dig redds, cleaning out the gravel and increasing permeability and interstitial flow (Kondolf et al. 1993). Given the small level of sediment likely to be introduced to streams from project activities with proposed sediment control BMPs, the process of digging a redd will likely displace most of this sediment. Furthermore, it is extremely unlikely that redds will be present within any work site during the work period due to tbe proposed instream work windows. Thus sedimentation is not expected to directly affect incubating eggs or alevins.

Fine sediment deposition also has tbe potential to adversely affect primary and secondary productivity (Spence et al. 1996; Suttle et al. 2004). Suttle et al. (2004) found that increases in fine sediment concentration led to a change from aquatic insects available to salmonids (i.e., surface grazers and predators) to unavailable burrowing species. However, due to the conservation measures included in tbe action to minimize sediment delivery to streams, NMFS expects that any effects to primary production will be minimal..

Finally, fine sediment delivery to streams can reduce cover for juvenile salmonids (Bjornn and Reiser 1991). Fine sediment can fill pools as well as interstitial spaces in rocks and gravels used by fish for thermal cover and for predator avoidance (Waters 1995). NMFS expects that juvenile cover will be affected in the short term within the affected individual 1,600 foot stream reaches;

but that habitat quality will then recover as fine sediments are flushed downstream during high flows after project completion. Any loss of habitat that occurs from sediment deposition caused by the proposed action would likely last less than 10 hours and be confined to the project area, and thus would not have any long-term effects on ESA-listed fish. Fish are expected to seek alternate habitat in adjacent areas during this temporary loss of habitat from program-related sediment deposition. Furthermore, NMFS expects that project-related sediments introduced into the stream channel will be a much smaller amount than the annual sediment budget of a watershed, such that sediment impacts from the program will be unmeasureable at the watershed-scale.

Streambank Alteration. Under this program, bank stabilization projects involving riprap, gabion baskets, or MSE walls extending down into the stream channel could alter the habitat value of streambanks, permanently reducing the amount of habitat available for ESA-listed species. Bridge replacement projects under this program may also involve the placement of riprap along streambanks. The placement of riprap, gabion baskets, and MSE walls can cause adverse effects to stream morphology, fish habitat, and fish populations (Schmetterling et al. 2001; Garland et al. 2002). Riprap fails to provide the intricate habitat requirements for all age classes or species that are provided by naturally vegetated banks. Streambanks with riprap often have fewer undercut banks, less low-overhead cover, and are less likely than natural streambanks to deliver large woody debris to streams (Schmetterling et al. 2001). All these effects can simplify habitat and render it less productive for aquatic organisms. Riprap may also reduce stream sinuosity, thereby increasing gradient and potentially causing channel incision and floodplain abandonment where finer substrates are present. Peters et al. (1998, as cited in Schmetterling et al. 2001) reported that salmonid abundance was lower at locations where banks had riprap modifications compared to natural banks.

Under this program, the placement of most riprap or other bank stabilizations will replace or repair existing embankments, thus limiting the net impact on salmonid habitat. Several conservation measures or project design requirements will further limit potential adverse effects on habitat. For bridge replacement projects, no more than 200 cubic yards of riprap can be placed below the OHWM, and the riprap will be placed in a manner that will not further constrict the stream channel from existing conditions. For bank stabilization projects, installation will be limited to the areas identified as most highly erodible, with highest shear stress, or at greatest risk of mass-failure, and will only be acceptable where necessary to prevent failure of a culvert, road, or bridge foundation. For each project, riprap or other bank stabilization structures will extend for no more than 300 linear feet below OHWM. No more than two bank armoring projects per subbasin (4^{th} field HUC) shall be approved annually. Placement of riprap armor will occur in a way that does not significantly constrict the channel or restrict natural hydraulics. The installation of riprap and other bank stabilization structures will negatively impact small amounts of habitat. However, most projects will be in areas with existing armoring treatments and would therefore not have any new adverse effect on habitat.

2.4.2. Effects on Critical Habitat

NMFS designates critical habitat based on physical and biological features that are essential to the ESA-listed species. Essential features for designated critical habitat include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space, and safe passage. The action area provides widespread freshwater spawning, rearing, and migration habitat for Snake River spring/summer Chinook salmon, Snake River fall Chinook, Snake River Basin steelhead, and Snake River sockeye salmon. The critical habitat essential features associated with freshwater spawning, rearing, and migration that may be adversely affected by the action are water quality, substrate/spawning gravel, forage, riparian vegetation, and access.

2.4.2.1. Water Quality.

As described in "Effects of the Action" (Section 2.4), water quality in the action areas may be temporarily degraded due to increased turbidity associated with many of the proposed activities. Conservation measures included in the action will minimize sediment delivery, so NMFS expects that no individual sediment plume would exceed 1,600 feet in length and all sediment plumes would dissipate within a few hours. Therefore, the proposed action should not reduce the conservation values associated with water quality parameters for any streams in the action area, other than temporarily.

2.4.2.2. Substrate/Spawning Gravel

As described in "Effects of the Action" (Section 2.4), temporary pulses of sediment and turbidity plumes are expected to cause small increases in downstream fine sediment deposition and thus negatively affect some substrates in the short term. However, because the amount of deposited fine sediments generated from an individual project will be extremely small, the next high-flow event is likely to wash these fine sediment downstream. Increased surface fines are not likely to persist beyond 6 months. Due to design criteria to avoid redds and limit the sediment introduced and deposited, NMFS expects these temporary increases to be small, especially in comparison to the annual sediment load during peak discharge. Therefore, the proposed action should not reduce the conservation values associated with suhstrate and spawning gravels for any streams in the action area, other than temporarily.

2.4.2.3. Forage

Increases in turbidity and sediment deposition may temporarily reduce macroinvertebrate communities downstream from some project sites. Pile-driving and noise from heavy machinery will temporary alter the levels of hydro-acoustics, altering juvenile Snake River spring/summer Chinook and juvenile Snake River steelhead's ability to utilize forage within the action area. However, the proposed in-stream work windows, de-watered construction sites, and reduced

stream flows associated with the time of year are expected to minimize both the magnitude and duration of downstream effects to salmonid food sources. Thus, the proposed action should have no lasting effect on forage levels.

2.4.2.4. Riparian Vegetation

In instances where riparian shrubs are removed during construction, vegetation will be replanted. Because actions completed under this programmatic consultation will occur on existing state highways, riparian vegetation removal is expected to be minimal and will not reduce the conservation value associated with riparian vegetation for any streams in the action area.

2.4.2.5. Access

For culvert replacements and two-lane bridge replacements requiring de-watering of the entire width of stream channel, upstream and downstream passage for ESA-listed species will temporarily be blocked. Over the long term, however, access would in many cases be improved by culvert replacements, which will be designed to allow fish passage for all fish-bearing streams, thus increasing the extent of usable critical habitat.

2.4.2.6. Floodplain Connectivity

As described above "Effects of the Action" (Section 2.4), the program will include bank stabilization measures, such as riprap emplacement. Excessive riprap may reduce sinuosity, thereby increasing gradient and potentially causing channel incision and floodplain abandonment where finer substrates are present. However, placement of riprap under the program will be designed to avoid significantly constricting the channel (or affecting natural hydraulics), and would thus reduce the potential to affect floodplain connectivity. Most projects will be in areas with existing armoring treatments, and will not create new adverse impacts on habitat.

Implementation of the proposed action is expected to cause some short-term PCE impairment in the action area by temporarily increasing sediment impacts on turbidity levels and substrates. Based on the effects described above, it is reasonably likely that the proposed action will have small, local, negative impacts on the conservation value of critical habitats from the time of individual project completion until the next peak discharge (which would occur less than 10 months after any proposed project is completed)

2.5. Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject

to consultation (50 CFR 402.02). 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.

Between 2000 and 2010, the cumulative population in the nine central Idaho counties with anadromous fish and state highways increased by 5.8%[8]. NMFS therefore assumes that future private and state actions will continue within the action area with a slight increase from their current rate. Seventy-one percent of the action area is Federally-owned, which somewhat limits possible cumulative effects from private and state actions. However, private land is often clustered in valley bottoms, adjacent to occupied habitat for ESA-listed species. Due to the large, diverse landscape encompassed by this programmatic action, it is difficult to predict with any certainty the effects of future state and private actions.

NMFS is aware of several potential future state and private actions in the action area that may benefit ESA-listed species. The *Draft Recovery Plan for Idaho Snake River Spring/Summer Chinook and Steelhead*, currently posted online at http://www.idahosalmonrecovery.net for informal public comment, recommends habitat restoration projects on private lands throughout the action area (NMFS 2011a-e). Idaho Department of Lands is developing the proposed Idaho Forestry Program, which aims to reduce the impacts of state and private forestry on stream habitat through road maintenance and stream buffer measures (IDL 2008). The state of Idaho is also negotiating with NMFS on measures to reduce the impacts of water withdrawals on stream habitat in watersheds in the Salmon River.

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; or (2) reduce the value of designated or proposed critical habitat for the conservation of the species. These assessments are made in full consideration of the status of the species and critical habitat (Section 2.2).

As described above, NMFS recently concluded that all four ESA-listed anadromous fish species in the action area remain threatened with extinction or, in the case of sockeye, are endangered (Ford et al. 2011). Degraded spawning, rearing, and migration habitat in Idaho is a limiting factor for each species. The proposed action will kill individual fish and further impact currently degraded habitat. These effects may in turn affect the attributes of a viable salmonid population (levels of abundance, productivity, spatial structure, and diversity). However, the number of juvenile fish likely to be killed will be small, and adverse effects on habitat are also likely to be small, localized, and brief enough that population attributes are not likely to be affected.

[8] http://quickfacts.census.gov/qfd/states/16000.html, accessed March 23, 2012.

Effects on individual fish include handling and exposure to turbidity and sediment. The primary effect on individual fish from the proposed action is the possibility of injury or death from fish handling, primarily electrofishing. Electrofishing and the other fish handling procedures are included in the action specifically in order to reduce the potential for harm, injury, or death to ESA-listed fish, but these protocols will nonetheless kill or injure a small number of individuals. No fall Chinook or sockeye salmon will be killed because these species will not be present at electrofishing sites. The estimated 65 juvenile spring/summer Chinook and 35 juvenile steelhead that may be killed through fish handling per year translate to 0.02 fewer returning Chinook adults and 0.01 fewer returning steelhead adults per year for each population in the action area. Furthermore, NMFS expects these fractions to be far lower in most years because there will be fewer than the maximum of 46 projects requiring fish handling in most years.

NMFS does not consider the potential loss of a small fraction of one adult steelhead and one adult spring/summer Chinook salmon from 1 year class a significant reduction in abundance for any population of either species, given current population abundance. The ICTRT estimates current abundance for Idaho steelhead populations to range from 345 to 556 adult spawners per year (NMFS 2011d). Ford et al. (2011) estimate that current abundance for spring/summer Chinook populations with state highways (those highlighted in Table 4 above) ranges for 21 to 331 adult spawners per year. The population with a current mean abundance of just 21 spawners is the Yankee Fork. The only stretch of state highway in this population is where the Salmon River road crosses the Yankee Fork at its confluence with the Salmon River. Thus the Yankee Fork population is not likely to have any projects in most or even all of the 10 years of this program. The spring/summer Chinook population with the next lowest current abundance is Valley Creek, with a mean of 78 spawners per year. The loss of 0.01 to 0.02 adult fish per year is not large enough to impacts steelhead and spring/summer Chinook populations at their current abundances.

The second effect of the action will be to expose fish to small amounts of turbidity and sediment. At individual project sites, the proposed action will cause water quality degradation in the short term (portions of 1 day) through temporary turbidity increases affecting up to 1,600 feet downstream from channel or riparian disturbances caused by program activities. Juveniles within 1,600 feet are likely to migrate out of the most turbid waters thereby avoiding the highest levels of sublethal effects. Sediment-related impacts are not expected to cause mortality or create long-term reduction of critical habitat value. Instream work windows are designed to avoid impacts on spawning adults or redds. Water quality will not be affected in the long term because construction effects are brief and localized. NMFS expects that sediment and turbidity exposure will have a very small effect on the abundance and productivity of individual populations in the action area, given the small extent of the sediment-related project effects in comparison to total miles of habitat for each population. The effects of the action are therefore not likely to affect the attributes of a viable salmonid population and hence not likely to reduce the viability of any MPG, the three salmon ESUs, or the steelhead DPS.

2.7. Conclusion

After reviewing the current status of the listed species and their designated critical habitat, the environmental baseline within the action area, the effects of the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of Snake River spring/summer Chinook, Snake River fall Chinook, Snake River sockeye, and Snake River Basin steelhead, or to destroy or adversely modify their designated critical habitat.

2.8. Incidental Take Statement

Section 9 of the ESA and Federal regulation 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 results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. For purposes of this consultation, we interpret "harass" to mean an intentional or negligent action that has the potential to injure an animal or disrupt its normal behaviors to a point where such behaviors are abandoned or significantly altered.[9] 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.

2.8.1. Amount or Extent of Take

The proposed action is reasonably certain to result in incidental lethal and non-lethal take of juvenile steelhead and spring/summer Chinook salmon, and non-lethal take of fall Chinook salmon. NMFS is reasonably certain that the lethal and non-lethal incidental take described here for steelhead and spring/summer Chinook will occur because: (1) Juvenile Snake River Basin steelhead and spring/summer Chinook salmon are known to occur in the action area during the proposed work windows; (2) some projects included in the proposed action are likely to capture, handle, and kill individuals through salvage operations including electrofishing; and (3) projects that include in-channel work may generate turbidity that could extend up to 1,600 feet downstream from the work site. NMFS is reasonably certain that the non-lethal incidental take described here for fall Chinook will occur because: (1) Juvenile Snake River

[9] NMFS has not adopted a regulatory definition of harassment under the ESA. The World English Dictionary defines harass as "to trouble, torment, or confuse by continual persistent attacks, questions, etc." The USFWS defines "harass" in its regulations as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3). The interpretation NMFS adopts in this consultation is consistent with our understanding of the dictionary definition of harass and is consistent with the USFWS interpretation of the term.

fall Chinook salmon are known to occur in the action area during the proposed work windows; and (2) projects that include in-channel work may generate turbidity that could extend up to 1,600 feet downstream from the work site. Fall Chinook are not likely to be present at project sites requiring fish handling, and therefore are not likely to experience lethal take.

Take caused by altered habitat conditions cannot be accurately quantified as a number of fish likely to be harmed. This is because the relationship between habitat-related effects and the distribution and abundance of fish in the action area is imprecisely known, and therefore we cannot predict how many individual fish might be taken. In such circumstances, we use the causal link established between the activity and a change in habitat conditions affecting the species to describe the extent of take. In this case, the extent of take will be described as the extent of turbidity caused by the proposed action. The extent of take will thus be exceeded if turbidity is visible above background levels at 1,600 feet downstream of the instream work. Background turbidity levels should be observed at least 200 feet upstream from the proposed work site.

We can, however, quantify the number of fish that may be taken during fish salvage activities. Fish salvage will occur at an estimated maximum of 46 sites per year, affecting an average of 5,000 square feet of habitat at bridge replacement sites and 1,040 square feet at all other project sites. Given those figures, we expect that no more than 430 juvenile steelhead and 788 spring/summer run Chinook will be captured, handled, or stranded per year during salvage activities. Based on available scientific literature, NMFS expects that approximately three of these steelhead and six of these Chinook per year will die from electrofishing; that an additional 32 steelhead and 59 Chinook will die per year from stranding; and that 16 steelhead and 30 Chinook will be injured per year. The extent of take will be exceeded if take is greater than any of these figures. We do not anticipate that the activities would take any adult Chinook salmon and steelhead or their incubating eggs. Nor do we anticipate that any fall Chinook or sockeye salmon would he taken at all.

The extent of turbidity, the estimated numbers for juvenile steelhead and spring/summer Chinook salmon to be captured during stream de-watering, and the numbers of steelhead and spring/summer Chinook salmon killed are separate thresholds for reinitiating consultation. Exceeding any of these limits will trigger the reinitiation provisions of this Opinion.

2.8.2. Reasonable and Prudent Measures (RPMs) and Terms and Conditions

The RPMs are nondiscretionary measures to minimize the amount or extent of incidental take (50 CFR 402.02). "Terms and conditions" implement the RPMs (50 CFR 402.14). These must be carried out for the exemption in section 7(o)(2) to apply.

The FHWA and COE shall:

1. Avoid and minimize take of ESA-listed fish by reducing all adverse effects associated with state highway maintenance activities.

2. Develop and complete a monitoring and reporting program to confirm that the conservation measures for the action effectively avoid and minimize the impacts of incidental take caused by the permitted activities and that the extent of take is not exceeded.

2.8.2.1. Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the FHWA, COE, and their cooperators, including ITD, 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. Partial compliance with these terms and conditions may invalidate this take exemption, result in more take than anticipated, and lead NMFS to a different conclusion regarding whether the proposed action will result in jeopardy or the destruction or adverse modification of designated critical habitats.

1. To implement RPM #1 (minimize take), the FHWA and COE shall ensure that:

   a. When a culvert is replaced in a fish-bearing stream, the culvert will be designed to pass 50-year storm event flows.

   b. All electrofishing will follow NMFS' guidelines described in NMFS (2000).

   c. 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.

   d. When reducing flow during the de-watering phase, rapidly remove approximately 80% of streamflow to encourage the greatest degree of volitional movement from the project site.

   e. Ensure that holding conditions for any transported fish provide the lowest level of stress to captured individuals by maintaining local stream conditions (e.g., temperature, dissolved oxygen, etc.) in holding tanks, minimizing holding time, and preventing any predation in holding vessels.

   f. Release all transported fish to a safe location as quickly as possible. Releasing fish upstream from the project site is better in that it avoids subjecting the fish to project-related sediment impacts.

   g. All impact pile driving conducted under the proposed action will be conducted on dry ground.

   h. The only in-water pile driving conducted under the Opinion shall be the use of vibratory hammers to drive sheet pile.

i. If riparian vegetation is disturbed, an equal or greater amount will be restored.

j. Sediment retention structures will be monitored over the course of each project, and structures will be cleaned out by hand when the structures are two-thirds full.

2. To implement RPM #2 (monitoring), the FHWA and COE shall ensure that:

a. All captured, handled, and killed ESA-listed fish shall be identified, counted, and reported to NMFS using the Construction Monitoring Form (Appendix B of this Opinion), indicating the method of capture and cause of death.

b. Visual monitoring shall be conducted to confirm that the extent of take (1,600 foot sediment plume) is not exceeded. Turbidity monitoring will also include NTU measurements to ensure that a sediment plume does not exceed state water quality standards for turbidity at any point. Idaho surface water quality criteria for aquatic life use designations require that below an applicable mixing zone, turbidity shall not exceed background turbidity by more than 50 NTU instantaneously or more than 25 NTU for more than 10 consecutive days. Written confirmation of turbidity monitoring results shall be included on the Construction Monitoring Form.

c. A post-project report (Construction Monitoring Form, Appendix B) will be submitted to NMFS within 45 days of project completion.

d. Submit post-project reports to:

Idaho State Director
Habitat Conservation Division
National Marine Fisheries Service
Attn: 2010/01122
10095 W Emerald St.
Boise, Idaho 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 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). The following recommendations are discretionary measures that NMFS believes are consistent with this obligation and therefore should be carried out by the FHWA and COE:

1. 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, mainstem, and estuarine habitat measures; as well as protective hydropower mitigation measures. In particular, protect and restore riparian buffers, wetlands, and floodplains; remove stream barriers; and ensure late summer and fall tributary streamflows.

2. Minimize the use of riprap and other bank stabilization measures. Offset any impacts to stream habitat below the OHWM with streambank restoration projects along stretches of streams or rivers with ESA-listed species and adjacent to state highways.

2.10. Reinitiation of Consultation

As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action on listed species or designated critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect on the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

2.11. "Not Likely to Adversely Affect" Determinations

As noted in Table 1, the FHWA and COE determined that many of the categories of activities included in the proposed action are "not likely to adversely affect" ESA-listed anadromous fish species or their designated critical habitat. NMFS concurs with this determination, primarily because these activities do not involve any work within stream channels. However, many

projects will be located adjacent to streams since state highways frequently cross or run parallel to streams and rivers. Such projects have the potential to impact riparian vegetation, deliver sediment to streams, decrease streambank stability, and increase the risk of chemical contamination. Nonetheless, we have determined that all such effects on ESA-listed species and their habitat will be insignificant or discountable for the following reasons.

2.11.1. Riparian Vegetation

The "NLAA" projects listed in Table 1 will have little or no ground disturbance in riparian areas, and streamhank disturbance will be kept to insignificant levels, due to the fact that the projects would generally be located within the existing state highway right-of-ways, and to conservation measures incorporated into every project design. That is, any riparian vegetation that is disturbed will be re-seeded or re-planted with appropriate species. Also, landscaping plans will be prepared for each project that specifies retaining as much existing vegetation as possible and state how to properly care for vegetation during and after construction. Vegetation to be preserved during project activity will be clearly marked, flagged, or fenced. Due to the temporary nature and small spatial extent of these potential disturbances to riparian areas, such projects will have an insignificant effect on riparian vegetation.

2.11.2. Sediment

Although the NLAA projects in Table 1 will involve ground disturbance, which can lead to erosion of fine sediments, no disturbance will occur in stream channels or on streamhanks below the OHWM. Project activity will largely occur within existing road right-of-ways. Fiber wattles and/or silt fences will be placed adjacent to or below disturbance areas to minimize sediment transport into any waterway. Sediment delivery to streams will be insignificant due to the erosion control measures that are required.

2.11.3. Streambank Stability

The NLAA projects in Table 1 will not involve disturbance to streambanks below the OHWM, helow which bank stability is most important for streambank function. In some cases, small amounts of streambank above the OHWM could be disturbed by these actions. Because of the small scale of such disturbances and because removal of riparian vegetation will be minimized and disturbed areas will immediately be re-seeded or re-planted, reductions in streambank stability will be insignificant.

2.11.4. Temperature

Stream temperatures are influenced by the shade provided by riparian vegetation. Small amounts of riparian vegetation could be removed by NLAA projects in Table 1; but any riparian vegetation that is disturbed will be re-seeded or re-planted. For each project, landscaping plans

will be prepared which include retaining as much existing vegetation as possible and state proper care of vegetation during and after construction. Vegetation to be preserved during project activity will he clearly marked, flagged, or fenced. Temperature impacts are therefore likely to he insignificant.

2.11.5. Chemical Contamination

Chemical contamination from equipment leaks or spills from NLAA projects in Table 1 is discountable due to the strict preventative measures proposed for project implementation. To minimize the potential for introducing hazardous material to the aquatic system, a spill prevention and control countermeasures plan will be prepared by the construction contractor and approved by ITD prior to project implementation. Equipment shall not have damaged hoses, fittings, lines, or tanks that have the potential to release pollutants into any waterway. Spill kits and cleanup materials shall be available at all locations during operations. Equipment will be parked over plastic sheeting or equivalent where possible; although plastic will not be a substitute for drip pans or absorhent pads. All staging, fueling, and storage areas for equipment will be located away and adequately huffered from aquatic areas. For these projects, machinery will not operate below the OHWM.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The consultation requirement of section 305(b) of the 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 EFH-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 groundfish (PFMC 1998a), coastal pelagic species (PFMC 1998b), and Chinook salmon, coho salmon, and Puget Sound pink salmon (PFMC 1999). The proposed action and action area for this consultation are described in the Introduction to this document. The action area includes areas designated as EFH for various life-history stages of Snake River spring/summer Chinook salmon and Snake River fall Chinook salmon, and coho salmon. The effects of the proposed action on EFH are largely related to the minor water quality related effects due to temporary increases in turbidity and localized sediment deposition.

3.1. EFH Conservation Recommendations

NMFS believes that the implementation of the terms and conditions provided in the ESA consultation above are adequate to ensure conservation of EFH within the action area. NMFS believes that the following conservation measures are necessary to avoid, mitigate, or offset the impact of the proposed action on EFH. These conservation recommendations are a non-identical set of the set of the ESA terms and conditions.

1. When a culvert is replaced in a fish-bearing stream, the culvert should be designed to pass 50-year storm event flows.

2. If riparian vegetation is disturbed, an equal or greater amount will be restored.

3. Sediment retention structures will be monitored over the course of each project, and structures will he cleaned out by hand when the structures are two-thirds full.

4. Visual monitoring shall be conducted to confirm that the extent of take (1,600 foot sediment plume) is not exceeded. Turbidity monitoring will also include NTU measurements to ensure that a sediment plume does not exceed state water quality standards for turbidity at any point. Idaho surface water quality criteria for aquatic life use designations require that helow an applicable mixing zone, turbidity shall not exceed hackground turbidity by more than 50 NTU instantaneously or more than 25 NTU for more than 10 consecutive days. Written confirmation of turbidity monitoring results shall be included on the Construction Monitoring Form.

3.2. Statutory Response Requirement

Federal agencies are required to provide a detailed written response to NMFS' EFH conservation recommendations within 30 days of receipt of these recommendations [50 CFR 600.920(k)(1)]. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse affects of the activity on EFH. If the response is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations. The reasons must include the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

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, in your statutory reply to the EFH portion of this consultation, we ask that you clearly identify the number of conservation recommendations accepted.

3.3. Supplemental Consultation

The FHWA 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)(1)].

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 consultation concludes that the proposed funding or permitting of routine maintenance activities on state highways will not jeopardize the affected ESA-listed species. Therefore, the FHWA and COE can carry out this action in accordance with their authority under Title 23, United States Code, Highways, and section 404 of the CWA, respectively. The intended users are the FHWA, COE, and ITD.

Individual copies were provided to the above-listed entities. This consultation will be posted on 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 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 Notification Form

ITD 0289 (Rev. 04-10)
itd.idaho.gov

Programmatic Biological Assessment
Project Pre-notification
Idaho Transportation Department

Key Number	Project Number	Project Name		
District	Decimal Degrees Latitude Longitude	Construction Timeframe	Water Body Name	4th Code HUC Number
ITD Project Manager Name		Completed By		Date

Project Categories (check all that apply)

Seal Coat, Tack Coat and Prime Coat	☐	Passing Lanes, Turnbays, Slow Moving Vehicle Turnouts	☐
Plant Mix Overlay	☐	Pavement Widening (Sliver Shoulder Notch)	☐
Cement Recycled Asphalt Base Stabilization (CRABS)	☐	Bank Stabilization (Rip-rap)	☐
Cold In-Place Recycle (CIR)	☐	Bank Stabilization (Gabion Basket)	☐
Bridge Deck Hydro-Demolition	☐	Mechanically Stabilized Earth Embankment (MSE Wall)	☐
Silica Fume and Latex Modified Concrete Overlay	☐	Ditch Cleaning	☐
High Molecular Weight Methacrylate Seal (HMWM)	☐	Small Structure Repair	☐
Concrete Waterproofing Systems (Membrane Type A, B, C and D)	☐	Culvert Installation (New Culverts and Replace Existing Culverts)	☐
Bridge Deck Epoxy Ship Seal	☐	Culvert Extension	☐
Two-lane Bridge Construction	☐	Culvert Maintenance	☐
Excavation and Embankment for Roadway Construction (Earthwork)	☐	Guardrail Installation	☐
Rock Scaling	☐	Striping (methyl methacrylate or paint)	☐
		Geotechnical Drilling	☐

Project Description (Start and End Date, Work Windows, Dewatering, etc.)

List Project Specific BMPs

ESA Listed Species Potentially Affected

ESA Listed Species With Possibility of Take

	Yes	No
Does the project have a federal nexus?	☐	☐
ESA listed plant survey required? (attach documentation)	☐	☐
ESA listed snail survey required? (attach documentation)	☐	☐
Culvert Projects: Is providing fish passage necessary?	☐	☐

	Yes	No
Electro-Shocking Proposed?	☐	☐
If Yes, will fish be handled?	☐	☐
If Yes, will fish be killed?	☐	☐
If No, will fish be harmed or harassed?	☐	☐
Is NTU monitoring proposed? (Extent of Take monitoring)	☐	☐

Signature of DE, ADE, DMTCE, or RE	Date

Programmatic Biological Assessment
Project Pre-notification

Project Images - Click in a square to insert a project image; insert only one project image in each square. If necessary, resize picture to no more than 2.5" x 2.5".

Programmatic Biological Assessment
Project Pre-notification

Insert a copy of the project area map in the box; resize map as needed.

Distribute Within 45 Days To: NMFS FWS FHWA COE ITD HQ Environmental Section Manager

Appendix B. Construction Monitoring Form

ITD 0290 (Rev. 04-10)
itd.idaho.gov

Programmatic Biological Assessment
Construction Monitoring
Idaho Transportation Department

Key Number	Project Number	Project Name		
District	**Decimal Degrees** Latitude Longitude	**Construction Timeframe**	**Water Body Name**	**4th Code HUC Number**
Completed By			**Date**	

Project Categories (check all that apply)

Seal Coat, Tack Coat and Prime Coat	☐	Passing Lanes, Turnbays, Slow Moving Vehicle Turnouts	☐
Plant Mix Overlay	☐	Pavement Widening (Sliver Shoulder Notch)	☐
Cement Recycled Asphalt Base Stabilization (CRABS)	☐	Bank Stabilization (Rip-rap)	☐
Cold In-Place Recycle (CIR)	☐	Bank Stabilization (Gabion Basket)	☐
Bridge Deck Hydro-Demolition	☐	Mechanically Stabilized Earth Embankment (MSE Wall)	☐
Silica Fume and Latex Modified Concrete Overlay	☐	Ditch Cleaning	☐
High Molecular Weight Methacrylate Seal (HMWM)	☐	Small Structure Repair	☐
Concrete Waterproofing Systems (Membrane Type A, B, C and D)	☐	Culvert Installation (New Culverts and Replace Existing Culverts)	☐
Bridge Deck Epoxy Ship Seal	☐	Culvert Extension	☐
Two-lane Bridge Construction	☐	Culvert Maintenance	☐
Excavation and Embankment for Roadway Construction (Earthwork)	☐	Guardrail Installation	☐
Rock Scaling	☐	Striping (methyl methacrylate or paint)	☐
		Geotechnical Drilling	☐

	Yes	No
BMPs are constructed and monitored	☐	☐
Storm Water Pollution Prevention Plan (SWPPP) is prepared	☐	☐
Erosion and sediment control plan is prepared	☐	☐
Chemical contamination measures are in place	☐	☐
Were fish taken during project construction?	☐	☐
Were fish killed during project construction?	☐	☐

Number of Fish Handled During Project Construction
Species of Fish
Length of Stream Channel Hardened (if applicable)

NTU Monitoring

Date								
Reading								

NTU Monitoring Comments

Comments Regarding Species Documentation or Project Implementation

Signature of DE, ADE, DMTCE, or RE	Date

Programmatic Biological Assessment
Construction Monitoring

Project Images - Click in a square to insert a project image; insert only one project image in each square. If necessary, resize picture to no more than 2.5" x 2.5".

Distribute Within 45 Days To: NMFS FWS FHWA COE ITD HQ Environmental Section Manager