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COVER SHEET

Public Review Draft – June 2005

- Title of Environmental Review:** Environmental Assessment of a National Marine Fisheries Service (NMFS) Action to Issue Direct Take Permit 1530 to the Washington Department of Fish and Wildlife (WDFW), Idaho Department of Fish and Game (IDFG) and Bureau of Indian Affairs (BIA) under Section 10(a)(1)(A) of the Endangered Species Act
- Evolutionarily Significant Units:** Snake River Spring/Summer Chinook Salmon, Snake River Fall Chinook Salmon, Snake River Sockeye Salmon, and Snake River Steelhead
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- Legal Mandate:** Endangered Species Act of 1973, as amended and implemented –
50 FR Part 223
- Location of Proposed Activities:** Washington, Snake River Basin
- Activity Considered:** NMFS' action of issuing a permit to WDFW, IDFG, and BIA for the Direct take of ESA-listed anadromous fish under the jurisdiction of NMFS associated with operation of the Lower Granite Dam fish trap for fall Chinook broodstock collection and run reconstruction and steelhead run monitoring.

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1.0 Purpose Of and Need for the Proposed Action

1.1 Background

NOAA's National Marine Fisheries Service (NMFS) is the lead agency responsible for administering the ESA as it relates to listed salmon and steelhead. Actions which may affect listed species are reviewed by NMFS under section 7, section 10 of the ESA, or under section 4(d), which can be used to limit the take prohibition under section 9. Under section 10(a)(1)(A) of the Endangered Species Act (ESA), non-Federal entities may apply for permits from NMFS to take ESA-listed species under the jurisdiction of NMFS if such taking is for scientific purposes or to enhance the propagation or survival of the affected species. The action considered in this Environmental Assessment is the issuance of a section 10(a)(1)(A) permit.

On March 23, 2005, the Washington Department of Fish and Wildlife (WDFW), Idaho Department of Fish and Game (IDFG) and Bureau of Indian Affairs (BIA) submitted a section 10(a)(1)(A) permit application titled "Application for a Section 10(a)(1)(A) Permit to Conduct Research and Broodstock Collection on Snake River Fall Chinook, and Research on Snake River Summer Steelhead at/above Lower Granite Dam to enhance the propagation and survival of these threatened ESUs" (WDFW et al. 2005). The Washington Department of Fish and Wildlife (WDFW), in cooperation with Idaho Department of Fish and Game (IDFG) and Nez Perce Tribe propose to collect biological samples and select broodstock from adult fall Chinook salmon (*Oncorhynchus tshawytscha*) that are trapped at Lower Granite Dam on the Lower Snake River. The applicants also propose to collect biological samples from steelhead (*O. mykiss*) that are trapped concurrently with fall Chinook.

NMFS seeks to consider, through NEPA analysis, the effects of the pending action on the natural and physical environment and the relationship of people with that environment. NMFS is also required to review compliance of ESA actions with other applicable laws and regulations. The NEPA analysis provides an opportunity to consider, for example, how the action may affect conservation of non-listed species, socioeconomic objectives that seek to balance conservation with wise use of affected resources and other legal and policy mandates. Of particular concern is whether pending actions are consistent with tribal treaties and the associated Federal treaty trust responsibilities. The United States has a unique relationship with tribal governments as set forth in the Constitution, treaties, statutes, and Executive orders. This body of statutes, treaties, and policies, together with Federal court rulings that interpret them, is commonly spoken of as "Treaty Trust Doctrine." As stated in Secretarial Order 3206 ("American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act"), NMFS is "... to ensure that Indian Tribes do not bear a disproportionate burden for the conservation of listed species"

With regard to fisheries and resource management, the Secretarial Order encourages development of cooperative relationships with the Tribes, the creation of government-to-government partnerships, and cooperative assistance to intertribal organizations to carry out resource management responsibilities.

1.2 Description of the Proposed Action

NMFS proposes to issue an ESA section 10(a)(1)(A) direct take permit 1530 to WDFW, IDFG, and BIA for collection of fall Chinook broodstock, and collecting biological samples from fall Chinook and steelhead, and related research and monitoring activities associated with the operation of the fish trap located in the Lower Granite Dam fish ladder. The applicants propose to continue to operate trap and holding facilities for the collection of listed Snake River fall Chinook salmon adults to enhance the propagation and conduct research on this listed species of salmon and to trap and collect biological samples from summer steelhead.

Two alternatives are considered in this EA; (1) NMFS does not issue a section 10 permit for the proposed activities, (2) NMFS issues a section 10 permit for the proposed activities with conditions. Other alternatives were considered but rejected as unrealistic.

The proposed actions are expected to primarily affect threatened Snake River fall Chinook salmon and threatened Snake River summer steelhead listed under the ESA. However, endangered Snake River sockeye salmon and Snake River spring/summer Chinook and may be present in some of the waters that are affected by the permitted activities.

1.3 Purpose Of and Need for the Action

The purpose of the proposed action is to conduct monitoring and research on the status of Chinook and steelhead populations, evaluate the relative reproductive success of hatchery-origin and natural-origin fall Chinook, and collect broodstock to support artificial propagation for mitigation, and research purposes in a manner that will enhance the propagation and survival of the listed population. The artificial propagation program would be consistent with, and would take place within the greater context of regional and subbasin salmon recovery plans. In addition to helping restore viable, naturally-reproducing populations of Chinook salmon, the artificial propagation program is designed to contribute to meeting tribal trust responsibilities, providing salmon for tribal ceremonial and subsistence needs, and providing recreational fishery opportunities as specified in mitigation agreements. In this context, the need for the proposed action is to enhance the propagation and survival of the ESA-listed natural populations and to apply scientific fishery management protocols as part of the overall conservation of listed species. Conservation needs of the target populations are addressed while developing resources to support sustainable tribal and recreational fisheries consistent with Treaty trust responsibility and state and Federal statutes and policies.

1.4 Action Area

The action area is primarily at Lower Granite Dam, located on the Lower Snake River, in Washington state, and portions of the Snake and Grande Ronde Rivers upstream of Lower Granite Dam. However, all anadromous fish migrating to and from the Snake River Basin must pass through Lower Granite Dam on their migration routes between the upstream spawning and rearing areas and the Pacific Ocean, some 430 miles downstream. The Snake River Basin includes 695,000 square miles in six states. The Snake River is the largest tributary to the

Columbia River and historically was the most important tributary producing anadromous fish in the entire Columbia Basin (NMFS 1995). The Snake River is estimated to have produced between 39 and 45 percent of all Columbia River spring and summer Chinook, 55 percent of summer steelhead and substantial numbers of fall Chinook, sockeye, and coho salmon.

1.5 Scope of the Action

The scope of the action considered here includes the collection of biological samples, monitoring and evaluating the status of anadromous fish populations passing through the fish ladder, broodstock collection to support artificial propagation of Snake River fall Chinook salmon at Lyons Ferry and Nez Perce tribal fish hatcheries, and collecting biological samples from spawned out fall Chinook carcasses upstream of the dam. The proposed activities will provide information essential to the management of returning anadromous fish within the Snake River Basin and in particular, the Snake River fall Chinook ESU and the natural component of the Snake River steelhead ESU.

1.6 Relationship to Other Plans and Policies

The Proposed Action analyzed in this EA relates to other plans and policies regarding the development, management and restoration of anadromous fish resources in the Pacific Northwest and Columbia River Basin.

The 2000 Biological Opinion on the Federal Columbia River Power System (FCRPS) requires the development and implementation of a coordinated monitoring and evaluation program (NMFS 2000). Subsequently, there have been numerous administrative and scientific calls for a comprehensive monitoring and evaluation program to provide consistent, region-wide information about the status of salmon populations and their response to management actions (Botkin *et al.* 2000; ISAB 2001). The run-monitoring portion of the action covered by this consultation is a small component of the larger comprehensive monitoring plan.

The Northwest Power Planning Council (NPPC) identified supplementation as a high priority to achieve its interim goal of doubling anadromous fish runs in the Columbia Basin. The development and evaluation of the fall Chinook propagation program at Lyons Ferry and Nez Perce tribal hatcheries relates directly to basinwide needs and concerns addressed in the Columbia Basin Fish and Wildlife Program (NPPC 2000). Section 206(b)(1)(D) mandates research to assess the potential of supplementation to increase natural production. Section 204(D) stresses the importance of evaluating genetic and ecological effects from outplanting hatchery fish on natural populations. The need to address supplementation questions for upriver stocks is specified in Section 703(h)(1). Section 7 of the Columbia River Basin Fish and Wildlife Program "*calls for immediate efforts to gather data on wild and naturally spawning stocks, review impacts of the existing hatchery system and coordinate supplementation activities.*" In an attempt to "*develop a clear policy to guide the use of supplementation,*" section 7.3B.2 specifically outlines the need to "*implement the high priority supplementation projects including design, construction, operation, maintenance, monitoring and evaluation.*"

The Lower Snake River Fish and Wildlife Compensation Plan was authorized by the Water Resources Development Act of 1976 to compensate for fish and wildlife resource losses in Oregon, Washington and Idaho caused by the construction of the four Lower Snake River dams. The Lyons Ferry Hatchery (LFH) was constructed and is operated as part of this program to mitigate for anadromous fish losses. The Bonneville Power Administration funds the program by the sale of electricity generated by dams on the Columbia and Snake Rivers.

The Hells Canyon Settlement Agreement of 1980 with the Idaho Power Company provides for mitigation of lost fish and wildlife resources caused by construction of Hells Canyon Dam. The Lyons Ferry broodstock provides fall Chinook eggs to the Oxbow hatchery which is operated by IDFG with funding provided by Idaho Power to mitigate for the impacts of Hells Canyon Dam.

The broodstock collection action is designed to support hatchery programs at Lyons Ferry and Nez Perce tribal fish hatcheries. Artificial production of Snake River fall Chinook began in 1976 by trapping adult Snake River fall Chinook at Snake River Dams and implementing an egg bank program at Kalama Falls hatchery in the Lower Columbia River. This action continued until Lyons Ferry hatchery was completed in 1984. Once on-line, LFH began receiving fall Chinook transported from Ice Harbor Dam as well as fish trapped on-site at LFH. Snake River fall Chinook were ESA-listed as a threatened species in 1992. It has been formally documented in NMFS' 1999 Biological Opinion on Artificial Propagation in the Columbia River Basin (NMFS 1999) that the LFH fall Chinook program is for Snake River fall Chinook, and is intended to provide fish for mitigation, compensation, natural production (recovery above LGR Dam), and tribal trust responsibilities. Hatchery and Genetic Management Plans were developed for LFH and the Nez Perce tribal hatchery and submitted to NOAA Fisheries along with a Programmatic Biological Assessment of the Lower Snake River Compensation Plan Program on February 7, 2003.

The permit application and this analysis evaluate the impacts of the proposed action against the standards described in NMFS "Viable Salmonid Populations" paper, which provides guidelines for judging impacts on the abundance, productivity, diversity and distribution of salmonid populations (McElhaney et al 2000). Population descriptions and preliminary abundance levels provided in the latest "Guidelines for Population-level Abundance, Productivity, Spatial Structure, and Diversity Supporting Viable Salmonid Populations" as provided by NMFS Interior Columbia Basin Technical Recovery Team (ICBTRT 2004) are used to describe the populations and evaluate the effects of the proposed actions.

The Proposed Action is consistent with on-going ESA recovery planning. Recovery plans are being developed in most subbasins in the Columbia River system. NMFS has formed an Interior Columbia Basin Technical Recovery Team (TRT) whose primary tasks are to identify population/ESU delisting criteria, characterize habitat/fish productivity relationships, identify factors for decline and limiting factors, identify actions for recovery, identify research, monitoring, and evaluation needs, and serve as science advisors to groups charged with developing measures to achieve recovery goals. NMFS will use the TRT along with policy input, existing science teams, and state, local, regional, tribal, and private entities to develop a final recovery plan to provide a framework for addressing problems across each ESU.

The Northwest Power Planning Council (NPPC) has adopted subbasin plans as a part of the NPPC's 2000 Columbia River Basin Fish and Wildlife Program. Subbasin plans will help direct Bonneville Power Administration (BPA) funding of projects that protect, mitigate, and enhance fish and wildlife that have been adversely impacted by the development and operation of the Federal Columbia River Power System (FCRPS). The NPPC, BPA, NMFS, and FWS intend to use the subbasin plans to meet the RPA's of the 2000 FCRPS biological opinion and for recovery planning at the subbasin level.

2.0 Alternatives Including the Proposed Action

The proposed action and an alternative considered in this EA are: (1) no action (i.e., no permit issued) and, (2) to issue a section 10(a)(1)(A) permit with conditions that specifically address measures to limit the take of listed species and manage the risks which may occur. The following summary describes major aspects of the proposed action and alternatives.

2.1 No Action Alternative - Issue No Permits

Under the No Action alternative, NMFS would not issue a ESA section 10(a)(1)(A) permit authorizing direct take of ESA-listed species for the broodstock collection operations that are designed to enhance the propagation and survival of the listed Snake River fall Chinook; nor allow the run monitoring and reproductive success studies related to the sampling of fall Chinook salmon and steelhead at Lower Granite Dam. This alternative would effectively prohibit the broodstock collection for mitigation and supplementation, and eliminate the run monitoring and relative reproductive success research programs addressing the listed anadromous salmonids.

2.2 Alternative 2 (Proposed Action) - Issue Permits

The proposed action is to issue a permit under section 10(a)(1)(A) of the ESA based on the application, including attachments, submitted by WDFW, IDFG, and BIA, as modified by the conditions that NMFS may require as being necessary and appropriate. The application, including the Research Plan for the relative reproductive success study adopts risk-averse protocols, incorporates current science on fish culture, genetic impacts of artificial propagation, and fishery management that minimizes risks to listed species. This alternative includes measures for evaluation of the impacts of hatchery-origin returns to the propagation program and the interactions between hatchery- and natural-origin fish. NMFS' conditions would ensure that the direct take of ESA-listed anadromous fish would be for the research, propagation and enhancement of the listed populations. Hatchery programs would be permitted to enhance the propagation and survival of the target populations. NMFS' conditions would also ensure that the incidental takes of ESA-listed anadromous fish would not appreciably reduce the likelihood of the survival and recovery of the species in the wild.

The Washington Department of Fish and Wildlife (WDFW), in cooperation with Idaho Department of Fish and Game (IDFG) and Nez Perce Tribe propose to collect biological samples

and select fall Chinook broodstock from the adult steelhead and salmon that are trapped at Lower Granite Dam on the Lower Snake River. The fish trap is located in the fish ladder at Lower Granite Dam, a U.S. Army Corps of Engineers dam constructed on the Lower Snake River for hydroelectric generation and navigation. The trap is operated by personnel of the National Marine Fisheries Service, Northwest Science Center, for a variety of research and management purposes.

Managing the hatchery broodstock for mitigation and restoration purposes is high priority for the applicants, and is consistent with the mitigation goals of the hatchery facilities and with state and Federal laws for mitigation and sustainable fisheries, as well as Federal Treaty Trust responsibility and court ordered settlement agreements developed in U.S. vs. Oregon. Current broodstock goals are about 3,200 Snake River fall Chinook adults which are collected as voluntary returns to the Lyons Ferry and Nez Perce tribal hatchery ladders and at Lower Granite Dam. Fish culture operations at the Lyons Ferry fish hatchery are described in WDFW (2002). Fish culture operations at the Nez Perce tribal hatchery are similar to practices at Lyons Ferry. The purpose and goals of the hatchery are described in a master plan (NPT 2000), and addressed in the section 7 biological opinion that covers artificial propagation of anadromous fish in the Columbia River Basin (NMFS 1999).

The Lower Granite trap was built and is used primarily for research, with tag detectors and diversion gates to selectively sample Passive Integrated Transponder (PIT) and coded-wire tag (CWT) marked adult salmon and steelhead. The trap has been used in recent years for management purposes including sorting and removing out-of-basin stray fall Chinook and collection of fall Chinook broodstock for LFH and NPTH. The trap and crew are currently sampling 11-15 percent of the fall Chinook and steelhead runs passing LGR to gather data for reconstruction of the fall Chinook and steelhead runs. The sampling rate is determined by the proportion of each day that the trap is open; in other words, to sample 15 percent of the run, the trap is open 15 percent of the day (24 hours*60 minutes*0.15 = 216 minutes). The sampling rate is constrained by the capacity of the trap and anesthetic tank and the logistics of manpower and facilities. If the run is larger, the sampling rate is lower (11 percent), but if the run is moderate, the sampling rate is higher (15 percent). This sampling entails handling 25,000-35,000 salmon and steelhead out of a total run of about 200,000 steelhead and 20,000 fall Chinook.

Fish enter the south shore ladder and ascend to the trap facility. Electronic controls direct fish passing through the ladder into a trap holding facility 11-15 percent of each hour, 24 hours a day.

When not directed into the trap, most fish pass the ladder unimpeded. Other studies currently underway at the facility use electronic PIT tag detectors to select specific fish by code to be directed into the trap. Trapped fall Chinook salmon are anesthetized, examined, tagged and sampled (scales or tissue). The fall Chinook salmon selected for broodstock are injected with Oxytetracycline, and placed in a recovery tank. Once partially recovered, the salmon are placed in larger holding tanks to await transportation to LFH or NPTH. The Chinook that are not selected for broodstock are identified, examined, sampled and placed in a recovery tank before being returned to the ladder to continue their upstream migration. The steelhead that are trapped, are anesthetized, handled, scale sampled if required, and immediately released to the ladder to resume their upstream travel. The trap operation and layout is as described by Harmon (2003). All trap operations will follow the "Protocols for Adult Fish Trapping Operations at the Lower

Granite Dam” (USACE 2005).

Incidental to the research and monitoring operations of the trap, adult fall Chinook are collected for broodstock to support artificial propagation programs at LFH and NPTH. Also, salmon that can be identified by tags and marks as strays from hatchery programs outside the Snake River Basin are removed. The actions considered in this NEPA analysis require collection or sampling of fall Chinook and steelhead are described in the following sections.

Run Reconstruction, fall Chinook: Snake River fall Chinook have been identified in U.S. vs. Oregon agreements as an indicator of upriver bright fall Chinook (URB) population health, and are an important factor used by U.S. vs. Oregon parties in establishing Columbia River fisheries and allocating harvest to various user groups. Key to this process is an accurate annual description of the makeup of the fall Chinook population that has passed above LGR Dam to spawning areas (“Run Reconstruction”). Further, as efforts expand to recover fall Chinook in the Snake River, NOAA Fisheries must track population abundance and productivity toward a future recovery of the population when protection under the ESA would no longer be necessary (de-listing).

To accomplish these multiple tasks, a sample of the fall Chinook population at LGR Dam is collected annually, and transferred to LFH or NPTH. During the spawning process, salmon are identified by marks and tags, scale patterns and genetic markers. Natural-origin fish are infused into the hatchery population, and data collected during spawning is used to “reconstruct” the structure of the population at LGR Dam for managers. Reconstruction data includes estimating population age structure from tags and scale pattern analysis, estimating abundance and trend data for the natural population, and estimating returns and smolt-to-adult return rates (SARs) for both hatchery and wild fish. Run reconstruction provides substantial information to the agencies that use it to make informed management decisions for the population.

Relative reproductive success of hatchery and wild fall Chinook: Fall Chinook salmon passing LGR Dam and accessing Upper Snake River spawning grounds have increased in abundance significantly since 1995, especially the quantity of natural-origin fish. During this period, relative proportions of Lyons Ferry hatchery-origin fish in escapements have also increased, from approximately 0 percent in 1995 to as high as 64 percent in 1998. It is unknown what contribution hatchery-origin fish have provided to the increase in natural-origin spawner abundance. Fall Chinook from LFH and NPTH are used in supplementation and rebuilding efforts throughout the remaining fall Chinook habitat in the Snake River Basin.

Productivity of Snake River Basin fall Chinook is currently estimated from trends in redd counts for the mainstem and several subbasins. Redds often are under-counted because of difficulties detecting redds due to water clarity, depth of water at redd location, and weather conditions, however counts appear to be increasing in some areas. Unfortunately, natural- and hatchery-origin fish productivity cannot be estimated separately, thus contributions of naturally spawning hatchery fish to increases in productivity are unknown. Determining the reproductive success of natural spawners has been identified as a priority in the NMFS Biological Opinion for the Federal Columbia River Power System (FCRPS).

If the proportion of hatchery-origin natural spawners continues to increase and their reproductive success is high, managers would expect the genetic profile of natural-origin fall Chinook in future years to become more similar to that of the hatchery-origin broodstock. A time-series of broodyear-based genetic data for Snake River fall Chinook should permit effective monitoring of change in the wild population as recovery efforts continue. The long-term study is expected to determine whether hatchery-reared fall Chinook are contributing to recovery of the Snake River population, which addresses concerns listed in FCRPS Biological Opinion Action 182. If the relative reproductive success study can accurately determine hatchery- and natural-origin fall Chinook relative reproductive success, the results have the potential to change management in the Snake River Basin, resulting in a biological benefit to the Snake River Fall Chinook ESU.

Run reconstruction – Summer Steelhead: Snake River Steelhead *O. mykiss* were listed as threatened under the Endangered Species Act (ESA) on August 18, 1997. In the Snake River Basin, two life history variations, commonly referred to as A-run and B-run are recognized. These two life history variations are characterized by differences in location of spawning, size at age, ocean age composition, and time of migration into freshwater. B-run fish are believed to spawn primarily in the South Fork Clearwater River, Lochsa River, Selway River, South Fork of the Salmon River and Middle Fork of the Salmon River, while A-run fish are found primarily in the Lower Clearwater River, Upper Salmon River, Lower Salmon River, Grande Ronde River, Imnaha River and tributaries of the Snake River below Hells Canyon Dam. While A-run steelhead are also found throughout the inland Columbia River Basin, B-run steelhead are believed to be found only in the Snake River drainage. B-run steelhead enter freshwater later than A-run steelhead, are typically larger at age (likely because of the additional time they spend feeding in the ocean before migrating into freshwater), and the annual run typically has a higher proportion of fish that have spent two years at sea. These differences in life history led the NMFS to consider B-run steelhead as a biologically significant and distinct component of the Snake River ESU.

The Interior Columbia Basin Technical Recovery Team has proposed preliminary viability numbers for 26 steelhead populations in the Snake River ESU (ICBTRT 2004). These numbers total 29,000 steelhead, consisting of about 12,000 B-run and 17,000 A-run fish. These preliminary viability numbers do not translate directly into run counts at Lower Granite Dam. For example, it is necessary for slightly more than half of the individual populations to achieve viability for the ESU to be considered viable, which could lead to the conclusion that the desired escapement is only slightly more than half of the total. However, it is unlikely that steelhead escapement would be evenly distributed among the populations and it might be necessary for the total run to be somewhat larger than 29,000 to achieve viable levels in more than half of the populations with proportional distribution among A-run and B-run populations as well as proportional representation of different size populations. In order to describe the status of the steelhead ESU, it is necessary for managers to accurately determine the proportions of A-run and B-run fish as well as the proportions of hatchery- and natural-origin fish.

The Technical Advisory Committee to the U.S. vs. Oregon process (TAC) has used scale analysis and size criteria to estimate the abundance of A-run and B-run fish crossing Bonneville

Dam, caught in various fisheries, and crossing Lower Granite Dam beginning with the 1985 run. Since 1985, the interim abundance target at Lower Granite Dam has not been achieved for B-run fish (based on the scale/length method). Escapements of A-run fish (also based on the scale/length method) have generally been two to three times larger than B-run fish, but still below the interim goal in all but the last few years since 1985 (WDFW et al 2005).

The small population size of Snake River steelhead, and poor population growth rates led NOAA Fisheries to conclude that maximizing the escapement was necessary. Because B-run fish are the weaker of the two stocks relative to escapement goals, the strategy since 1998 has been to limit the harvest rates on fisheries in the Columbia River to no more than 17 percent (treaty Indian < 15 percent, non-Indian fisheries < 2 percent). Many of these steelhead are caught in treaty Indian fisheries that target fall Chinook salmon between Bonneville Dam and McNary Dam (Zone 6). In non-Indian fisheries, steelhead are caught incidentally in the lower river gillnet fishery that targets fall Chinook and recreational fisheries, although natural-origin steelhead may not be retained in possession in non-treaty fisheries. NOAA Fisheries has limited fishing mortality in the Columbia River on listed Snake River fall Chinook to no more than 31.29 percent. Because neither the Tribes nor states desire to limit access to fall Chinook due to ESA limits on the allowable harvest rate on B-run steelhead, substantial work has been done to evaluate and implement fishing methods to minimize the mortality of large, B-run steelhead.

Sampling the steelhead runs at Bonneville Dam and Lower Granite Dam to estimate the number of A-run and B-run fish of hatchery- and natural-origin provides NOAA Fisheries and the parties to U.S. vs. Oregon the data used to implement the harvest rate limit in the Zone 6 fishery as well as monitoring the status of the different population components.

NMFS proposes to issue Section 10 (a)(1)(A) permit 1530 to the applicants with the following limits on direct and incidental take and special conditions:

This permit is for work to be conducted over approximately a five-year period. Take numbers listed below are the maximum authorized per year.

Direct Take

1. Up to 250 adult, natural-origin, Snake River fall Chinook; live-capture, handle, measure, sample tissue/scales, and release;
2. Up to 320 adult, natural-origin, Snake River fall Chinook; live-capture, handle, measure, sample tissue/scales, transport, and kill spawn;
3. Up to 25 adult, natural-origin, Snake River fall Chinook; live-capture, handle, incidental mortality;
4. Up to 2,250 adult, hatchery-origin, Snake River fall Chinook; live-capture, handle, measure, sample tissue/scales, transport, and kill spawn;
5. Up to 500 adult, hatchery-origin, Snake River fall Chinook; live-capture, handle, measure, sample tissue/scales, and release;

6. Up to 50 adult, hatchery-origin, Snake River fall Chinook; live-capture, handle, incidental mortality;
7. Up to 500 adult, natural-origin, Snake River fall Chinook; observe, collect tissue samples from dead fish on spawning ground surveys;
8. Up to 2,000 adult, natural-origin, Snake River steelhead; live-capture, handle, measure, sample tissue/scales, and release;
9. Up to 5,000 adult, natural-origin, Snake River steelhead; live-capture, handle, measure and release;
10. Up to 25 adult, natural-origin, Snake River steelhead; live-capture, handle, incidental mortality;
11. Up to 2,000 adult, hatchery-origin, Snake River steelhead; live-capture, handle, measure, sample tissue/scales, and release;
12. Up to 4,750 adult, hatchery-origin, Snake River steelhead; live-capture, handle, measure and release;
13. Up to 50 adult, hatchery-origin, Snake River steelhead; live-capture, handle, incidental mortality.
14. Up to 15 percent of Snake River spring/summer Chinook salmon may be handled when sampling for steelhead.

Incidental Take

Incidental take of Snake River sockeye is not likely to result from the permitted collection and sampling of fall Chinook and steelhead. However, because of the inherent biological attributes of aquatic species such as salmon and steelhead, the dimensions and variability of Columbia and Snake River system and tributaries, and the operational complexities of research actions, determining precise incidental take levels of listed species attributable to scientific research and enhancement activities is not possible at present. In the absence of quantitative estimates of incidental take, NOAA Fisheries will monitor update reports required below (See Special conditions B.9. and B.14.) to assure that incidental take levels do not operate to the disadvantage of listed species. If NOAA Fisheries determines that incidental take levels have been reached which would operate to the disadvantage of listed species, the permit Holders shall suspend the enhancement/research activities authorized in this permit.

Special Conditions

1. This permit is for activities to be conducted over a period of five years, between August 1, 2005 and December 31, 2010. Annual take listed in sections A.1. through A.13. is subject to the annual authorization process (see Section B - Reports and Annual Authorization Requirements) during the period that this permit is valid.

2. The Permit Holders must ensure that listed species are taken only at the levels, by the means, in the areas, and for the purposes stated in the permit application, and according to the terms and conditions in this permit.
3. The Permit Holders may collect Chinook and steelhead from the fish trap in the Lower Granite Dam fish ladder, near Pomeroy, Washington annually from March 15 through December 31.
4. The Permit Holders or their agents may capture, handle, and release 11 to 15 percent of the naturally produced and artificially propagated Snake River steelhead and fall Chinook salmon that pass the trap, using standard fish trapping techniques developed by the NMFS/NWFSC trap operators.
5. Lethal take, as determined by observation of mortalities in the trap or prior to release, of Snake River steelhead may not exceed two percent of the fish captured.
6. For the purposes of reproductive success studies, the Permit Holders may collect fin tissue, scales or opercle punches from listed fall Chinook.
7. Each ESA-listed fish handled out-of-water for the purpose of recording biological information must be anesthetized. Anesthetized fish must be allowed to recover (e.g., in a recovery tank) before being released. Fish that are simply counted must remain in water but do not need to be anesthetized.
8. ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during sampling and processing procedures. Adequate circulation and replenishment of water in holding units is required. When a mix of species is captured, ESA-listed fish must be processed first. The transfer of ESA-listed fish must be conducted using equipment that holds water during transfer (e.g., sanctuary net or bucket).
9. The trap may be operated when water temperatures are within the range of 70°F to 72°F, provided that researchers closely adhere to the “Protocols for Adult Fish Trapping Operations at Lower Granite Dam” developed by the Corps of Engineers. Trapping operations will not be allowed, and trapping must cease immediately, if fish ladder water temperatures exceed 72°F.
10. Tissue samples and/or scales collected during activities authorized above may be transferred to the Washington Department of Fish and Wildlife or NMFS laboratories for analysis and/or maintained in an archive.
11. The permittees must participate in a coordinated planning process to review the operation of and anticipated changes to the trapping and sampling program. The coordinated planning developed annually as part of the Lyons Ferry Annual Operating Plan, will address:

- a) sampling protocols for each annual run,
 - b) annual requirements, collection and distribution of fall Chinook taken for broodstock,
 - c) coordination of data and sampling,
12. The ESA-listed fish used for research/enhancement activities may only be taken by the means, in the areas, and for the purposes set forth in the application and modification requests, as limited by the terms and conditions specified in this permit.
13. The Terms and Conditions of the section 10 permit concerning samples collected under this authorization remain in effect as long as the material taken is maintained under the authority and responsibility of the Permit Holders. Tissues of collected animals are the responsibility of the Permit Holders and remain so as long as they are useful for research purposes. Transfer of the tissues from the Permit Holders to other researchers requires written approval from the Branch Chief, Hatcheries and Inland Fisheries Branch, NW Region of NOAA Fisheries.

Permit Reporting and Reauthorization Requirements

For the duration of this permit, work in each succeeding year is contingent on submission and approval of a report on each preceding year's research/enhancement activities. Annual reports are due by March 31 of each year.

Contact: Technical Specialist
 Hatcheries and Inland Fisheries Branch
 10095 W. Emerald Street, Suite 180
 Boise, ID 83709

(208) 378-5614
(208) 378-5699 (FAX)

The annual report must include:

1. a description of activities conducted under this permit, including the total number of fish taken, the number of ESA-listed fish taken at each location, the manner of take, the dates and locations of take, and the disposition of each fish, including a description of how all take estimates were derived;
2. a schedule of proposed collections and sampling for the following year. The schedule shall include preseason estimates of expected natural and hatchery-origin fish returns and the proposed collection protocols for the upcoming year.
3. results, or progress, in the run reconstruction and relative reproductive success portions of the research actions and other monitoring results;
4. measures taken to minimize impacts to ESA-listed fish and the effectiveness of those measures, the condition of ESA-listed fish used for research/enhancement activities, a description of the effects of research/enhancement activities on the

subject species, the disposition of ESA-listed fish in the event of mortality, and a brief narrative of the circumstances surrounding injuries or mortalities of ESA-listed fish;

5. a narrative description of any problems that may have arisen during research/enhancement activities and a statement as to whether the research/enhancement activities had any unforeseen effects;
6. steps that have been taken to coordinate research and artificial propagation activities with co-managers.

Notification Requirements and Operational Reports

Contact: Technical Specialist
 Hatcheries and Inland Fisheries Branch
 10095 W. Emerald Street, Suite 180
 Boise, ID 83709

(208) 378-5614
 (208) 378-5699 (FAX)

1. Exceeding Authorized Take If the authorized level of take, including mortalities, is exceeded or if circumstances indicate that such an event is imminent, the Permit Holders must notify the above contact as soon as possible, but no later than two days after the authorized level of take is exceeded. The Permit Holders must then submit a written report to the above contact describing the circumstances of the unauthorized take. Pending review of these circumstances, NOAA Fisheries may suspend research activities or amend this permit in order to allow research activities to continue.
2. Taking of Unauthorized ESA-listed Species If any ESA-listed species not included in this permit is killed, injured, or collected during the course of research and enhancement activities, the Permit Holders must notify the above contact as soon as possible, but not later than two days after the event. The Permit Holders must then submit a written report to the above contact, describing the circumstances of the unauthorized take. Pending review of these circumstances, NOAA Fisheries may suspend activities or amend this permit in order to allow activities to continue.
3. Transfer of Biological Samples The transfer of any biological samples from the Permit Holders to researchers other than those specifically identified in the application requires written approval from NOAA Fisheries.
4. Unintentional Killing of Authorized ESA-Listed Species In the event that an ESA-listed species is killed, other than those authorized, the Permit Holders must notify the above contact verbally as soon as possible, but no later than two days following the event. The Permit Holders must then submit a written report to the

above contact describing the circumstances surrounding the event. The Permit Holders must re-evaluate the techniques that were used and those techniques must be revised accordingly to prevent further injury or death. Pending review of these circumstances, NOAA Fisheries may suspend research activities or amend this permit in order to allow research activities to continue.

General Conditions

1. The Permit Holders must ensure that the ESA-listed species are taken only by the means, in the areas, and for the purposes set forth in the permit application, as limited by the terms and conditions in this permit.
2. The Permit Holders must ensure that all ESA-listed species are handled carefully. Should NOAA Fisheries determine that a procedure provided for under this permit is no longer acceptable, the Permit Holders must immediately cease such activity until NOAA Fisheries determines an acceptable substitute procedure.
3. The Permit Holders, in effecting the take authorized by this Permit, are considered to have accepted the terms and conditions of this permit and must be prepared to comply with the provisions of this permit, the applicable regulations, and the ESA.
4. The Permit Holders are responsible for the actions of any individual operating under the authority of this permit. Such actions include capturing, handling, releasing, transporting, maintaining, and caring for any ESA-listed species authorized to be taken by this permit.
5. The Permit Holders, personnel, or designated agent acting on the Permit Holders' behalf must possess a copy of this permit when conducting the activities for which a take of ESA-listed species or other exception to ESA prohibitions is authorized herein.
6. The Permit Holders may not transfer or assign this permit to any other person(s), as person is defined in Section 3(12) of the ESA. This permit ceases to be in force or effective if transferred or assigned to any other person without prior authorization from NOAA Fisheries.
7. The Permit Holders must obtain any other Federal, state, and local permits/authorizations necessary for the conduct of the activities provided for in this permit. In addition, before taking ESA-listed species in the territorial waters of a foreign country, the Permit Holders must secure consent from, and comply with the appropriate laws of, that country.
8. Any personnel of the Permit Holders requiring Federal or state licenses to practice their profession must be duly licensed under the appropriate law.
9. The Permit Holders must coordinate with other co-managers and/or researchers to ensure that no unnecessary duplication and/or adverse cumulative effects occur as a result of the Permit Holders' activities.
10. The Permit Holders must allow any NOAA Fisheries employee(s) or any other person(s) designated by NOAA Fisheries, to accompany field personnel during

the activities provided for in this permit. The Permit Holders must allow such person(s) to inspect the Permit Holders' records and facilities if such records and facilities pertain to ESA-listed species covered by this permit or NOAA Fisheries' responsibilities under the ESA.

11. Under the terms of the regulations, a violation of any of the terms and conditions of this permit will subject the Permit Holders, and/or any individual who is operating under the authority of this permit, to penalties as provided for in the ESA.
12. The Permit Holders are responsible for biological samples collected from ESA-listed species as long as they are useful for research purposes. The terms and conditions concerning any samples collected under this authorization remain in effect as long as the Permit Holders maintains authority and responsibility of the material taken. The Permit Holders may not transfer biological samples to anyone not listed in the application without obtaining prior written approval from NOAA Fisheries. Any such transfer will be subject to such conditions as NOAA Fisheries deems appropriate.
13. The Northwest Region, NOAA Fisheries, may amend the provisions of this permit after reasonable notice to the Permit Holders.
14. 50 CFR Section 222.23(d)(8) allows NOAA Fisheries to charge a reasonable fee to cover the costs of issuing permits under the ESA. The fee for this permit has been waived.
15. NOAA Fisheries may revoke this permit if the activities provided for by it are not carried out, if the activities are not carried out in accordance with the conditions of the permit and the purposes and requirements of the ESA, or if NOAA Fisheries otherwise determines that the findings made under section 10(d) of the ESA no longer hold.
16. Any falsification of annual reports or records pertaining to this permit is a violation of this permit.
17. The permit Holders, in signing this permit, have accepted and will comply with the provisions of this permit, applicable regulations (50 CFR 222), and the ESA.

2.3 Alternative 3 – Other Alternatives Considered

A primary purpose of this NEPA analysis was to determine if reasonable options existed which would allow the applicants to partially, or fully meet the goals outlined in their application that would provide increased protection of natural-origin ESA listed fall Chinook and which would be otherwise more conservative with respect to environmental impacts. The broodstock collection and population monitoring actions considered in the permit application were developed to mitigate for fish and habitat losses related to development of Federal and private

hydroelectric dams on the Snake River system, and to provide important information regarding population status to managers. The mitigation responsibilities are established in Congressional acts, Idaho Power Company's Federal Energy Regulatory Commission license for operation of the Hells Canyon Complex, Federal court orders and agreements. Since the Snake River fall Chinook were listed under the ESA in 1992, the hatchery operations have taken on an important role in the maintenance and recovery of the species. One of the large unanswered questions in the recovery of listed salmon is the effect of supplementation of natural populations with artificially cultured fish. The reproductive success portion of the proposed action is in response to the need to answer that question. The operation of these facilities has evolved, over the past 13 years, since the species was listed, in consultation with the state, Federal agencies, and Indian Tribes, to a balance of research, conservation and mitigation commitments. The proposed permit represents ongoing conduct of activities with more than 20 years of operation, 12 years under the guidance of the ESA. Alternatives to continuing the programs that might meet legal mandates and also contribute to restoration of listed species are limited.

However, NMFS also evaluated two other possible alternatives within the scope of the proposed action, and rejected each. A brief summary of these alternatives and why they were rejected is provided below.

1) Significantly Modify or Eliminate the Artificial Propagation Program.

The primary purpose of the hatchery facilities and the artificial propagation programs is to mitigate for lost salmon production caused by construction of hydroelectric dams on the Snake River, four of which were constructed by and are operated by the Federal government. We believe that a decision to not authorize the operation of these facilities (save with those conditions deemed necessary and advisable for the conservation of listed species) would be contrary to Federal policy, plans, statutes, and Treaty Trust responsibility as outlined in this document. Without trapping at Lower Granite Dam, the artificial propagation programs would continue, using fish that voluntarily return to the hatchery ladders as broodstock. However, production goals would be difficult to meet and the controlled integration of natural-origin salmon into the broodstock would be difficult or impossible. There have been modifications in production levels and broodstock management protocols at these facilities to become more protective since the salmon species became listed, but further modification is neither necessary for conservation purposes or in compliance with mitigation agreements. For those reasons, this alternative was not analyzed further.

2) Significantly Modify or Eliminate the Monitoring and Evaluation Program.

The M&E portion of this proposed action is necessary to describe the status and trends of the listed populations, and to evaluate the impacts of operations of the FCRPS and artificial propagation on the natural components of the populations. Significant modification or termination of this research before completion of evaluation would be wasteful and would leave important uncertainties regarding the status and trends of the populations and the effects of management programs unanswered. Therefore, this alternative was not considered to be viable and was not analyzed further.

No other alternatives were identified that would achieve the purpose and need for this activity.

Potential options might include increasing the number of fish produced by the hatchery program (to increase the number of fish available for harvest), or to decrease the allowable level of harvest (to be more protective of the natural component of the return). However, the management program currently in place for the Snake River carefully balances a number of objectives and concerns, to the extent that options measurably outside the bounds of the program are likely to have inappropriate and adverse effects on the natural resources. The artificial propagation programs have been designed to enhance naturally spawning populations, with goals of restoring Snake River fall Chinook resource to a level that achieves ESA recovery and supports Treaty trust and recreational fisheries. Increases in program production would exceed the objectives of the extant program plan and therefore would not meet the purpose and need as stated.

3.0 Affected Environment

3.1 Riparian Environment

Over a century of livestock grazing and instream flow alterations have substantially altered the species diversity, structure, composition, and connectivity of the riparian zones in the Snake River Basin. The activities considered in this analysis take place in an existing fish ladder, at an existing Federally-constructed, hydroelectric dam and are not expected to have any additional impact on riparian areas or streams.

3.2 Water Quality

Water quality in some areas of the Snake River Basin is affected to varying degrees by land uses that include livestock grazing, road construction, logging, and mining, agriculture, urban development and industrial uses. The activities considered in this analysis take place in an existing fish ladder, at an existing Federally-constructed, hydroelectric dam. The trapping and biological sampling actions use a very small amount of water that is not discharged back to the stream, and so these actions are not expected to have any impact on water quality.

3.3 Anadromous Fish Listed Under the ESA

Anadromous salmon reach the headwaters of the Salmon River at elevations more than 6,500 feet above sea level and a distance of over 900 miles from the ocean. Dams have blocked access to about one-third of the habitat formerly occupied by anadromous fish in the Snake River Basin. However, approximately two thirds of historical spawning and rearing habitat (over 5,000 stream miles) within the Idaho portion of the Snake River Basin remains available to anadromous fish (IDFG 1985). Many of the historically most important spawning and rearing areas are located within the largest block of dedicated wilderness in the 48 contiguous states, in Wild and Scenic River corridors and National Recreation Areas, and remain in excellent condition.

Since 1991, NMFS has identified 12 populations of Columbia River Basin salmon and steelhead as requiring protection under the ESA. Four of the listed ESUs originate in the Snake River Basin. The populations that may be impacted by the artificial propagation program covered in

this EA and their current listing status are described below. The ESA-listed population includes some portion of artificially propagated fish as well as the wild/natural populations.

- a) Snake River spring/summer Chinook salmon, *Oncorhynchus tshawytscha*, were listed as threatened on April 22, 1992. This ESU includes tributaries to the Snake River upstream of the Snake and Columbia River's confluence. It includes all natural populations and certain hatchery produced components of spring and summer Chinook salmon populations in the mainstem Snake River and the following subbasins: Tucannon River, Grande Ronde River, Imnaha River, and Salmon River. Spring/summer Chinook salmon returning to hatchery programs and supplementation programs in the Clearwater River are excluded, because the native stocks were extirpated by dams and the current populations were reintroduced after the dams were breached (Matthews and Waples 1991).
- b) Snake River fall Chinook salmon, *O. tshawytscha*, were listed as threatened on April 22, 1992. This ESU includes all natural populations of fall-run Chinook salmon in the mainstem Snake River and the following subbasins: Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River. Although not presently listed, the Snake River fall Chinook stock maintained at Lyons Ferry hatchery is deemed to be included in the ESU and is utilized for rebuilding natural spawning populations (NMFS 1998).
- c) Snake River sockeye salmon, *O. nerka*, were listed as endangered on November 20, 1991. This population remains only in Redfish Lake, at the headwaters of the Salmon River and in a captive broodstock program designed to restore natural spawning populations in Redfish Lake and nearby Petit and Alturas Lakes (Flagg and McCauley 1996).
- d) Snake River Basin steelhead, *O. mykiss*, were listed as threatened on August 18, 1997. This inland steelhead ESU occupies the Snake River Basin of southeast Washington, northeast Oregon, and Idaho (Busby et al. 1996). This ESU includes all natural populations of steelhead in the mainstem Snake River and the following subbasins: Tucannon River, Grande Ronde River, Imnaha River, Salmon River, Clearwater River, and tributaries to the mainstem Snake River below Hells Canyon Dam. Steelhead returning to supplementation programs in the Tucannon River, Imnaha River, and Salmon River are also included as listed based on the progeny rule.

Upstream migrating adult Snake River spring and summer Chinook salmon pass Bonneville Dam from March through May and June through July respectively (56 FR 29542). Spring Chinook salmon generally tend to spawn in higher elevated streams than summer Chinook salmon although there is considerable overlap in some basins. Most spring/summer Chinook salmon enter individual subbasins from mid-May through late-September and spawn from late-August through late-September.

Spring/summer Chinook salmon juveniles begin emerging from the gravel from late-February through early-June with peak emergence between April and early-May. Their size from March to June is 30 to 40 mm in fork length (FL). By mid-summer they are 55 to 75 mm (FL) long and 80 to 105 mm (FL) long by fall. Summer (August) and fall (September-November) emigration

from upper stream rearing areas to lower elevation rivers is common. Chinook salmon smolts are 90 to over 120 mm (FL) long by spring when seaward migration occurs in April and May. Emigration timing past Lower Granite Dam is somewhat protracted and occurs from early-April through June (56 FR 29542).

Snake River Fall Chinook salmon cross Bonneville Dam after August 1 each year and arrive in Snake River in September and October. In the Snake River, habitat utilized by fall Chinook salmon for spawning and early juvenile rearing is very different from that utilized by spring-run and summer-run fish. The latter two forms spawn and rear in higher elevation sections of the Salmon River and other tributary streams, whereas fall Chinook salmon use mainstem areas of the Snake River and the lower parts of major tributaries.

Snake River Sockeye salmon migrate through the Lower Columbia River during June and July, with normal peak passage at Bonneville Dam around July 1. Sockeye salmon runs include fish from a remnant Snake River stock listed as endangered since December 1991. Only a very few of these fish (fewer than 20 wild fish in the past 10 years) arrive at spawning areas near the headwaters of the Salmon River in August and September.

In the Snake River Basin, two life history variations of steelhead, commonly referred to as A-run and B-run are recognized and characterized by differences in location of spawning, size at age, ocean age composition, and time of migration into freshwater. B-run fish are believed to spawn primarily in the Clearwater River, South Fork of the Salmon River and Middle Fork of the Salmon River, while A-run fish are found primarily in the Lower Clearwater River, Upper Salmon River, Lower Salmon River, Grande Ronde River, Imnaha River and tributaries of the Snake River below Hells Canyon. A-run steelhead are found throughout the inland Columbia River Basin while B-run steelhead are found only in the Snake River drainage. B-run steelhead enter freshwater later than A-run steelhead (late August-September compared to July-August), are typically larger at age (likely because of the additional time they spend feeding in the ocean before migrating into freshwater), and the annual run typically has a higher proportion of fish that have spent 2 years at sea.

3.4 Other Listed Fish Species

One other ESA-listed fish species is expected to be present in the action area. The Columbia River population segment of bull trout (*Salvelinus confluentus*) was listed as threatened by the United States Fish and Wildlife Service in 1997. Bull trout populations are known to exhibit four distinct life history forms: resident, fluvial, adfluvial, and anadromous. Resident bull trout spend their entire life cycle in the same (or nearby) streams in which they were hatched. Fluvial and adfluvial populations spawn in tributary streams where the young rear from 1 to 4 years before migrating to either a lake (adfluvial) system or a river (fluvial) system, where they grow to maturity. Anadromous fish spawn in tributary streams, with major growth and maturation occurring in salt water.

Migratory bull trout have been restricted or eliminated due to stream habitat alterations, including seasonal or permanent obstructions, detrimental changes in water quality, increased

temperatures, and the alteration of natural stream flow patterns. The disruption of migratory corridors, if severe enough, would result in the loss of migratory life history types and isolate resident forms from interacting with the metapopulation. The Columbia River population segment encompasses a vast geographic area including portions of Idaho, Montana, Oregon, Washington, and British Columbia. Within the Snake River Basin, in waters occupied by anadromous salmon and steelhead, bull trout primarily exhibit the fluvial and resident life histories. Also within the Snake River Basin, there is likely some degree of connectivity among the populations in the Snake River and its major tributaries. Bull trout are present, and locally common, in all of the rivers and streams occupied by anadromous fish in the Snake River Basin.

3.5 Non-Listed Fish Species

Approximately 60 other species of fish live in the Snake River and tributaries. About half are native species primarily of the families *Salmonidae*, *Catostomidae*, *Cyprinidae* and *Cottidae*. White sturgeon, *Acipenser transmontanus*, occur in the mainstem Snake and Salmon rivers. The Snake River Basin also supports at least 25 introduced species primarily representing *Percidae*, *Centrarchidae* and *Ictaluridae* (Simpson and Wallace 1978).

3.6 Terrestrial Organisms

The state of Idaho reports 364 known species of vertebrates as reproducing populations, nearly all of which are expected to occur within the Snake River Basin of Oregon, Washington, and Idaho. Distribution maps and species lists are contained in "Atlas of Idaho's Wildlife" (Groves et al. 1997). Two mammal species and one bird species which are listed under the ESA may occur in the area. Gray wolf (*Canis lupus*) occur as an introduced population with an experimental/non-essential designation. The Canada lynx (*Lynx canadensis*), and bald eagle (*Haliaeetus leucocephalus*) are listed as threatened.

3.7 Social and Economic Resources

Salmon are socially, culturally, economically, and symbolically important to the Pacific Northwest. Columbia River Chinook salmon populations were at one time acknowledged to be the largest in the world. Prior to the 1960s, the Snake River Basin was the most important drainage in the Columbia system for producing salmon (NMFS 1995). Native Americans camped, fished, and hunted in the area for thousands of years and salmon were an important aspect of the cultural life and subsistence of the Indian Tribes. European settlers arrived in the area in the 1800s. Salmon provided subsistence fishing for the early miners and ranchers and later supported popular recreational fishing and contributed to an active outfitting and guiding industry. The cultural importance and former abundance of salmon in the area is memorialized in the names of geographic features and landmarks like the Salmon River, Salmon City, and Redfish Lake.

The current depleted status of salmon populations has ended many of the cultural practices and subsistence uses of salmon made by the local Indian Tribes and curtailed the economic and cultural benefits of the non-Indian recreational fisheries that the salmon resource formerly supported.

3.8 Environmental Justice

Executive Order 12898 (59 FR 7629) states that Federal agencies shall identify and address, as appropriate, "...disproportionately high and adverse human health or environmental effects of [their] programs, policies and activities on minority populations and low-income populations..." While there are many economic, social, and cultural elements that influence the viability and location of such populations and their communities, certainly the development, implementation, and enforcement of environmental laws, regulations, and policies can have impacts. Therefore, Federal agencies, including NMFS, must ensure fair treatment, equal protection, and meaningful involvement for minority populations and low-income populations as they develop and apply the laws under their jurisdiction.

In the analysis area, there are minority and low-income populations that this Executive Order could apply to, including Native American Indians. The proposed monitoring action provides important information about the status of salmon runs. The broodstock collection action supports hatchery programs that are designed to restore a depleted salmon population that potentially would support subsistence harvest opportunity specifically for tribal members. Much of the Snake River Basin is rural, with relatively high rates of unemployment and poverty. Within this area there is a cultural and economic dependence on extractive use of natural resources including hunting and fishing for food and the economic benefits of spending by hunters and fishermen who come from outside the region to partake in the local resources.

3.9 Tribal Trust Responsibilities and Treaty Rights

The United States has a unique relationship with tribal governments as set forth in the Constitution, treaties, statutes, and Executive orders. This body of statutes, treaties and policies, together with Federal court rulings that interpret them, is commonly spoken of as "Treaty Trust

Doctrine.” In keeping with this unique relationship and with the mandates of the Presidential Memorandum on government-to-government relations with Native American tribal governments (May 4, 1994, 59 FR 22951) and with Executive Order 13084 (Consultation and Coordination With Indian tribal governments; May 19, 1998, 63 FR 27655), NMFS developed and published a section 4(d) rule regarding tribal resource management on July 10, 2000 (65 FR 42481). Recognizing the unique status of the Treaty Tribes, the Federal government stated, in the explanatory material accompanying the rule, that the appropriate expression of its trust obligation is a commitment to harmonize its many statutory responsibilities with the tribal exercise of tribal sovereignty, tribal rights, and tribal self-determination.

The Federal government has signed treaties with the Nez Perce Tribe and the Confederated Tribes of the Umatilla Indian Reservation reserving rights for traditional tribal uses such as hunting, fishing, and gathering of plant materials on unoccupied public lands and in areas ceded by the tribes to the United States. The anadromous fish populations that are subject to the proposed actions are traditional tribal resources.

4.0 Environmental Consequences

In this section we evaluate the potential effects of the alternatives on the biological, physical, and human environments. NMFS' determination to issue a permit could affect a variety of natural and human resources.

4.1 No Action Alternative

4.1.1 No Action Alternative – Issue No Permit

Under this alternative, no permit for take of listed Snake River fall Chinook salmon for research and monitoring at Lower Granite Dam fish trap would be issued. It would not be possible for the applicants to implement the broodstock collection or monitoring and research programs without taking listed natural-origin or hatchery-origin fall Chinook salmon and steelhead. Without a permit, the implementation of the proposed (and ongoing) program would result in the unauthorized take of ESA-listed anadromous fish species. Therefore, the implementation of the broodstock collection or monitoring and research programs could not proceed without violating the ESA.

The M&E program is designed to provide information needed to help determine the status of listed anadromous fish populations. Termination of the M&E programs would impede the effort to obtain information needed for management decisions and determining listing status. The broodstock collection action is necessary to support artificial propagation programs that increase the abundance and distribution of listed Snake River fall Chinook. Termination of operation of the hatchery programs would decrease the abundance of ESA listed and unlisted fall Chinook salmon returning to the action area. Termination of the artificial propagation programs while the survival of natural-origin fish is poor through the migration corridor could reduce the diversity and distribution, as well as the abundance and overall productivity of this ESU.

4.1.2 Effects on Riparian Habitat

Under the No Action alternative, no additional adverse impacts on riparian habitat would be expected to occur. The activities considered in this analysis take place in an existing fish ladder, at an existing Federally-constructed, hydroelectric dam. The trapping and biological sampling actions are not expected to have any impact on riparian habitat. The state and Federal highways that parallel and encroach upon riparian areas elsewhere in the basin would continue to exist. Other land uses such as grazing and logging that affect riparian habitat would continue. No geological impacts would occur.

4.1.3 Effects on Water Quality

The No Action alternative would not be expected to result in adverse impacts on water quality. The activities considered in this analysis take place in an existing fish ladder, at an existing Federally-constructed, hydroelectric dam. The trapping and biological sampling actions use a very small amount of water which is not discharged back to the stream and is not expected to have any impact on water quality.

4.1.4 Effects on Anadromous Fish Listed Under the ESA

Under the No Action Alternative, broodstock collection for Lyons Ferry and Nez Perce tribal hatcheries would depend on voluntary swim-ins to each facility. This would reduce the overall availability for eggs to support the programs intended to increase the abundance of these ESA listed runs in the basin, and would limit the ability of agencies to infuse natural-origin fall Chinook into the hatchery broodstock portion of the population. Reductions of the artificial propagation programs while the survival of natural-origin fish is poor through the migration corridor could reduce the diversity and distribution, as well as the abundance and overall productivity of this ESU. The loss of scientific information on population status and trends and relative reproductive success would limit the fishery manager's abilities to initiate changes to benefit the fish if deemed advisable. It would also limit NMFS ability to determine status of listed populations. There would be less impact on natural-origin fall Chinook as a consequence of being incidentally captured at the dam, but each fish would still have to pass through the dam via the fish ladder where the trap is located. Limited monitoring and evaluation of the status of ESA listed hatchery and natural populations by the applicants could still occur based upon fish counts released by the Corps of Engineers.

4.1.5 Effects on Other ESA Listed Fish Species

Under the No Action alternative, ESA-listed bull trout, would be less likely to be affected by the possible capture and release at the trap incidental to Chinook trapping. However, the timing of the Chinook salmon and steelhead trapping coincidentally reduces the likelihood of encountering other species, and trap protocols are designed to minimize stress or injury to both the target and incidental catch.

4.1.6 Effects on Non-Listed Fish Species

Under the No Action alternative, non-listed fish would be less likely to be affected by the possible capture and release at the trap incidental to Chinook trapping. However, trap protocols are designed to minimize stress or injury to both the target and incidental catch.

4.1.7 Effects on Terrestrial Organisms

Under the No Action Alternative, terrestrial organisms would not be affected. All activities take place within the confines of the existing fish ladder and trap.

4.1.8 Effects on Social and Economic Returns

The mitigation programs supported by the proposed broodstock collection are designed to replace salmon runs caused by construction of four hydroelectric dams on the Lower Snake River, and at Hells Canyon. Historically, salmon have been important to the social, cultural and economic fabric of this region. The mitigation program is designed to replace these benefits. The M&E actions are designed to improve information available for management decisions and determine the status of listed populations. The No Action alternative would deprive the population of these benefits.

4.1.9 Environmental Justice

Executive Order 12898 (59 FR 7629) directs Federal agencies to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. Within this area there is a cultural and economic dependence on extractive use of natural resources including hunting and fishing for food and the economic benefits of spending by hunters and fishermen who come from outside the region to partake in the local resources. The No Action alternative could potentially deprive local residents, and others who might visit the area the opportunity to seek cultural and economic benefits provided from the mitigation programs.

4.1.10 Effects on Treaty Trust Responsibilities

The No Action alternative would not be responsive to the policies and precedents described above in section 3.9. The recovery of viable populations of salmon and mitigation for construction of hydroelectric dams in the Snake Basin is consistent with Federal trust responsibilities to provide a harmony between statutory mandates and exercise of tribal cultural, subsistence, and other practices. In the absence of compelling reasons to deny the program under consideration, particularly given the tribal role as cooperators in the M&E and propagation program, and as beneficiaries of the mitigation program, not issuing a permit for the proposed actions would not facilitate wise management of treaty trust resources.

4.2 Alternative 2 (Proposed Action) Issue a Permit with Conditions

4.2.1 Effects on Riparian Habitat

There would be no additional effects on the riparian habitat by implementing either the M&E portion of the proposal or continuing collection of broodstock to support artificial propagation. All of the action considered by this document will take place within the existing facilities. The state and Federal highways that parallel and encroach upon riparian areas would continue to exist. Other land uses such as grazing and logging that affect riparian habitat would continue. No geological impacts would occur.

4.2.2 Effects on Water Quality

There would be minimal affects on water quality by implementing either the M&E portion of the proposal or continuing collection of broodstock to support artificial propagation. All of the action considered by this document will take place within the existing facilities. Water is diverted through the trap and holding facilities from the fish ladder. Small amounts of therapeutic chemicals and anesthetics are used in handling the fish in the anesthetic tank. Water from the anesthetic tank is discharged to a treatment system to eliminate chemicals from being discharged back to the river. The water returned to the river from the trap and holding facilities is of similar quality to that diverted from the ladder.

4.2.3 Effects on Anadromous Fish Listed Under the ESA

Our analysis of the potential effects of the broodstock collection and M&E actions proposed at the Lower Granite Trap relies on the Section 10 permit Application, as well as information attached to the application, published and unpublished literature, personal communication, agency knowledge, and local studies now underway.

The proposed action consists of several research and enhancement activities that involve threatened Snake River fall Chinook salmon and Snake River steelhead. These trap operations and sampling protocols are described completely in section 2.2 above. The number and composition of the fish proposed to be trapped is summarized below in Table 1.

No intentional lethal take of steelhead is anticipated. However, in handling 11 percent to 15 percent of the run, a small number, estimated to be no more than 25 natural-origin fish and 50 hatchery-origin fish may be injured or die due to the trapping and handling necessary for the collection of biological samples.

Within the sample, the applicants estimate that 2,250 hatchery-origin fall Chinook and 320 natural-origin fall Chinook will be collected for broodstock.. The fish must be scale sampled to confirm origin and determine age. Scale sampling may occur on-site prior to transport to the hatcheries. In addition, up to 250 more scale samples from natural-origin fall Chinook are needed to provide an accurate description of run composition. The total broodstock collection is about 3,200 adult fall Chinook salmon, including both the fish that voluntarily return to the Lyons Ferry and Nez Perce tribal hatchery traps and the fish collected during the trapping and sampling at Lower Granite Dam. These fish will be spawned to yield more than five million

fertilized eggs which are expected to produce about 4.7 million smolts that will be released to increase the abundance and distribution of the listed fall Chinook ESU.

Adult Chinook salmon die after they spawn in a natural system. In artificial spawning, the female salmon are tested for ripeness and then killed prior to removing the eggs by opening the fish's abdomen. Male salmon may be kill or live-spawned to collect milt to fertilize eggs, but are killed after contributing to fertilization of one or two female's eggs. Killing the females prior to spawning increases egg survival and ensures that the parents contribute to the next year class of fish. Survival of salmon eggs from spawning to downstream migrant smolt stage in nature is usually in the range of 5-10 percent (Healy 1991), while in the hatchery, egg-to-smolt survival is usually 80-95 percent, in effect giving the artificially spawned fish a 10 or 20-to-one advantage in contributing to the next generation of fish. This ability to rapidly increase the abundance of a target population confers a short-term benefit to the fish.

Neither of the other two listed species of anadromous fish that occur in the Snake River is likely to be affected by the trapping that targets fall Chinook and steelhead during the months of September through December Spring/summer Chinook pass Lower Granite Dam primarily in April through July and sockeye pass the dam in July and early august. If there is a chance encounter of other listed species, they will be released unharmed to continue their migration.

Table 1. Estimated maximum annual take of listed salmon and steelhead associated with the operation of the Lower Granite Dam trap for run reconstruction and broodstock collection under the proposed action

Anticipated Annual Take								
Applicant: Mark Schuck/Becky Johnson/Scott Marshall, WDFW Fish Biologist/NPT Fish Biologist, IDFG Fish Biologist					Location/Project: Snake River and Tributaries			
Number of individuals	Species and/or Population and/or ESU	Life Stage	Sex	Origin	Take Activity Category	Location	Date(s)	Details
250	Snake River Fall Chinook Salmon	Adult	M/F	Natural	Adult trapping- live Capture/Handle, measure, sample tissue/scales, release	Snake River @ Lower Granite Dam	8/18 – 12/05	Scale samples removed for origin identification and age structure.
320	Snake River Fall Chinook Salmon	Adult	M/F	Natural	Adult trapping- live Capture/Handle, measure, sample tissue/scales, transport, and kill spawn.	Snake River @ Lower Granite Dam	8/18 – 12/05	Wild adults for inclusion into Snake R. Hatchery broodstocks.
25	Snake River Fall Chinook Salmon	Adult	M/F	Natural	Adult trapping- live Capture/Handle, indirect mortality	Snake River @ Lower Granite Dam	8/18 – 12/05	Indirect mortality from handling stress.
2,250	Snake River Fall Chinook Salmon	Adult	M/F	Hatchery	Adult trapping- live Capture/Handle, measure, sample tissue/scales, transport, and kill spawn.	Snake River @ Lower Granite Dam	8/18 – 12/05	Hatchery-origin marked and unmarked adults and jacks
500	Snake River Fall Chinook Salmon	Adult	M/F	Hatchery	Adult trapping- live Capture/Handle, measure, sample tissue/scales, release	Snake River @ Lower Granite Dam	8/18 – 12/05	Hatchery-origin marked and unmarked adults and jacks
50	Snake River Fall Chinook Salmon	Adult	M/F	Hatchery	Adult trapping- live Capture/Handle,	Snake River @ Lower Granite Dam	8/18 – 12/05	Indirect mortality from handling

Anticipated Annual Take								
Applicant: Mark Schuck/Becky Johnson/Scott Marshall, WDFW Fish Biologist/NPT Fish Biologist, IDFG Fish Biologist					Location/Project: Snake River and Tributaries			
Number of individuals	Species and/or Population and/or ESU	Life Stage	Sex	Origin	Take Activity Category	Location	Date(s)	Details
					indirect mortality			stress.
500	Snake River Fall Chinook Salmon	Adult	M/F	Natural	Spawning Surveys- Observe/sample Tissue on Dead Fish	Snake River and tributaries	10/15 – 12/15	Carcasses pulled from spawning areas and DNA samples tissue
2,000	Snake River summer steelhead	Adult	M/F	Natural	Adult trapping-live Capture/Handle, measure, sample tissue/scales, release	Snake River @ Lower Granite Dam	3/01 – 12/15	Scale samples removed for origin identification and age structure.
5,000	Snake River summer steelhead	Adult	M/F	Natural	Adult trapping-live Capture/Handle, measure, release	Snake River @ Lower Granite Dam	3/01 – 12/15	Simple handle and pass as part of Chinook sampling
25	Snake River summer steelhead	Adult	M/F	Natural	Adult trapping-live Capture/Handle, indirect mortality	Snake River @ Lower Granite Dam	3/01 – 12/15	Indirect mortality from handling stress
2,000	Snake River summer steelhead	Adult	M/F	Hatchery	Adult trapping-live Capture/Handle, measure, sample tissue/scales, release	Snake River @ Lower Granite Dam	3/01 – 12/15	Measure, note any marks/tags, sample tissue/scales, release
4,750	Snake River summer steelhead	Adult	M/F	Hatchery	Adult trapping-live Capture/Handle, measure, release	Snake River @ Lower Granite Dam	3/01 – 12/15	Measure, note any marks/tags, release
50	Snake River summer steelhead	Adult	M/F	Hatchery	Adult trapping-live Capture/Handle, indirect mortality	Snake River @ Lower Granite Dam	3/01 – 12/15	Indirect mortality from handling stress

When the trap is not operating to collect fall Chinook and steelhead, fish are allowed to pass uninhibited. Trapping will occur 11 to 15 percent of the day, thus for 85 to 89 percent of the day fish have unrestricted access through the ladder without the trap in operation. The impact of the proposed trapping is related just to the collection of broodstock and biological samples as described in this analysis. The existence of the dam, ladder, and trap, and operations of these facilities for other purposes was addressed in other consultations, primarily the FCRPS biological opinion.

4.2.4 Effects on Other ESA Listed Fish Species

One other listed fish species, bull trout (*Salvelinus confluentus*) may occasionally occur in the fish ladder at Lower Granite Dam. A small number of individual bull trout have been observed passing the ladder. However it is not likely that bull trout would be caught in the trap during the 11 to 15 percent of the time that the trap is operating. If a bull trout is caught, it will be examined for marks and tags and released, unharmed, to continue its migration.

4.2.5 Effects on Non-Listed Fish Species

A hatchery program to reintroduce non-listed coho salmon to the Clearwater River system is being conducted by the Nez Perce Tribe. Coho adults run at the same time as fall Chinook and steelhead and are likely to be sampled at the same rate as the target species. Any coho that are trapped will be allowed to recover and be released to complete their migration. Other resident species like carp and suckers may occasionally pass through the fish ladder and could possibly be trapped. Any resident species or non-target fish will be released, unharmed, to continue their movements through the river system.

4.2.6 Effects on Terrestrial Organisms

The trapping activities take place within an existing fish ladder, trap and dam, where no terrestrial species are likely to occur. Therefore, the action considered in this assessment is not expected to have any affect on terrestrial species.

4.2.7 Effects on Social and Economic Resources

Compared to the No Action alternative, the impacts on social and economic resources from the proposed action are expected be beneficial. The broodstock collection portion of the project is designed to support artificial production designed to mitigate for lost fishing opportunities cause by construction of hydroelectric dams on the Snake River. The artificial propagation aspect of this project is also designed to help restore naturally produced listed Chinook salmon populations; restoration will provide the opportunity for non-consumptive observation of spawning salmon and the immeasurable existence value of the salmon population. Furthermore, if the supplementation aspect of the project is successful, in the long term it may contribute to long-term availability of salmon for recreational and subsistence uses. The monitoring and evaluation aspects of the project will provide important management information to support decisions regarding restoration of public resources and effective allocation of expenditure of public funds.

4.2.8 Environmental Justice

Executive Order 12898 (59 FR 7629) directs Federal agencies to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. Under this, or any of the other alternatives considered, we expect no adverse effects on human health or environmental effects on any population located in the action area. The Snake River Basin is largely rural, and the consumptive and non-consumptive values of salmon have cultural and economic importance. Within this area there is a cultural and economic dependence on extractive use of natural resources including hunting and fishing for food and the economic benefits of spending by hunters and fishermen who come from outside the region to partake in the local resources. The proposed action would provide local residents, and others who might visit the area the opportunity to seek cultural and economic benefits provided from the mitigation programs.

4.2.9 Effects on Treaty Trust Responsibilities

The proposed action is more responsive to Treaty Trust responsibilities and policies than the No Action alternative. As explained above in sections 1.1 and 3.9, the Federal government has an obligation to work collaboratively with the Tribes to facilitate management of treaty trust resources. In contrast to the No Action alternative, the proposed action of issuing a section 10 permit will allow conduct of actions which may contribute to restoration of Treaty trust resources. The proposed action of issuing a permit is directly responsive to the Treaty Trust Doctrine.

5.0 Cumulative Impacts

Other Federal, tribal, and state actions are expected to occur within the Snake River Basin and in the migration corridor between the Snake River and the Pacific Ocean that would affect the fish populations considered in the Proposed Action. State and tribal fisheries occur in Oregon and Washington portions of the Snake River Basin and in the mainstem Columbia River. Land management and water use decisions that affect these populations are made inside and outside the Snake River Basin. There are overarching concerns and legal mandates for the recovery of listed salmon and steelhead populations in the Columbia River Basin, at the same time there are social and cultural needs for sustainable fisheries and sustainable economic use of resources.

There are numerous initiatives by state, Federal, tribal, and private entities designed to restore salmon and steelhead populations. Federal actions for salmon recovery in the Columbia River Basin that are currently underway include initiatives by the Northwest Power and Conservation Council (NPCC) to mitigate impacts of the Federal Columbia River Power System (FCRPS). NPCC initiatives include development of subbasin plans in support of regional planning and recovery efforts. State initiatives include recently passed legislative measures to facilitate the recovery of listed species and their habitats, as well as the overall health of watersheds and ecosystems. Regional programs are being developed that designate priority watersheds and facilitate development of watershed management plans. Several Tribes have developed a joint

restoration plan for anadromous fish in the Columbia River Basin, known as the Wy-Kan-Ush-Mi Wa-Kish-Wit or Spirit of the Salmon plan. All of these regional efforts are expected to help increase salmon and steelhead populations in the action area because of compatible goals and objectives.

The proposed broodstock collection and monitoring actions are responsive to regional plans and coordinated with other salmon recovery activities. The hatchery operations are designed to restore and sustain both the listed natural population and the hatchery-origin component of the population. The monitoring and research on reproductive success is designed to provide information and test options for the use of artificial propagation to restore listed populations. The M&E portions of this project are designed to measure the status and trends of the target populations, which is a measurement of the cumulative affects of all other activities, but M&E actions are not expected to contribute to the cumulative impacts on the species.

Monitoring the affects of management actions is an important aspect of the management actions, and the current proposal is developed in support of basinwide monitoring and salmon restoration. Therefore, the cumulative impacts of NMFS' current Proposed Action are expected to be minor, because of reporting and monitoring requirements that would ensure compatibility with other conservation strategies. Within the action area, there are expected to be beneficial effects on the biological and human environments associated with the application of scientific fishery management to provide for sustainable benefits from restored salmon populations. Monitoring and adaptive management would help ensure that the affected ESUs are adequately protected and would help counter-balance any potential adverse cumulative impacts.

In summary, the proposed actions are designed to benefit the ESU in the following ways:

- The run reconstruction sampling for fall Chinook is designed to answer important questions regarding the relative numbers of hatchery-origin and natural-origin fish in the population, proportion of out-of-subbasin strays, and other population trend and status data to assist managers in making decisions.
- The relative reproductive success study is designed to evaluate the spawning success of natural and hatchery-origin fish and answer important questions about the longer-term effects of supplementing spawning escapement with hatchery fish.
- Collection of fall Chinook broodstock is necessary to support artificial propagation programs that are designed to increase the distribution and abundance of the listed ESU, as well as provide future fishery benefits for tribal and recreational fishers.
- The run reconstruction sampling for steelhead is designed to answer important questions regarding the relative numbers of hatchery-origin and natural-origin fish in the population, proportion of A-run and B-run fish, and other population trend and status data to assist managers in making decisions.
- Removal of hatchery-origin Chinook that originate in out-of-basin propagation programs benefits the natural-origin component of the population and manages the risk of excessive hatchery influence in the population.

6.0 Agencies Consulted

Washington Department of Fish and Wildlife
 U.S. Fish and Wildlife Service
 Idaho Department of Fish and Game
 Bureau of Indian Affairs
 Nez Perce Tribe, Department of Fisheries

7.0 References

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