NOAA's National Marine Fisheries Service (NMFS)
Endangered Species Act (ESA) Section 7 Consultation Biological Opinion and Magnuson–Stevens Act Essential Fish Habitat Consultation

Action Agency: The Bureau of Indian Affairs

Species/ESUs Affected: Snake River spring/summer chinook (*Oncorhynchus tshawytscha*)

Activities Considered: Conduct fishery in the South Fork Salmon River, as described in the two separate Biological Assessments submitted by the Bureau of Indian Affairs on behalf of the of the Nez Perce Tribe and the Shoshone-Bannock Tribes, and in the State of Idaho's section 10 permit 1233.

Consultation Conducted by: The Sustainable Fisheries Division, Northwest Region, NMFS Consultation Number: F/NWR/2003/00575

The Parties propose to conduct fisheries in the South Fork Salmon River consisting of tribal ceremonial and subsistence (C&S) fisheries and non-Indian recreational fisheries directed at adult summer chinook salmon. The Bureau of Indian Affairs submitted biological assessments on behalf of the Nez Perce Tribe on April 28, 2003 (Calica 2003), and on behalf of the Shoshone-Bannock Tribes on April 24, 2003 (LaPointe 2003). Both biological assessments (hereafter referred to as the "BAs") were submitted to NMFS for the purpose of a section 7 consultation under the Endangered Species Act (ESA). The BAs included proposals for other fisheries. However, NMFS declined to consult on these fisheries, other than that proposed in the South Fork Salmon River, because there was insufficient time to complete the necessary consultation prior to the fisheries' proposed start date. NMFS has determined that the proposed fisheries are likely to jeopardize the continued existence of Snake River spring/summer chinook salmon listed under the ESA. This determination is based on impacts to spring/summer chinook salmon resulting from the combination of proposed fisheries in the South Fork Salmon River. Management measures implemented through the Reasonable and Prudent Alternative to limit the take of fish destined for the Poverty Flats and Stolle Meadows index areas lead to a no jeopardy determination.

Approved by: D. Robert Lohn [signature]
D. Robert Lohn, Regional Administrator

Date: 7/3/03

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CONSULTATION HISTORY

Fisheries in the Snake River basin were managed under the Columbia River Fish Management Plan (CRFMP) and two subsequent interim agreements of the parties to *U.S. v. Oregon* from 1988 through July of 1999 when the agreements expired. The CRFMP was a consent decree adopted by the federal court in the case of *U.S. v. Oregon*. NOAA's National Marine Fisheries Service (NMFS) has provided consultation under section 7 of the ESA on proposed fisheries in the Snake River basin since 1992 when Snake River sockeye, spring/summer chinook and fall chinook salmon were first listed under the ESA. While the CRFMP was in effect, the Technical Advisory Committee (TAC) of *U.S. v. Oregon* generally prepared BAs for proposed tribal and state fisheries which were submitted to NMFS by the U.S. Fish and Wildlife Service (USFWS). The TAC BAs considered treaty Indian and non-Indian fisheries within the jurisdiction of the CRFMP, with the exception of Idaho State fisheries in the Snake River basin which were considered separately under section 10 of the ESA. Since expiration of the CRFMP until 2001, the TAC continued to submit BAs to NMFS for fisheries proposed by the Parties, for section 7 consultation. In 2002, while the Bureau of Indian Affairs submitted a BA on behalf of the Nez Perce Tribe, TAC submitted a BA on behalf of the Shoshone-Bannock Tribes, the Confederated Tribes of the Umatilla Indian Reservation and the State of Oregon. In 2003, the BIA submitted separate BAs on behalf of both the Nez Perce Tribe and the Shoshone-Bannock Tribes.

- The first consultation regarding Snake River basin fisheries occurred in 1992. The Shoshone-Bannock Tribes submitted a BA for their fisheries through the U.S. Bureau of Indian Affairs, Fort Hall Agency (BIA 1992). NMFS concluded that these fisheries were not likely to jeopardize the continued existence of Snake River sockeye salmon, spring/summer chinook, or fall chinook salmon.
- In 1993-1998, Snake River biological opinions were expanded to address all fisheries, except those of Idaho, conducted by the parties to *U.S. v. Oregon*. In 1993 and 1994, NMFS issued biological opinions determining that these fisheries were not likely to jeopardize the existence of listed Snake River spring/summer chinook, Snake River fall chinook, or Snake River sockeye salmon (NMFS 1993a; NMFS 1993b; NMFS 1993c; NMFS 1994a; NMFS 1994b).
- In 1995 and 1996, NMFS issued jeopardy biological opinions with reasonable and prudent alternatives describing modified fisheries in the Pahsimeroi River, East Fork Salmon River, Yankee Fork, and the mainstem Salmon River from Sawtooth Hatchery to the Pahsimeroi River (NMFS 1995a; NMFS 1996a).
- In 1997, NMFS issued a jeopardy biological opinion for Snake Basin fisheries with a reasonable and prudent alternative describing a level of take of Snake River spring/summer chinook salmon in the South Fork Salmon River area consistent with the conservation needs of the listed fish (NMFS 1997).
- In 1998, the NMFS issued a jeopardy biological opinion (NMFS 1998a), with a reasonable and prudent alternative describing modified fisheries in the upper Salmon River mainstem and the Pahsimeroi River.

- In 1999, NMFS issued a jeopardy biological opinion (NMFS 1999a), with a reasonable and prudent alternative describing modified fisheries in the upper Salmon River mainstem and the Pahsimeroi River.
- In 2000 and 2001, NMFS issued jeopardy biological opinions (NMFS 2000a NMFS 2001a), with reasonable and prudent alternatives describing modified fisheries in the South Fork Salmon River.
- In 2002, NMFS concluded that the proposed fisheries were not likely to jeopardize the continued existence of sockeye salmon, spring/summer chinook, or fall chinook salmon.

Prior to the 2003 consultation cycle, NMFS proposed a long-term management framework for Snake River fisheries. But, for a variety of reasons, the parties were unable to reach the necessary agreement regarding its implementation. Instead, for 2003, the Bureau of Indian Affairs submitted BAs on on behalf of the Nez Perce Tribe and Shoshone-Bannock Tribes on April 28, 2003 and April 24, 2003, respectively (Calica 2003 and LaPointe 2003) for fisheries in 2003. Some of the fisheries described in the BAs were scheduled to start in late April or early May, thus providing inadequate time for the section 7 review. NMFS wrote the Bureau of Indian Affairs on May 2, 2003 indicating that they would only consult on those fisheries starting after mid-June, in order to have time to complete the necessary consultation (Robinson 2003). The fishery in the South Fork Salmon River was the only fishery meeting this criterion.

As indicated above, NMFS has consulted on Snake River fisheries, including those in the South Fork Salmon River since 1992. NMFS has used the same standards for evaluating fisheries in the South Fork Salmon River for the last several years and again indicated their intention to use the standards in 2003 prior to consultation (Dygert 2003). Those standards are comprised of abondance-based harvest rate schedules for the Poverty Flats and Stolle Meadows areas that define allowable harvest rates regardless of runsize. Unless there is new information suggesting the need to revise these standards, NMFS expects to use them for evaluating future fisheries as well.

BIOLOGICAL OPINION

1.0 DESCRIPTION OF THE PROPOSED ACTION

1.1 Proposed Action

The treaty Indian fisheries contained in the BAs submitted by the BIA are proposed pursuant to the Tribes' treaty fishing rights reserved in the Treaties between the United States and the Tribes. The Bureau of Indian Affairs, acting in its fiduciary role on behalf of the Tribes, seeks these ESA consultations on the basis of the United States' status as plaintiff in United States v. Oregon, as well as the federal government's trust responsibility to the Tribe.

The Nez Perce Tribe and the Shoshone-Bannock Tribes propose to conduct a suite of fisheries described in the BAs submitted on their behalf by the Bureau of Indian Affairs (Calica 2003 and

LaPointe 2003). However, as explained above, the action considered in this Opinion is limited to their respective proposals for fisheries in the South Fork Salmon River. The South Fork Salmon River fisheries will affect ESA-listed Snake River spring/summer chinook salmon.

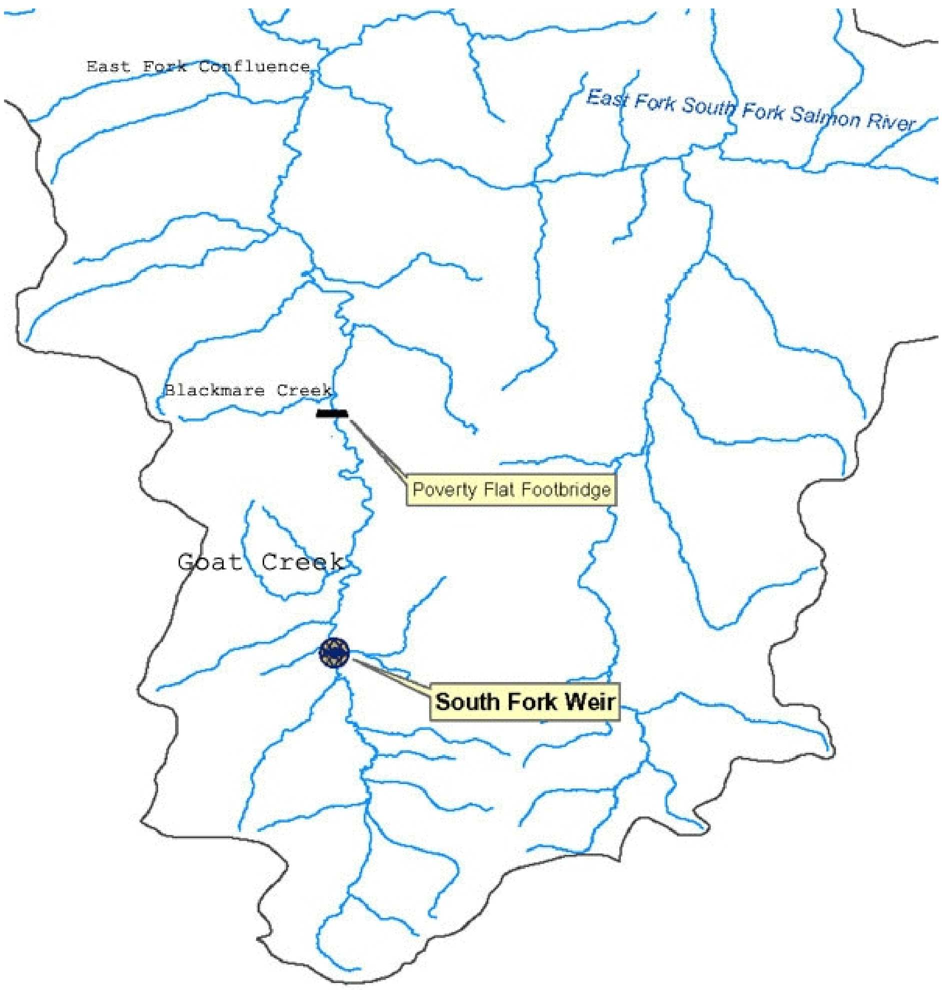

Figure 1. South Fork Salmon River

1.2 Action Area

For purposes of this Opinion, the action area encompasses approximately 30 miles of the South Fork Salmon River, from the confluence of the East Fork South Fork Salmon River to the South Fork Salmon River weir (Figure 1).

1.3 Fisheries Proposed but not Considered

Biological assessments were reviewed in late April for some fisheries scheduled to begin in early May. NMFS subsequently wrote the BIA and tribes indicating it would not consult on some of the early fisheries (Robinson 2003). For the Shoshone-Bannock Tribes, NMFS indicated it would not consult on either the Pahsimeroi or Rapid River fisheries which were scheduled to start in early May. The Shoshone-Bannock's biological assessment also briefly described a steelhead fishery for the Salmon River Basin. The steelhead fishery will also not be considered because insufficient information was provided about the fishery.

The Nez Perce Tribe proposed early season fisheries in the mainstem Snake River, Rapid River, and Lookingglass Creek. These fisheries will also not be considered because of time constrains. The Nez Perce also proposed several fisheries in the Clearwater River subbasin. We have consulted on the Clearwater fisheries in the past and repeatedly concluded that there would be no adverse impacts to listed salmon or steelhead associated with these fisheries. There is no new information that would alter our conclusion for 2003. As a result, we conclude that further consultation on the Clearwater fisheries in unnecessary.

1.4 Description of Fisheries Considered in this Consultation

The proposed fisheries in the South Fork Salmon River would occur between the confluence of East Fork South Fork Salmon River (RM 35.8) and the South Fork Salmon River weir (RM 66.2). There are two main areas in which the Tribes propose fishing in this 30.4 miles stretch of river: the Poverty Flats Area, and the area between Poverty flats and the weir. These areas are managed separately, each having a separate escapement goal and allowable incidental take calculated based on its own harvest rate schedule.

1.4.1 Nez Perce Fishery for South Fork Salmon River Spring/Summer Chinook

The Nez Perce Tribe proposes a 2003 spring/summer chinook subsistence fishery in the South Fork Salmon River during June through August. Areas open to fishing would include the South Fork Salmon River from 10 feet below the weir (RM 66.8) downstream to the confluence with the East Fork South Fork (RM 35.8). Fishing gear permitted will initially include all traditional gear (gaff, dipnet, hoopnet, longbow, spear, and hook and line). The initial fishery would be an indiscriminate fishery utilizing all traditional gear types. Once 93 listed summer chinook are caught, this would be the trigger to restrict gear to dipnet only.

The Nez Perce Tribe proposes to target 3,506 marked hatchery chinook predicted to return to the South Fork Salmon River weir. The fishery as proposed would be expected to take a total of 97 listed fish wild/natural and/or listed hatchery chinook based upon the projected return for listed and unlisted chinook to the weir and to the area from Goat Creek to confluence with the East Fork South Fork. Fishing will be curtailed when the harvest of 3,506 marked hatchery chinook or 97 listed fish wild/natural and/or listed hatchery chinook are reached.

1.4.2 Shoshone-Bannock Fishery for South Fork Salmon River Spring/Summer Chinook

The Shoshone-Bannock Tribes proposed a South Fork Salmon River fishery to occur between mid-June and August 25, 2003. The location of the Shoshone-Bannock tribal spring/summer chinook fishery in the South Fork Salmon River will be from the hatchery weir to the confluence with the East Fork South Fork Salmon River (RM 46). Gear includes the traditional spear with no more than two hooks, hook-and-line, and basket traps and weirs constructed with willows. The Shoshone-Bannock Tribes do not employ selective gear with the live release of captured fish. Selectivity is provided through area and time restrictions.

The Shoshone-Bannock Tribes propose to harvest 2,716 chinook, including 2,536 unlisted hatchery fish and 180 listed fish. The Shoshone-Bannock Tribes propose to limit the incidental take to 37 listed fish in the Poverty Flats area and 143 listed fish in the area between Blackmare Creek and the weir. The Shoshone-Bannock Tribes fisheries will be curtailed once either the total fish or listed fish harvest guidelines in the South Fork Salmon River fishery areas are reached, or when salmon are observed spawning (until the spawning is completed), whichever trigger occurs first. Because of the listed fish trigger, the worst-case is intended to not cause more than 180 listed fish to be harvested within this fishery area, of which no more than 37 will be taken in the Poverty Flats.

1.4.3 The Idaho State Recreational Fishery for South Fork Salmon River Spring/Summer Chinook

Idaho recreational fisheries in the Snake River basin, including the South Fork Salmon River fishery, were considered previously pursuant to a section 10(a)(1)(B) permit application. Permit 1233 authorizes take associated with Idaho fisheries. Although non-Indian fisheries are not subject to this consultation, impacts associated with the Idaho's South Fork Salmon River fishery are considered, in addition to proposed fisheries, as necessary and appropriate.

2.0 STATUS OF SPECIES UNDER THE ENVIRONMENTAL BASELINE

In order to describe a species' status, it is first necessary to define precisely what "species" means in this context. Traditionally, one thinks of the ESA listing process as pertaining to entire taxonomic species of animals or plants. While this is generally true, the ESA also recognizes that there are times when the listing unit must necessarily be a subset of the species as a whole. In these instances, the ESA allows a "distinct population segment" (DPS) of a species to be listed as threatened or endangered. Snake River spring/summer chinook salmon is just such a DPS and, as such, are for all intents and purposes considered a "species" under the ESA.

NMFS developed the approach for defining salmonid DPSs in 1991 (Waples 1991). It states that a population or group of populations is considered distinct if they are "substantially reproductively isolated from conspecific populations," and if they are considered "an important component of the evolutionary legacy of the species." A distinct population or group populations is referred to as an evolutionarily significant unit (ESU) of the species. Hence, Snake River spring/summer chinook salmon constitute an ESU of the species *O. tshawytscha*.

Four salmonid ESUs listed under the ESA are found in the Snake River basin, including Snake River sockeye, spring/summer and fall chinook salmon and steelhead. Snake River sockeye and Snake River fall chinook salmon are not present in the South Fork Salmon River. Snake River steelhead do return to the South Fork Salmon River, but are not present during the proposed fisheries time frame. Only spring/summer chinook salmon will be affected by the proposed fisheries. The substantive elements of the following discussion regarding species status therefore focuses on Snake River spring/summer chinook. A discussion about the status of Snake River fall chinook and steelhead can be found in the NMFS Biological Opinion on 2002 Fall Season Fisheries (NMFS 2002b). A discussion of the status of Snake River sockeye salmon can be found in the All Species Review prepared by the *U.S. v Oregon* Technical Advisory Committee (TAC 1997).

The Snake River spring/summer chinook salmon ESU, listed as threatened on April 22, 1992 (57 FR 14653), includes all natural-origin populations in the Tucannon, Grande Ronde, Imnaha, and Salmon rivers. Some or all of the fish returning to several of the hatchery programs are also listed, including those returning to the Tucannon River, Imnaha, and Grande Ronde hatcheries, and to the Sawtooth, Pahsimeroi, and McCall hatcheries on the Salmon River. Critical habitat was designated for Snake River spring/summer chinook salmon on December 28, 1993 (58 FR 68543) and was revised on October 25, 1999 (64 FR 57399).

2.1 Species/ESUs Life History

The chinook salmon is the largest of the Pacific salmon. The species' distribution historically ranged from the Ventura River in California to Point Hope, Alaska, in North America, and in northeastern Asia from Hokkaido, Japan, to the Anadyr River in Russia (Healey 1991). Additionally, chinook salmon have been reported in the Mackenzie River area of northern Canada (McPhail and Lindsey 1970). Of the Pacific salmon, chinook salmon exhibit the most diverse and complex life history strategies. Healey (1986) described 16 age categories for chinook salmon, combinations of seven total ages with three possible freshwater ages. This level of complexity is roughly comparable to that seen in sockeye salmon, although the latter species has a more extended freshwater residence period and uses different freshwater habitats (Miller and Brannon 1982; Burgner 1991). Gilbert (1912) initially described two generalized freshwater life-history types: "stream-type" chinook salmon, which reside in freshwater for a year or more following emergence, and "ocean-type" chinook salmon, which migrate to the ocean within their first year. Healey (1983, 1991) has promoted the use of broader definitions for ocean-type and stream-type to describe two distinct races of chinook salmon. Healey's approach incorporates life history traits, geographic distribution, and genetic differentiation and provides a valuable frame of reference for comparisons of chinook salmon populations.

The generalized life history of Pacific salmon involves incubation, hatching, and emergence in freshwater; migration to the ocean; and the subsequent initiation of maturation and return to freshwater for completion of maturation and spawning. The juvenile rearing period in freshwater can be minimal or extended. Additionally, some male chinook salmon mature in freshwater, thereby foregoing emigration to the ocean. The timing and duration of each of these stages is related to genetic and environmental determinants and their interactions to varying degrees. Although salmon exhibit a high degree of variability in life-history traits, there is considerable debate regarding the degree to which this variability is shaped by local adaptation or results from the general plasticity of the salmonid genome (Ricker 1972; Healey 1991; Taylor 1991). More detailed descriptions of the key features of chinook salmon life history can be found in Myers et al. (1998) and Healey (1991).

2.2 Overview—Status of the Species/ESUs

To determine a species' status under extant conditions (usually termed "the environmental baseline"), it is necessary to ascertain the degree to which the species' biological requirements are being met at that time and in that action area. For the purposes of this consultation, Snake River spring/summer chinook biological requirements are expressed in two ways: Population parameters such as fish numbers, distribution, and trends throughout the action area; and the condition of various essential habitat features such as water quality, stream substrates, and food availability. Clearly, these two types of information are interrelated. That is, the condition of a given habitat has a large impact on the number of fish it can support. Nonetheless, it is useful to separate the species' biological requirements into these parameters because doing so provides a more complete picture of all the factors affecting Snake River spring/summer chinook salmon survival. Therefore, the discussion to follow will be divided into two parts: Species Distribution and Trends, and Factors Affecting the Environmental Baseline.

2.2.1 Species Distribution and Trends

In its review of population status and the effects of the proposed action on the Snake River spring/summer chinook salmon ESU, NMFS is using developing science from several areas including the Cumulative Risk Initiative (CRI) and Viable Salmonid Populations (VSP) paper. Each of these are described briefly below prior to their application in the subsequent ESU specific status discussion.

<u>Cumulative Risk Initiative</u>

To determine the conservation status of the listed ESUs, NMFS relies in part on the evolving scientific analysis contained in the CRI, which is an ongoing effort of the Northwest Fisheries Science Center (NWFSC 2000, NMFS 2000b). The CRI is designed to provide a standardized assessment of extinction risks and the magnitude of improvements required to mitigate these risks. The CRI provides an analytical structure that begins to allow evaluation of the potential effects of management actions aimed at different life stages or sources of mortality. In general, the CRI therefore provides a tool to assess the degree to which survival improvements in a particular sector can be combined with expected improvements in other sectors to provide the necessary overall improvements required for survival and recovery. The CRI analysis was used extensively in the Federal Columbia River Power System (FCRPS) biological opinion and the Basin Wide Recovery Strategy (referred to as the "All-H" paper throughout this biological opinion) to help resolve critical questions regarding the magnitude of required survival improvements and how those survival improvements may be allocated among the various H's including harvest (NMFS 2000b).

The CRI constructs population models for each species and assesses the risk of extinction for populations and/or for ESUs (depending on the data available). To assess the risk of extinction, the CRI examines the population growth rate from 1980 through the most recent returns, and the year-to-year variability of the population's productivity.

For both ESUs and individual index stocks, the CRI estimates average annual rate of population change or "lambda." Lambda, which incorporates year-to-year variability, is the best summary statistic of how rapidly a population is growing or shrinking. A lambda less than 1.0 means the population is declining; a lambda greater than 1.0 means the population is increasing.

By combining lambda with estimates of environmental variability it is possible to calculate "extinction risk metrics." The CRI assesses the risk of *absolute* extinction, that is, one or no fish for five consecutive years. The analysis also reports the risk of 90% decline in abundance. All extinction metrics are calculated on a 24- and 100-year time frame. For index stocks, where the data represent entire population counts, extinction risks are expressed in terms of the probability of an adult population falling to only one spawner. For ESUs we calculate extinction metrics as the probability of a 90% decline after 24 years and after 100 years, because it is unlikely that entire ESUs have been accurately counted.

The models use survival for each life-stage, which allows a closer examination of the impacts of the various H's (Hydro, Habitat, Hatcheries and Harvest) on population growth and on corresponding extinction risk. The models can help identify the life stages at which changes in survival will yield the largest impact on population growth rates. By running numerical experiments, the modelers can help put in perspective the impact of a particular activity, such as harvest, on the likelihood of extinction for a given population or ESU.

The CRI models project risks of extinction assuming that all factors remain the same as they were during the period considered. CRI analysis are generally available for the 1980-1999 time period. NMFS recognizes that many actions have been taken to improve the survival of these ESUs since 1999, and also recognizes that the base period arguably represents a particularly bad time for ocean survival of most ESUs. In the All-H paper and the FCRPS biological opinion, NMFS has taken into account the management improvements that have been made, as well as the potential benefits from improved ocean conditions of the past few years.

Because the ESA is directed at the conservation of naturally reproducing species and their habitats, NMFS uses the CRI models to determine the risk of extinction of the naturally spawning populations and ESUs. A major source of uncertainty in these analyses is whether and to what extent hatchery-spawned fish contribute to the next generation (certain assumptions must therefore be made about the spawning success of these adults). The uncertainties related to hatchery fish greatly affect estimates of productivity and in turn estimates of extinction risk and the magnitude of survival improvements that may be required. Low and high estimates of lambda were therefore reported based on the assumptions that hatchery-origin fish either contribute nothing to natural production or are equally successful as the natural-origin spawners. The relative productivity of hatchery fish almost certainly varies between populations and falls between the "all or nothing" assumptions.

Estimates of median population growth rate, risk of extinction, and the likelihood of meeting recovery goals are based on population trends observed during a base period that varies between subbasin populations. Population trends are projected under the assumption that all conditions will stay the same into the future.

Viable Salmonid Population

Another approach used for assessing the status of an ESU and its component populations that is being developed by NMFS is described in a paper related to Viable Salmonid Populations (McElhany et. al. 2000). This paper provides guidance for determining the conservation status of populations and ESUs that can be used in ESA-related processes. In this opinion, we rely on VSP guidance in describing the population or stock structure of each ESU and the related effects of the action.

A population is defined in the VSP paper as a group of fish of the same species spawning in a particular lake or stream (or portion thereof) at a particular season which to a substantial degree do not interbreed with fish from any other group spawning in a different place or in the same place at a different season. Because populations as defined here are relatively isolated, it is biologically meaningful to evaluate the risk of extinction of one population independently from any other. Some ESUs may have only one population while others will have many.

The task of identifying populations within an ESU will require making judgments based on the available information. Information regarding the geography, ecology, and genetics of the ESU are relevant to this determination. This is a task that will generally be taken up as part of the recovery planning process. Recovery planning has just recently gotten underway in the Columbia River Basin. As a result, specific guidance on population structure is not yet available for most ESUs, although NMFS has recently provided interim guidance regarding geographic spawning aggregations abundance targets (Lohn 2002). It is nonetheless appropriate in the opinion to consider the potential diversity of each ESU and the status of each of the component stocks.

The VSP paper also provides guidance regarding parameters that can be used for evaluating population status including abundance, productivity, spatial structure, and diversity. In this opinion we consider particularly the guidance related to abundance. The paper provides several rules of thumb that are intended to serve as guidelines for setting population specific thresholds (McElhany et al. 2000). The guidance relates to defining both "viable" populations levels and "critical" abundance levels. Although there are still no specific recommendations regarding threshold abundance levels for the Snake River spring/summer chinook ESU, interim abundance targets have been provided (Lohn 2002). These are discussed in the opinion and are used for evaluating population status and the related effects of the action.

2.2.1.1 Snake River Spring/Summer Chinook Salmon

The present range of spawning and rearing habitat for naturally-spawned Snake River spring/summer chinook salmon is primarily limited to the Grande Ronde, Salmon, Imnaha, and Tucannon Subbasins. Historic populations in the Clearwater Basin were extirpated; spring/summer chinook population in the Clearwater were not included as part of the listed ESU. Most Snake River spring/summer chinook salmon enter individual subbasins from May through September. Juvenile Snake River spring/summer chinook salmon emerge from spawning gravels from February through June (Perry and Bjornn 1991). Typically, after rearing in their nursery streams for about one year, smolts begin migrating seaward in April and May (Bugert *et al*. 1990; Cannamela 1992). After reaching the mouth of the Columbia River, spring/summer chinook salmon probably inhabit nearshore areas before beginning their northeast Pacific Ocean migration, which lasts two to three years. Because of their timing and ocean distribution, these stocks are subject to very little ocean harvest. For detailed information on the life history and stock status of Snake River spring/summer chinook salmon, see Matthews and Waples (1991), NMFS (1991), and 56 FR 29542 (June 27, 1991).

For management purposes, the spring and summer chinook in the Columbia Basin, including those returning to the Snake River basin, have been managed as separate stocks. Historic databases therefore provide separate estimates for the spring and summer chinook components. Table 1 provides the estimated annual return of adult, natural-origin Snake River basin spring and summer chinook salmon returning to Lower Granite Dam since 1979. A preliminary recovery escapement goal for Snake River spring/summer chinook of 31,440 (counted at Ice Harbor Dam) was suggested in NMFS' Proposed Recovery Plan (NMFS 1995b). The interim guidance provided by Lohn (2002) sets target abundance levels for 15 geographic spawning aggregations, but these are not intended to replace the preliminary goals. Final goals will be developed through the recovery planning process as described by Lohn (2002).

Bevan *et al*. (1994) estimated the number of natural-origin adult Snake River spring/summer chinook salmon in the late 1800s to be more than 1.5 million fish annually. By the 1950s, the population had declined to an estimated 125,000 adults. Escapement estimates indicate that the population continued to decline through the 1970s. Returns were variable through the 1980s, but declined further in recent years. Record low returns were observed in 1994 and 1995. Dam counts were modestly higher from 1996-1998, declined again in 1999, but increased in 2000 and 2001. In 2001, the Lower Granite Dam count of 12,475 natural-origin summer was a record high since 1979. In 2002, the Lower Granite Dam count of natural-origin summer chinook was 3,552 (Table 1).

Table 1. Estimates of natural-origin Snake River spring/summer chinook salmon counted at Lower Granite Dam in recent years.

Year	Spring Chinook	Summer Chinook	Total
1979	2,573	2,714	5,287
1980	3,478	2,404	5,882
1981	7,941	2,739	10,680
1982	7,117	3,531	10,648
1983	6,181	3,219	9,400
1984	3,199	4,229	7,428
1985	5,245	2,696	7,941
1986	6,895	2,684	9,579
1987	7,883	1,855	9,738
1988	8,581	1,807	10,388
1989	3,029	2,299	5,328
1990	3,216	3,342	6,558
1991	2,206	2,967	5,173
1992	11,134	441	11,575
1993	5,871	4,082	9,953
1994	1,416	183	1,599
1995	745	343	1,088
1996	1,358	1,916	3,274
1997	2,126	5,137	7,263
1998	5,089	2,913	8,002
1999	1,104	1,584	2,688
2000	3,266	4,067	7,333
2001	16,477	12,475	28,952
2002	34,144	3,552	37,696
2003 Forecast	**13,043**	**5,459**	**18,502**
Recovery Escapement Level			31,440

The Snake River spring/summer chinook salmon ESU consists of 39 local spawning populations (subpopulations) spread over a large geographic area (Lichatowich *et al*. 1993). The number of fish returning to Lower Granite Dam is therefore divided among these subpopulations. The relationship between these subpopulations, and particularly the degree to which straying may occur between these is unknown. It is unlikely that these are all “populations” as defined by McElhany et. al (2000) which requires that they be isolated to the extent that the exchange of individuals among the populations does not substantially affect the population dynamics or extinction risk over a 100-year time frame. The 15 spawning aggregations identified by Lohn (2002) are also not necessarily synonymous with the population concept. Nonetheless, monitoring the status of the subpopulations or spawning aggregations provides a more detailed indicator of the species' status than does the general measure of aggregate abundance.

Seven of these subpopulations have been used as index stocks for the purpose of analyzing extinction risk and alternative actions that may be taken to meet survival and recovery requirements. These were selected primarily on the basis of the availability of long time series of abundance information. Recovery and threshold abundance levels have been developed for the index stocks and serve as reference points for comparison to observed escapements (Table 2). They have also been used for assessment purposes in the PATH (Plan for Analyzing and Testing Hypotheses) process. The recovery levels are abundance-related delisting objectives (C. Toole, NMFS, pers. comm., w/ P. Dygert, NMFS, January 21, 2000). The threshold levels were developed by the Biological Requirements Work Group (BRWG 1994) and represent levels at which uncertainties about processes or population enumeration are likely to become significant, and at which qualitative changes in processes are likely to occur. They were specifically not developed as an indicator of pseudo-extinction or as an absolute indicator of a "critical" threshold. Lohn (2002) provided Interim Abundance Targets for several of these index areas and apart from rounding number differences, these are consistent with the previously identified recovery levels (Table 2). Escapement estimates for the index stocks have generally been well below threshold levels in recent years. However, spawner escapement in 2001 was better than average for all of these index stocks, except Sulphur Creek which is not in the action area. Poverty Flats is the only index within the action area. Johnson Creek is a tributary to the South Fork Salmon River, but will not be affected by the proposed action.

The CRI described above is designed to provide a standardize tool for assessing stock status and survival improvement necessary to meet survival and recovery objectives. For the Snake River spring/summer chinook salmon ESU as a whole, NMFS estimates that the median population growth rate (lambda) over the base period[1] ranges from 0.96 to 0.80, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to the effectiveness of fish of wild origin (Tables B-2a and B-2b in McClure et al. 2000a). NMFS has also estimated median population growth rates and the risk of absolute extinction for the seven spring/summer chinook salmon index stocks,[2] using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (i.e., hatchery effectiveness = 0), the risk of absolute extinction within 100

[1]Estimates of median population growth rate, risk of extinction, and the likelihood of meeting recovery goals are based on population trends observed during a base period beginning in 1980 and including 1999 adult returns. Population trends are projected under the assumption that all conditions will stay the same into the future.

[2] McClure et al. (2000b) have calculated population trend parameters for additional Snake River spring/summer chinook salmon stocks.

years for the wild component ranges from zero for Johnson Creek to 0.78 for the Imnaha River (Table B-5 in McClure et al. 2000a). At the high end, assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of absolute extinction within 100 years ranges from zero for Johnson Creek to 1.00 for the wild component in the Imnaha River (Table B-6 in McClure et al. 2000a).

Table 2. Adult spawners for Snake River spring/summer chinook index stocks, recovery levels identified by NMFS (1995b), and interim critical escapement thresholds suggested by BRWG (1994). Bear Valley, Marsh, Sulphur and Minam are spring chinook index stocks. Poverty Flats and Johnson are summer run index chinook stocks. Imnaha has an intermediate run timing. Estimates for 2002 are not available. Estimates for 2003 are based on preseason projections.

Brood year	Bear Valley	Marsh	Sulphur	Minam	Imnaha	Poverty Flats	Johnson
1979	215	83	90	40	238	76	73
1980	42	16	12	43	183	163	58
1981	151	115	43	50	453	187	106
1982	83	71	17	104	590	192	85
1983	171	60	49	103	435	337	154
1984	137	100	0	101	557	220	39
1985	295	196	62	625	699	341	184
1986	224	171	385	357	479	233	129
1987	456	268	67	569	448	554	177
1988	1109	395	607	493	606	844	320
1989	91	80	43	197	203	261	99
1990	185	101	170	331	173	572	135
1991	181	72	213	189	251	538	146
1992	173	114	21	102	363	578	176
1993	709	216	263	267	1178	866	344
1994	33	9	0	22	115	209	48
1995	16	0	4	45	75	81	20
1996	56	18	23	233	258	135	49
1997	225	110	43	140	502	363	236
1998	372	164	140	122	194	396	119
1999	72	0	0	96	432	153	49
2000	313	65	13	202	447	372	63
2001	712	355	91	573	3041	864	444
2002							
2003						*401*	
Recovery Levels	**900**	**450**	**300**	**450**	**850**	**850**	**300**
BRWG Threshold	**300**	**150**	**150**	**150**	**300**	**300**	**150**

In its recent biological opinion regarding the FCRPS, NMFS summarized the prospects for survival and recovery in terms of the estimated percent change in survival needed to achieve survival and recovery indicator criteria after implementing the hydro survival improvements of the Reasonable and Prudent Alternative (NMFS 2000b). These are then identified as the offsite mitigation performance standards for the FCRPS (see section 9.2.2.2.2 in NMFS 2000b). In general, the low and high values in the table reflect uncertainty about the effectiveness of hatchery spawners in the wild, although the summary statistics do not reflect the full measure of uncertainty in the estimates. These estimates suggest that three of the seven Snake River spring/summer chinook index stocks require no additional survival changes beyond those expected through modification of the hydrosystem under the RPA to meet the survival and recovery indicator criteria, including Johnson Creek and Poverty Flats index area in particular, both in the South Fork Salmon River. The other four index stocks require additional survival improvements ranging from 0 to 66% (Table 3). These survival improvements are expected to be achieved through offsite mitigation activities. Inherent in the overall analysis is the assumption that harvest impacts will remain at the levels reflected in the most recent biological opinions. Generally speaking, increases in the harvest rates, particularly over the long-term, will change these statistics and increase the level of survival improvements required in other sectors. Harvest increases, beyond those assumed, would otherwise simply reflect a further increase of risk to the species.

2.2.2 Factors affecting the Environmental Baseline

Environmental baselines for biological opinions are defined by regulation at 50 CFR 402.02, which states that an environmental baseline is the physical result of all past and present state, Federal, and private activities in the action area along with the anticipated impacts of all proposed Federal projects in the action area (that have already undergone formal or early section 7 consultation). The environmental baseline for this biological opinion is therefore the result of the impacts a great many activities (summarized below) have had on Snake River spring/summer chinook salmon survival and recovery. Put another way, the baseline is the culmination of the effects that multiple activities have had on the species' *biological requirements* and, by examining those individual effects, it is possible to describe the species' status in the action area.

Many of the biological requirements for Snake River spring/summer chinook salmon in the action area can best be expressed in terms of essential habitat features. That is, the ESU requires adequate: (1) substrate (especially spawning gravel), (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) migration conditions (February 16, 2000, 65 FR 7764). The best scientific information presently available demonstrates that a multitude of factors, past and present, have contributed to the decline of west coast salmonids by adversely affecting these essential habitat features. NMFS reviewed much of that information in its recently reinitiated Consultation on Operation of the Federal Columbia River Power System (FCRPS) (NMFS 2000b). That review is summarized in the sections below.

Table 3. Estimated percentage change (i.e., additional improvement in life-cycle survival) needed to achieve survival and recovery indicator criteria after implementing the hydro survival improvements in the RPA. (A value of 26, for example, indicates that the egg-to-adult survival rate, or any constituent life-stage survival rate, must be multiplied by a factor of 1.26 to meet the indicator criteria.)

Snake River spring/summer chinook salmon Spawning Aggregation	Needed Survival Change	
	Low	High
Bear Valley/Elk creeks	0	0
Imnaha River	26	66
Johnson Creek	0	0
Marsh Creek	0	12
Minam River	0	28
Poverty Flats	0	0
Sulphur Creek	0	5

Note: Low and High estimates are based on a range of assumptions, as described in the text.

2.2.2.1 The Mainstem Hydropower System

Hydropower development on the Columbia River has dramatically affected anadromous salmonids in the basin. Storage dams have eliminated spawning and rearing habitat and altered the natural hydrograph of the Snake and Columbia Rivers – decreasing spring and summer flows and increasing fall and winter flows. Power operations cause flow levels and river elevations to fluctuate – slowing fish movement through reservoirs, altering riparian ecology, and stranding fish in shallow areas. The 13 dams in the Snake and Columbia River migration corridors kill smolts and adults and alter their migrations. The dams have also converted the once-swift river into a series of slow-moving reservoirs – slowing the smolts' journey to the ocean and creating habitat for predators. Because the Snake River spring/summer chinook salmon must navigate past eight major hydroelectric projects during their up- and downstream migrations (and experience the effects of other dam operations occurring upstream from their ESU boundary), they are subject to all the impacts described above. For more information on the effects of the mainstem hydropower system, please see NMFS (2000b).

2.2.2.2 Human-Induced Habitat Degradation

The quality and quantity of freshwater habitat in much of the Columbia River Basin have declined dramatically in the last 150 years. Forestry, farming, grazing, road construction, hydrosystem development, mining, and other development have radically changed habitat conditions in the basin. Water quality in streams throughout the Columbia River Basin has been degraded by human activities such as dams and diversion structures, water withdrawals, farming and animal grazing, road construction, timber harvest activities, mining activities, and development. Over 2,500 streams, river segments, and lakes in the Northwest do not meet Federally-approved, state and tribal water quality standards and are now listed as water quality limited under section 303(d) of the Clean Water Act. Tributary water quality problems contribute to poor water quality when sediment and contaminants from the tributaries settle in mainstem reaches and the estuary.

Most of the water bodies in Oregon, Washington, and Idaho on the 303(d) list do not meet water quality standards for temperature. High water temperatures adversely affect salmonid metabolism, growth rate, and disease resistance, as well as the timing of adult migrations, fry emergence, and smoltification. Many factors can cause high stream temperatures, but they are primarily related to land-use practices rather than point-source discharges. Some common actions that cause high stream temperatures are the removal of trees or shrubs that directly shade streams, water withdrawals for irrigation or other purposes, and warm irrigation return flows. Loss of wetlands and increases in groundwater withdrawals contribute to lower base-stream flows which, in turn, contribute to temperature increases. Activities that create shallower streams (e.g., channel widening) also cause temperature increases.

Pollutants also degrade water quality. Salmon require clean gravel for successful spawning, egg incubation, and the emergence of fry. Fine sediments clog the spaces between gravel and restrict the flow of oxygen-rich water to the incubating eggs. Excess nutrients, low levels of dissolved oxygen, heavy metals, and changes in pH also directly affect the water quality for salmon and steelhead.

Water quantity problems are also an important cause of habitat degradation and reduced fish production. Millions of acres of land in the basin are irrigated. Although some of the water withdrawn from streams eventually returns as agricultural runoff or groundwater recharge, crops consume a large proportion of it. Withdrawals affect seasonal flow patterns by removing water from streams in the summer (mostly May through September) and restoring it to surface streams and groundwater in ways that are difficult to measure. Withdrawing water for irrigation, human consumption, and other uses increases temperatures, smolt travel time, and sedimentation. Return water from irrigated fields introduces nutrients and pesticides into streams and rivers. Water withdrawals (primarily for irrigation) have lowered summer flows in nearly every stream in the basin and thereby profoundly decreased the quantity and quality of habitat.

Blockages that stop downstream and upstream fish movement exist at many dams and barriers, whether they are for agricultural, hydropower, municipal/industrial, or flood control purposes. Culverts that are not designed for fish passage also block upstream migration. Migrating fish are often killed when they are diverted into unscreened or inadequately screened water conveyances or turbines. While many fish-passage improvements have been made in recent years, manmade structures continue to block migrations or kill fish throughout the basin.

On the landscape scale, human activities have affected the timing and amount of peak water runoff from rain and snowmelt. Forest and range management practices have changed vegetation types and density which, in turn, affect runoff timing and duration. Many riparian areas, flood plains, and wetlands that once stored water during periods of high runoff have been destroyed by development that paves over or compacts soil – thus increasing runoff and altering its natural pattern.

Land ownership has also played its part in the region's habitat and land-use changes. Federal lands, which compose 50 percent of the basin, are generally forested and influence upstream portions of the watersheds. While there is substantial habitat degradation across all ownerships, in general, habitat in many headwater stream sections is in better condition than in the largely non-Federal lower portions of tributaries (Doppelt *et al*. 1993; Frissell 1993; Henjum *et al*. 1994; Quigley and Arbelbide 1997). In the past, valley bottoms were among the most productive fish habitats in the basin (Stanford and Ward 1992; Spence *et al*. 1996; ISG 1996). Today, agricultural and urban land development and water withdrawals have substantially altered the habitat for fish and wildlife. Streams in these areas typically have high water temperatures, sedimentation problems, low flows, simplified stream channels, and reduced riparian vegetation.

At the same time Snake River spring/summer chinook salmon habitat was being destroyed by water withdrawals, water impoundments in other areas dramatically reduced Snake River spring/summer chinook salmon habitat by inundating large amounts of spawning and rearing habitat and reducing migration corridors, for the most part, to a single channel. Floodplains have been reduced in size, off-channel habitat features have been lost or disconnected from the main channel, and the amount of large woody debris (large snags/log structures) in rivers has been reduced. Most of the remaining habitats are affected by flow fluctuations associated with reservoir management.

The Columbia River estuary (through which all the basin's species – including Snake River spring/summer chinook salmon – must pass) has also been changed by human activities. Historically, the downstream half of the estuary was a dynamic environment with multiple channels, extensive wetlands, sandbars, and shallow areas. The mouth of the Columbia River was about four miles wide. Winter and spring floods, low flows in late summer, large woody debris floating downstream, and a shallow bar at the mouth of the Columbia River kept the environment dynamic. Today, navigation channels have been dredged, deepened, and maintained; jetties and pile-dike fields have been constructed to stabilize and concentrate flow in navigation channels; marsh and riparian habitats have been filled and diked; and causeways have been constructed across waterways. These actions have decreased the width of the mouth of the Columbia River to two miles and increased the depth of the Columbia River channel at the bar from less than 20 to more than 55 feet. Sand deposition at river mouths has extended the Oregon coastline approximately four miles seaward and the Washington coastline approximately two miles seaward (Thomas 1981).

More than 50 percent of the original marshes and spruce swamps in the estuary have been converted to industrial, transportation, recreational, agricultural, or urban uses. More than 3,000 acres of intertidal marsh and spruce swamps have been converted to other uses since 1948 (Lower Columbia River Estuary Program 1999). Many wetlands along the shore in the upper reaches of the estuary have been converted to industrial and agricultural lands after levees and dikes were constructed. Furthermore, water storage and release patterns from reservoirs upstream of the estuary have changed the seasonal pattern and volume of discharge. The peaks of spring/summer floods have been reduced, and the amount of water discharged during winter has increased.

Human-caused habitat alterations have also increased the number of predators feeding on UCR spring chinook salmon and steelhead. For example, researchers estimated that a population of terns on Rice Island (created under the Columbia River Channel Operation and Maintenance Program) consumed six to 25 million out-migrating salmonid smolts during 1997 (Roby *et al.* 1998) and seven to 15 million out-migrating smolts during 1998 (Collis *et al.* 1999). Even after considerable efforts by Federal and state agencies, between 5 and 7 million smolts were consumed in 2001. As another example, populations of Northern pikeminnow (a salmonid predator) in the Columbia River has skyrocketed since the advent of the mainstem dams and their warm, slow-moving reservoirs.

To counteract all the ill effects listed in this section, Federal, state, tribal, and private entities have – singly and in partnership – begun recovery efforts to help slow and, eventually, reverse the decline of salmon and steelhead populations. Nevertheless, while these efforts represent a number of good beginnings, it must be stated that much remains to be done to recover Snake River spring/summer chinook salmon. Full discussions of these efforts can be found in the FCRPS biological opinion (NMFS 2000b).

2.2.2.3 Hatcheries

For more than 100 years, hatcheries in the Pacific Northwest have been used to (a) produce fish for harvest and (b) replace natural production lost to dam construction and other development – not to protect and rebuild naturally produced salmonid populations. As a result, most salmonids returning to the region are primarily derived from hatchery fish. In 1987, for example, 95 percent of the coho salmon, 70 percent of the spring chinook salmon, 80 percent of the summer chinook salmon, 50 percent of the fall chinook salmon, and 70 percent of the steelhead returning to the

Columbia River Basin originated in hatcheries (CBFWA 1990). Because hatcheries have traditionally focused on providing fish for harvest, it is only recently that the substantial adverse effects of hatcheries on natural populations been demonstrated. For example, the production of hatchery fish, among other factors, has contributed to the 90 percent reduction in natural coho salmon runs in the lower Columbia River over the past 30 years (Flagg *et al.* 1995).

NMFS has identified four primary ways hatcheries harm wild-run salmon and steelhead: (1) ecological effects, (2) genetic effects, (3) overharvest effects, and (4) masking effects (NMFS 2000b). Ecologically, hatchery fish can predate on, displace, and compete with natural fish. These effects are most likely to occur when fish are released in poor condition and do not migrate to marine waters, but rather remain in the streams for extended rearing periods. Hatchery fish also may transmit hatchery-borne diseases, and hatcheries themselves may release disease-carrying effluent into streams. Hatchery fish can affect the genetic variability of native fish by interbreeding with them. Interbreeding can also result from the introduction of stocks from other areas. Interbred fish are less adapted to the local habitats where the original native stock evolved and may therefore be less productive there.

In many areas, hatchery fish provide increased fishing opportunities. However, when natural fish mix with hatchery stock in these areas, naturally produced fish can be overharvested. Moreover, when migrating adult hatchery and natural fish mix on the spawning grounds, the health of the natural runs and the habitat's ability to support them can be overestimated because the hatchery fish mask the surveyors' ability to discern actual natural run status.

Currently, the role hatcheries play in the Columbia Basin is being redefined under the Basinwide Salmon Recovery Strategy (Federal Caucus 2000) from simple production to supporting species recovery. These efforts will focus on maintaining species diversity and supporting weak stocks. The program will also have an associated research element designed to clarify interactions between natural and hatchery fish and quantify the effects artificial propagation has on natural fish. The final facet of the strategy is to use hatcheries to create fishing opportunities that are benign to listed populations (e.g., terminal area fisheries). For more detail on the use of hatcheries in recovery strategies, please see the Basinwide Salmon Recovery Strategy.

2.2.2.4 Harvest

Salmon and steelhead have been harvested in the Columbia basin as long as there have been people there. For thousands of years, native Americans have fished on salmon and other species in the mainstem and tributaries of the Columbia River for ceremonial and subsistence use and for barter. Salmon were possibly the most important single component of the native American diet, and were eaten fresh, smoked, or dried (Craig and Hacker 1940; Drucker 1965). A wide variety of gears and methods were used, including hoop and dip nets at cascades such as Celilo and Willamette Falls, to spears, weirs, and traps (usually in smaller streams and headwater areas) (NRC 1996; Drucker 1965).

Commercial fishing developed rapidly with the arrival of European settlers and the advent of canning technologies in the late 1800s. The development of non-Indian fisheries began in about 1830; by 1861, commercial fishing was an important economic activity. The early commercial fisheries used gill nets, seines hauled from shore, traps, and fish wheels. Later, purse seines and trolling (using hook and line) fisheries developed. Recreational fishing began in the late 1800s, occurring primarily in tributary locations (ODFW and WDFW 1998).

Initially, the non-Indian fisheries targeted spring and summer chinook salmon, and these runs dominated the commercial harvest during the 1800s. Eventually the combined ocean and freshwater harvest rates for Columbia River spring and summer chinook salmon exceeded 80 percent and sometimes 90 percent of the run – accelerating the species' decline (Ricker 1959). From 1938 to 1955, the average harvest rate dropped to about 60 percent of the total spring chinook salmon run and appeared to have a minimal effect on subsequent returns (NMFS 1991). Until the spring of 2000 – when a relatively large run of hatchery spring chinook salmon returned and provided a small commercial Tribal fishery – no commercial season for spring chinook salmon had taken place since 1977. Present Columbia River harvest rates are very low compared with those from the late 1930s through the 1960s (NMFS 1991).

Salmonids' capacity to produce more adults than are needed for spawning offers the potential for sustainable harvest of naturally produced (versus hatchery-produced) fish. This potential can be realized only if two basic management requirements are met: (1) enough adults return to spawn and perpetuate the run, and (2) the productive capacity of the habitat is maintained. Catches may fluctuate in response to such variables as ocean productivity cycles, periods of drought, and natural disturbance events, but as long as the two management requirements are met, fishing can be sustained indefinitely. Unfortunately, both prerequisites for sustainable harvest have been violated routinely in the past. The lack of coordinated management across jurisdictions, combined with competitive economic pressures to increase catches or to sustain them in periods of lower production, resulted in harvests that were too high and escapements that were too low. At the same time, habitat has been increasingly degraded, reducing the capacity of the salmon stocks to produce numbers in excess of their spawning escapement requirements.

Fish harvest in the Columbia River basin affects the listed species by incidentally taking them in fisheries that target non-listed species. Snake River spring/summer chinook salmon are not harvested in ocean fisheries (Chapman *et al.* 1995). The largest potential impacts on Snake River spring/summer chinook salmon come from treaty Indian and non-tribal fisheries in the Columbia River mainstem and fisheries in the Snake River Basin (Myers *et al.* 1998). Most take is in the form of catch and retention, mortalities resulting from hooking and release, and mortalities resulting from encounters with fishing gear as a consequence of fishery activities. Two recent opinions describe harvest rate impacts from mainstem Columbia River fisheries accruing to listed salmonids. Both opinions conclude that, due to the constraints set on harvest levels as described in the opinions, the activities associated with the treaty Indian and non-tribal fisheries during the winter/spring/summer and fall seasons were not likely to jeopardize the continued existence of any of the listed species (NMFS 2001a; NMFS 2001b). The development of fishery regimes for the Columbia River mainstem includes evaluation of escapement needs and impacts to Snake River spring/summer chinook salmon.

2.2.2.5 Natural Conditions

Natural changes in the freshwater and marine environments play a major role in salmonid abundance. Recent evidence suggests that marine survival among salmonids fluctuates in response to 20- to 30-year cycles of climatic conditions and ocean productivity (Hare *et al*. 1999). This phenomenon has been referred to as the Pacific Decadal Oscillation; this has also been referred to as the Bidecadal Oscillation (Mantua *et al*. 1997). In addition, large-scale climatic regime shifts, such as El Niño, appear to change ocean productivity. During the first part of the 1990s, much of the Pacific Coast was subject to a series of very dry years. More recently, severe flooding has adversely affected some stocks (e.g., the low returns of Lewis River bright fall chinook salmon in 1999).

A key factor affecting many West Coast stocks—including Snake River spring/summer chinook salmon—has been a general 30-year decline in ocean productivity. The mechanism whereby stocks are affected is not well understood, partially because the pattern of response to these changing ocean conditions has differed among stocks—presumably due to differences in their ocean timing and distribution. It is presumed that survival is driven largely by events occurring between ocean entry and recruitment to a subadult life stage (NMFS 2000b).

Salmon and steelhead are exposed to high rates of natural predation, particularly during freshwater rearing and migration stages. Ocean predation may also contribute to substantial natural mortality, although it is not know to what degree. In general, salmonids are prey for pelagic fishes, birds, and marine mammals, including harbor seals, sea lions, and killer whales. There have been recent concerns that the rebound of seal and sea lion populations – following their protection under the Marine Mammal Protection Act of 1972 – has caused a substantial number of salmonid deaths.

2.2.2.6 Summary

In conclusion, given all the factors for decline—even taking into account the corrective measures being implemented—it is still clear that the Snake River spring/summer chinook salmon ESU's biological requirements are currently not being met under the environmental baseline. Thus their status is such that there must be a substantial improvement in the environmental conditions of their habitat (over those currently available under the environmental baseline). Any further degradation of the environmental conditions could have a large impact because the ESU is already at risk. In addition, there must be efforts to minimize impacts caused by dams, harvest, hatchery operations, habitat degradation, and unfavorable natural conditions.

3.0 EFFECTS OF THE ACTION

The purpose of this section is to identify what effects NMFS' issuance of an incidental take statement will have on endangered Snake River spring/summer chinook salmon. To the extent possible, this will include analyzing effects at the population level. Where information on Snake River spring/summer chinook salmon is lacking at the population level, this analysis assumes that the status of each affected population is parallel to that of the ESU as a whole. The method NMFS uses for evaluating effects is discussed first, followed by discussions of the general effects fishery activities are known to have.

3.1 Evaluating the Effects of the Action

3.1.1 Applying ESA section 7(a)(2) standards

Over the course of the last decade and hundreds of ESA section 7 consultations, NMFS developed the following four-step approach for applying the ESA section 7(a)(2) standards when determining what effect a proposed action is likely to have on a given listed species. What follows here is a summary of that approach; for more detail please see *The Habitat Approach: Implementation of Section 7 of the Endangered Species Act for Actions Affecting the Habitat of Pacific Salmonids* (NMFS 1999b).

1. Define the biological requirements and current status of the listed species.

2. Evaluate the relevance of the environmental baseline to the species' current status.

3. Determine the effects of the proposed or continuing action on listed species and their habitat.

4. Determine whether the species can be expected to survive with an adequate potential for recovery under (a) the effects of the proposed (or continuing) action, (b) the effects of the environmental baseline, and (c) any cumulative effects—including all measures being taken to improve salmonid survival and recovery.

Information related to steps one and two is discussed in preceding sections. Information related to steps three and four are is discussed below.

The fourth step above requires a two-part analysis. The first part focuses on the action area and defines the proposed action's effects in terms of the species' biological requirements in that area (i.e., impacts on essential habitat features). The second part focuses on the species itself. It describes the action's impact on individual fish—or populations, or both—and places that impact in the context of the ESU as a whole. Ultimately, the analysis seeks to answer the questions of whether the proposed action is likely to jeopardize a listed species' continued existence or destroy or adversely modify its critical habitat.

3.2 Effects on Habitat

Previous sections have described the habitat of the Snake River spring/summer chinook salmon, the essential features of that habitat, and depicted its present condition. The discussion here focuses on how those features are likely to be affected by the proposed actions.

The fishing activities will likely occur in a relative small area, an approximately 30-mile stretch of the South Fork Salmon River, from the confluence of the East Fork South Fork Salmon River to 100 yards from the South Fork Salmon River weir. The fishing activities will be limited to the time of active migration of returning spawners and will stop once spawning starts. Therefore there will be no direct effects on redds or spawning activity. The type of gear and method of fishing in the proposed fisheries are minimally intrusive in terms of their effect on habitat. None of them will measurably affect any of the 10 essential fish habitat features listed earlier (i.e., stream substrates, water quality, water quantity, food, streamside vegetation, etc.). The proposed activities are also of short duration. Therefore, NMFS concludes that the proposed activities are unlikely to have an adverse impact on Snake River spring/summer chinook salmon habitat, and thus will have little, if any, effect on the contribution of that habitat to the species' likelihood of survival and recovery.

3.3 Effects on Snake River Spring/Summer Chinook Salmon ESU

3.3.1 Factors to Be Considered

Fisheries may affect salmonid ESUs in several ways which have bearing on the likelihood of continued survival of the species. Immediate mortality effects accrue from the hooking or netting and subsequent retention of individual fish — those effects are considered explicitly in this opinion.

In addition, mortality may occur as a result of catch and release requirements which may be implemented to reduce mortalities to listed fish through live release. The catch-and-release mortality rate varies for different gear types, different species, and different fishing conditions, and those values are often not well known. Catch-and-release mortality rates have been estimated from available data and applied by TAC in the calculation of impacts to fish listed and proposed for listing evaluated in this consultation. The TAC applies a 10% incidental mortality rate to salmon caught and released during recreational fishing activities. The TAC also applies a 1% incidental mortality rate to salmon caught and released using dipnets.

One of the primary considerations in evaluating fisheries is the demographic effects on the survival and recovery of listed species. An important concern for many of the ESUs is the small size of the populations making up the ESU. Even when population trends are stable, a small population may be at substantial risk of extinction due to environmental, demographic, or genetic stochasticity. The analysis of the proposed South Fork Salmon River fisheries must be made in the context of whether the removal of fish from the upstream migrating salmonids will measurably reduce the sizes of extant populations and increase the risk of extinction of the ESU due to small constituent population sizes. NMFS has not yet defined the population structure of the Snake River spring/summer ESU consistent with the formal definitions in the Viable Salmonid Populations paper (McElhany et al. 2000). However, NMFS previously used the 39 subpopulations identified in Lichatowich et al. (1993), and more recently identified 15 spawning aggregations for use on an interim basis (Lohn 2002). Until there is new information that better defines the population structure of the ESU, NMFS believes that it is important to continue to maintain, wherever possible, the stock structure that represents the inherent diversity of the ESU. The Poverty Flats and Stolle Meadows subpopulations are important to the ESU as a whole.

3.3.2 Effects of the Proposed Action

The South Fork Salmon River fishery will target unlisted hatchery-origin fish returning to the South Fork Salmon River hatchery weir in numbers exceeding the needs of the propagation program. The expected return of unlisted hatchery-origin fish to the area that are available for harvest is 7,011 fish based on the preseason forecast of 8,411 and the hatchery escapement objective of 1,400 fish. Areas open to fishing would include the South Fork Salmon River weir (RM 66.2) downstream to the confluence with the East Fork South Fork (RM 35.8).

The Nez Perce Tribe, the Shoshone-Bannock Tribes and Idaho State have all proposed fisheries in the South Fork Salmon River. The Nez Perce Tribe and Shoshone-Bannock Tribes propose to fish from the weir down through the Poverty Flats areas to the confluence with the East Fork South Fork. The Nez Perce Tribe propose to harvest 3,506 unlisted summer chinook with an incidental take of up to 97 listed fish in the South Fork Salmon River below the weir in 2003, but do not define where the take will occur and do not provide measures to limit the take of listed fish in the Poverty Flats area. The Shoshone-Bannock Tribes propose to harvest 2,536 unlisted summer chinook with an incidental take of up to 180 total listed fish in the South Fork Salmon River below the weir in 2003, and propose to limit the lethal take of listed fish to 37 listed fish while fishing below the Poverty Flats bridge. The take of 37 listed fish while fishing below Poverty Flats Bridge would include 8 listed fish destined to spawn in the Poverty Flats index area. Idaho State proposes to harvest 3,506 unlisted summer chinook with an incidental take of up to 74 total listed fish in the South Fork Salmon River, between the Poverty Flats Bridge and the South Fork Salmon River weir. The proposed State fishery is limited geographically to the upper end of the actio area and will presumably have no effect on fish returning to the Poverty Flats area. The combined State and tribal proposals for harvest in the South Fork Salmon River would total 9,548 unlisted fish, along with an incidental take of 351 listed fish. Also, the combined proposed harvest of unlisted fish (9,548) actually exceeds the preseason forecast (8,411).

NMFS has identified and managed for five breeding units or subpopulations in the South Fork Salmon River (BRWG 1994; Bevan et al. 1994; NMFS 1995b; NMFS 2000a; NMFS 2001a) including:

- lower mainstem; South Fork Salmon River mouth to Blackmare Ck. (including Poverty Flats)
- upper mainstem; Blackmare Ck. to Stolle Meadows
- Secesh River
- East Fork South Fork
- Johnson Ck.

The Secesh, East Fork South Fork, and Johnson Creek are tributaries of the lower mainstem South Fork. These are natural production areas. Hatchery fish are also released into Johnson Creek using Johnson Creek-origin broodstock. The proposed tribal fisheries will occur above the confluence with these tributaries; fish returning to these tributaries are therefore unlikely to be affected by the proposed fisheries. The effects of the fisheries are therefore limited to two of the five subpopulations in the South Fork Salmon River. None of the other 34 subpopulations located outside of the South Fork Salmon River will be adversely affected by the fisheries.

It is unclear whether these units would all be distinguished as “populations” as defined in NMFS’ recent Viable Salmonid Population paper (McElhany et al. 2000). Historically, it is probable that fish returning to the Poverty Flats area on the lower mainstem and the Stolle Meadows area on the upper mainstem were distinct as there is geographic separation between them that is magnified by elevation differences. There are also run timing differences between these stocks. Earlier spawn timing at Stolle Meadows is evident. The Poverty Flat and Stolle Meadows stocks do not now show consistent genetic differences. It is clear that they have been affected by past events and practices, particularly the early brood stock and hatchery management practices at the South Fork Hatchery. These past practices have likely reduced differences between the populations within the mainstem South Fork, but have not resulted in their complete homogenization (pers. com, R. Waples, NMFS June 2, 2000, P Dygert, NMFS). NMFS believes that it is important to continue to maintain as much of the inter-stock diversity as possible as part of an overall recovery strategy. NMFS therefore concludes that the fisheries should be managed in a way that accounts for the relative status of the Poverty Flats and Stolle Meadows stocks. To accomplish this objective, NMFS has developed during recent consultations, separate harvest rate schedules for the Poverty Flats and Stolle Meadows summer chinook stocks of the South Fork Salmon River (NMFS 2000a, 2001a and 2002b).

On March 27, 2003, NMFS wrote a letter to the Nez Perce Tribe, the Shoshone-Bannock Tribes and Idaho State describing the criteria that would be used in evaluating fishery proposals in the

South Fork Salmon River (Dygert 2003). These are the same criteria NMFS has used in recent years, and, pending development of new information, anticipates using for the foreseeable future.

NMFS developed separate harvest rate schedules for the Poverty Flats and Stolle Meadows subpopulations of the South Fork Salmon River consistent with it objective to maintain the integrity of the two subpopulations (NMFS 2000a, 2001a, and 2002b). The first harvest rate schedule (Table 4) depends on the expected return of natural-origin spawners to the Poverty Flats index area; the second (Table 5) depends on the forecast return to the weir of natural-origin and hatchery-origin supplementation fish and the resulting expected number that would be passed above the weir as a result of the hatchery/genetic management protocol. Tables 4 and 5 are tied to the suggested recovery and threshold abundance levels. These threshold abundance levels should ultimately be reviewed and revised if necessary, but for now provide reasonable benchmarks of known origin that can be used to scale the fisheries. These schedules provide a framework for evaluating proposed fisheries

In the following discussion NMFS describes the anticipated impacts based on preseason estimates of expected returns provided in the biological assessment by the BIA (Calica 2003 and LaPointe 2003) and IDFG (Marshall 2003). However, it is important to note that the preseason return estimates will be updated inseason based on fish counts at the weir and other information. The resulting harvest rate and the associated numerical limit on take may change inseason as determined by the harvest rate schedule. However, the harvest rate schedule in Tables 4 and 5 will apply and define both, the overall take limits and how these may be distributed between the two fishing areas.

The projected return to the Poverty Flats area is 401, compared to suggested lower threshold and recovery levels of 300 and 850, respectively (Table 2). The expected return to Poverty Flats of 401 spawners in 2003 is greater than the last 5-year average returns (208) and higher than the contributing brood years, or 352 and 178 for 1998 and 1999, respectively (Table 2).

The upper mainstem South Fork, particularly the Stolle Meadows area above the hatchery weir, is in relatively better shape. The area above the weir is managed for natural production, but is supplemented with a uniquely identified group of listed hatchery-origin fish, each of which had at least one natural-origin parent. The group of fish being targeted in the fishery is unlisted hatchery-origin fish that are the product of two hatchery-origin parents. The unlisted fish are visually distinguishable by an adipose fin clip. The existing propagation program protocol requires that a limited number of natural-origin and listed hatchery-origin fish (32 adults from each group) be taken back to the hatchery to maintain the on-station brood stock program. The remaining fish are passed above the weir to spawn naturally, subject to the condition that no more than half of the fish going above the weir will be from the listed supplementation group. No “reserve” group fish (hatchery x hatchery crosses), which are the target of the proposed fisheries, are allowed to pass above the weir.

Table 4. Harvest rate schedule for the Poverty Flats index area. Interim threshold levels are 300 and 850.

% of Goal	Expected Return of N-O* Fish to Spawning Area	Harvest Rate - % of N-O Fish	Harvest - # of N-O Fish
	<50		0
	51 - 150		2
	151 - 300	2%	2 - 6
< 50%	301 - 425	4%	12 - 17
51% - 75%	426 - 638	6%	26 - 38
76% - 108%	639 - 918	8%	51 - 73
> 108%	> 919	35% (of margin > 918)	> 73

* Natural-origin

Table 5. Harvest rate schedule for the upper mainstem South Fork (Stolle Meadows). Interim threshold levels are 300 and 690.

% of Goal	Expected Return Above Weir	Harvest Rate - % of Listed Fish	Harvest - # of N-O Fish
	<50		
	51 - 150		
< 50%	151 - 345	4%	
51% - 75%	345 - 518	9%	
76% - 112%	519 - 773	12%	
> 112%	> 773	35% (of margin > 773)	

* Natural-origin

The effect of using these harvest rate schedules is that fishing opportunity in the lower mainstem area is relatively limited. Given the anticipated return of 401 fish, the allowable harvest of natural-origin fish destined for the Poverty Flats index area is 16 fish (0.04 x 401 = 16) (Table 4). However, since fish destined for the upper area migrate through Poverty Flats, the lethal take limit of natural-origin fish on Poverty Flats would be 76 fish (i.e. 16/[401/(61 + 401 + 206 + 1173)] = 76). The lethal take of 76 listed fish from Poverty Flats would presumably include two (2) listed fish destined to below Miners Creek, 16 fish that were destined for Poverty Flats, 10 listed fish that were passing through Poverty Flats as they head for the section of river between Poverty Flats and the South Fork Salmon River weir, and 47 listed fish destined for Stolle Meadows (above the weir). This calculation is conservative in that it assumes that there are no timing differences between listed fish from the respective areas and that they are therefore equally likely to be caught in fisheries in the lower area. In fact, there is reason to believe that fish returning to the Poverty Flats area have somewhat later return timing and may be more likely to hold in areas below the Poverty Flats index area. The probability of taking a fish destined for Poverty Flats is likely therefore lower than is reflected by the above assumption that catch is proportional to relative abundance. Nonetheless, that is the assumption used; once 76 listed fish are taken from the Poverty Flats area, it would be closed to further harvest.

Given the anticipated preseason returns of listed natural and listed hatchery-origin fish to the weir (450 and 723, respectively), the expected number of fish over the weir is 900 and the allowable harvest rate, derived from the above schedule, is 12% of 773 plus 35% of 127 (900-773) or 137 listed fish (Table 5). Because there are an additional 260 listed natural-origin fish destined to return to the area between Poverty Flats Bridge and the South Fork trap, the adjusted allowable catch while fishing above Poverty Flats and below the weir is 137/[900/(260+900)] = 177 fish. The proposed total take associated with the combined state and tribal fisheries in the South Fork Salmon River fisheries is 351 listed fish. This compares to an allowable take of 177 listed fish based on application of the two abundance based harvest rate schedules.

4.0 Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions not involving Federal activities that are reasonably certain to occur within the action area subject to this consultation. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

State, tribal and local government actions will likely be in the form of legislation, administrative rules or policy initiatives. Government and private actions may encompass changes in land and water uses — including ownership and intensity — any of which could impact listed species or their habitat. Government actions are subject to political, legislative, and fiscal uncertainties. These realities, added to the geographic scope of the action area which encompasses numerous government entities exercising various authorities and the many private landholdings, make any analysis of cumulative effects difficult and speculative. For more information on the various efforts being made at the local, tribal, state, and national levels to conserve Snake River spring/summer chinook salmon and other listed species, see NMFS (2002).

Non-Federal actions are likely to continue affecting listed species. The cumulative effects in the action area are difficult to analyze because of the different resource authorities in the action area, the uncertainties associated with government and private actions, and the changing economies of the region. Whether these effects will increase or decrease is a matter of speculation; however, based on the trends identified in the baseline, the adverse cumulative effects are likely to increase. Although state, tribal and local governments have developed plans and initiatives to benefit listed fish, they must be applied and sustained in a comprehensive way before NMFS can consider them “reasonably foreseeable” in its analysis of cumulative effects.

5.0 INTEGRATION AND SYNTHESIS OF EFFECTS

The proposed fisheries considered in this Opinion would occur in a 30 mile stretch of the South Fork Salmon River. The fisheries would target over 7,000 unlisted hatchery summer chinook expected to return to the McCall Hatchery. Because of the geographic limits, the effects of the fishery would be limited to two of the five subpopulations that have been tentatively identified in the South Fork Salmon River, and two of 39 subpopulations identified in the Snake River spring/summer chinook ESU as a whole. These subpopulations are nonetheless important to the ESU. The South Fork Salmon River is a key production area for the summer component of the ESU and is therefore essential to the overall life history diversity of the ESU. Similarly, as discussed in this Opinion, NMFS concluded that the Poverty Flats and Stolle Meadows subpopulations are distinct, and that it is important to manage to maintain the diversity of those subpopulations consistent with the guidance contained in NMFS’ paper on Viable Salmonid Populations. As a result, NMFS proposed in its pre-consultation guidance to the parties (Robinson 2003) that the two subpopulations be managed separately based on their independent return projections. NMFS’ reservations regarding the proposed fisheries result, in part, because the fisheries, in aggregate, are not sufficiently protective of the Poverty Flats subpopulation.

In reviewing the status of the species and environmental baseline NMFS considered, among others things, the results of the CRI analysis and guidance provided by the Viable Salmonid Populations paper. The Poverty Flat and Johnson Creek index areas, both located in the South Fork Salmon River, were analyzed using the CRI procedures. For both the analysis indicated that the percent change in life-cycle survival necessary to meet survival and recovery criteria was 0 (Table 3). The CRI analysis used data through 1999 and therefore did not include recent years with higher returns. The conclusions of the CRI analysis were therefore likely conservative indicating that the prospects for the recovery of these index populations met established criteria.

The Viable Salmonid Populations paper emphasizes the need to maintain the life-history diversity of an ESU by maintaining its population structure. The paper also recommends using abundance indicators to evaluate the status of the populations. NMFS’ pre-consultation guidance regarding the use of the separate harvest rate tables is consistent with the paper in that it manages the subpopulations independently and scales allowable harvest based on returns relative to interim recovery and critical threshold abundance levels. As explained in the Opinion, the critical thresholds used in the analysis (Table 2) were intended to represent levels at which uncertainties about processes or population enumeration are likely to become significant, and at which qualitative changes in processes are likely to occur. There were specifically not developed as an indicator of pseudo-extinction or as an absolute indicator of a “critical” threshold.

The harvest rate schedules developed by NMFS are consist with the Viable Salmonid Populations recommendations. As a matter of policy, NMFS has an interest in providing harvest opportunity where possible so long as it is consistent with conservation requirements. The Poverty Flats harvest rate schedule provides an example (Table 4) where NMFS has defined the balance between harvest opportunity and its conservation objectives. For runs less than the critical threshold, the allowable harvest ranges from 0 to 2% of the return. For runs between the critical and recovery thresholds, the harvest rate ranges between 4% and 8%. For runs which exceed the recovery threshold, harvest is limited to 35% of the fish over the threshold thus providing some additional harvest opportunity, and considerable opportunity for escapements to exceed the recovery threshold. The schedule is therefore designed to explore population dynamics when returns are high.

Fisheries in the South Fork are planned initially based on the preseason forecasts of runsize. Preseason expectations may be modified inseason based on counts at Lower Granite Dam or at the hatchery weir. The allowable harvest is adjusted up or down based on the updated runsize information. Because fisheries are located in a terminal area and managed inseason, the fishery can be managed with relative precision to meet harvest rate objectives.

NMFS evaluated the state and tribal fisheries in the South Fork by comparing the aggregate of the proposed fisheries against the harvest rate schedules described above. The three fishery proposals (state and two tribal) were poorly coordinated. In combination they propose to catch over 9,500 unlisted hatchery fish which exceeds the number of fish available for harvest (approximately 7,000 unlisted fish). More importantly, the proposed harvest levels could exceed that allowed in the Poverty Flats index area, an outcome that is critical to the conclusion of this Opinion. Although the state proposes to limit their fishery to the area above Poverty Flats, both tribal fisheries would include the Poverty Flats area. The resulting harvest rate in the area could be as high as 7% compared to a limit of 4% based on the expected return of 401 and management provisions of Table 4.

6.0 CONCLUSION

After reviewing the current status of the Snake River spring/summer chinook salmon ESU considered in this opinion, the environmental baseline for the action area, the effects of the proposed fisheries as set forth in the biological assessments, and the cumulative effects, it is NMFS’ biological opinion that the fisheries proposed by the Nez Perce Tribe and Shoshone-Bannock Tribes, in combination with the State of Idaho’s recreational fisheries, are likely to jeopardize the continued existence of Snake River spring/summer chinook salmon. This determination is based on impacts on spring/summer chinook salmon resulting from the combination of proposed fisheries in the South Fork Salmon River, which exceed the incidental take established by previously defined criteria (NMFS 2000a)

7.0 REASONABLE AND PRUDENT ALTERNATIVE

Regulations implementing section 7 of the ESA (50 CFR 402.02) define reasonable and prudent alternatives as alternative actions, identified during formal consultation, that: (1) can be implemented in a manner consistent with the intended purpose of the action; (2) can be implemented consistent with the scope of the action agency's legal authority and jurisdiction; (3) are economically and technologically feasible; and (4) would, NMFS believes, avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat.

The key elements of the reasonable and prudent alternative were outlined in the previous synthesis section. The Poverty Flats and Stolle Meadows summer chinook subpupulations in the South Fork Salmon River will be managed separately using the harvest rate schedules presented in subsection 3.2.2. Table 4 and Table 5 define the allowable level of harvest mortality for fish returning to the Poverty Flats index area and the Stolle Meadows areas, respectively. These take limits are defined using preseason forecast information, but will be adjusted inseason based on updated information on run size when and where possible. Use of tables 4 and 5 also satisfy the four above described criteria which define the Reasonable and Prudent Alternative.

Given this years' preseason run size information, the incidental take limit for listed fish returning to the Poverty Flats index area is 4% of the run or 16 fish. The total combined allowable incidental mortality rate on listed fish returning to the South Fork weir is 137 listed fish based on the forecast return and supplementation protocol which will result in 900 fish being passed over the weir.

Because of the relative status of the stocks, there is less opportunity to fish on the Poverty Flats area. Based on the relative abundance of listed fish expected to return to or pass through the Poverty Flats area, the numerical limit on the harvest of listed fish in the area below the Poverty Flats Pack Bridge is 37 fish (including 16 listed fish destined for Poverty Flats), and the total allowed incidental take is 195 listed fish (including the 37 listed fish allowed while fishing in Poverty Flats). Once the take of 37 is reached in Povery Flats, the area below the Poverty Flats Pack Bridge shall be closed. Once the total incidental take of 195 listed fish is reached, all fisheries in the South Fork Salmon River will be closed.

In considering the question of jeopardy it is also necessary to consider the proposed fisheries in the broader context of the ESU as a whole. As described above, proposed fisheries will be limited to the geographic areas in the Snake River basin that are influenced by hatchery production. As a result, only two of the spring/summer chinook salmon subpopulations will be subject to any harvest associated with the proposed action. The Poverty Flats area has been the focus of much of this opinion, but it is one of five stocks identified in the South Fork Salmon River which is, in turn, one basin of a much larger ESU. In the hatchery production areas where harvest will occur, harvest will be limited and represent a small portion of the listed fish returning to those particular areas. Management measures implemented through the Reasonable and Prudent Alternative to limit the take of fish destined for the Poverty Flats index area will reduce proposed harvest rates that were potentially as high as 7.1% to just 16 listed fish or 4% of the run. Taken from this broader perspective, the limited level of harvest proposed represents a reasonable accommodation for treaty Indian ceremonial and subsistence fisheries that will not substantially affect the species' prospects for survival and recovery. Based on these considerations, NMFS concludes that fisheries that are managed consistent with provisions of the South Fork Salmon River framework are not likely to jeopardize the continued existence of Snake River spring/summer chinook.

8.0 INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement (ITS).

The measures described below are non-discretionary; they must be undertaken by the action agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The action agency has a continuing duty to regulate the activity covered in this incidental take statement. If the action agency (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the agency must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement [50 CFR §402.14(I)(3)].

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

8.1 Amount or Extent of Incidental Take Anticipated

No Snake River sockeye, fall chinook salmon or steelhead are expected to be taken as a result of the 2003 fisheries proposed for the South Fork Salmon River.

The amount of anticipated incidental take of Snake River spring/summer chinook is expressed in terms of mortality rates, as a percentage of the total runsize, according to the proposed abundance-based schedule described in the plan and summarized in Tables 4 and 5. Allowable take is defined this way so as to be responsive to possible changes in runsizes based on inseason information. Allowable harvest rates may be lower or higher depending on inseason adjustments, but will be determined by the application of runsize information to Tables 4 and 5. The incidental take limit specified below are base on preseason runsize estimates.

This consultation specifically considers proposed Nez Perce Tribe and Shoshone-Bannock Tribes tribal fisheries on the South Fork Salmon River. However, the state of Idaho has also proposed fisheries in the South Fork Salmon River which are authorized through section 10 permit 1233, subject to the requirement that the state fisheries be in compliance with total incidental take limits for the combined fisheries. This consultation therefore defines the take limit for the South Fork fishery that is applied to the tribal fisheries through this consultation and the state of Idaho through permit 1233.

Based on preseason information, the anticipated take for natural-origin fish destined to return to the Poverty Flats index area is 16 fish as defined by the harvest rate schedule in Table 4 of this Opinion. The anticipated take for listed fish returning to the South Fork weir based on preseason expectations is 137 listed fish as defined by the harvest rate schedule in Table 5 of this Opinion. There are additional natural-origin fish destined to return to areas below Poverty Flats, and the area between Poverty Flats and the weir. Based on preseason expectations and take limits defined by Tables 4 and 5, an additional 42 listed fish may be taken in the proposed fisheries.

8.2 Effect of the Take

In this Opinion, NMFS has determined that the level of take anticipated with the Reasonable and Prudent Alternative is not likely to jeopardize the continued existence of listed Snake River spring/summer chinook salmon.

8.3 Reasonable and Prudent Measures

1 The tribes shall manage their fisheries to minimize harvest impacts to listed salmonids consistent with their proposals.

2 The tribes shall conduct sufficient monitoring and enforcement activities to allow the accurate and timely enumeration of observed and estimated mortalities of listed hatchery-origin and natural-origin fish.

8.4 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the action agencies must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary. To implement the Reasonable and Prudent Measure # 1, the BIA, through the Nez Perce Tribe and the Shoshone-Bannock Tribes shall:

1a. Manage their fisheries in the South Fork Salmon River to limit their harvest of listed summer chinook salmon to the levels described in the biological assessment, as modified by this biological opinion. Inseason management actions taken during the course of the fisheries must be consistent with the harvest objectives described and summarized in this Opinion.

1b. Continuously monitor returns to these locations by contacting facility managers and other fishery management personnel as needed. The allowable catch in the proposed fisheries is dependent upon the expected return to the individual fishery locations. Expected returns can be refined as the season progresses, particularly as fish start arriving at Lower Granite Dam and the South Fork Salmon River hatchery weir. TAC shall update return projections inseason as information is available, and shall report this information to NMFS, the tribes the and State of Idaho as soon as the projections are updated.

1c. Curtail their South Fork Salmon River fishery when the guidelines for hatchery-origin and natural-origin adult harvest based on projected returns have been reached.

1d. Take measures to reduce the deliberate illegal take of listed fish. These measures shall include extensive presence of law enforcement personnel representing the appropriate co-manager(s) at the fishing area, including areas which are not open to fishing but may experience illegal effort. Enforcement personnel and conservation officers of each entity shall report the incidental take of adult and juvenile listed salmon in the fisheries. Co-managers' personnel shall conduct creel surveys or other forms of angler contact to monitor the possible incidence of illegal harvest activity. Enforcement personnel and conservation officers of each entity shall coordinate with the other co-managers to best assure adequate coverage of fishery areas, and shall share, on a timely basis, information on potential enforcement issues obtained during enforcement, monitoring, redd counts, stream surveys, or other activities. The illegal take of listed fish should be described in the required report developed post-season by each party, as described in Term and Condition 1a above.

1e. Take measures to prevent the inadvertent illegal take of listed fish. Each co-manager shall take measures to inform fishers on subjects such as differentiating listed from non-listed fish, avoiding redds, and methods for releasing non-target fish. Actions should also be taken to identify and protect, through warning signs or other means, critical spawning areas of listed salmon.

To implement the Reasonable and Prudent Measure # 2, the BIA, through the Nez Perce Tribe and the Shoshone-Bannock Tribes shall:

2a. Monitor catch and other management measures at levels sufficient to fully describe the composition of the catch, in terms of species, hatchery- vs. natural- origin, and listed vs. unlisted status (primarily reliant upon existence and type of mark), such that daily progress of the fisheries toward guidelines and constraints can be determined and appropriate steps to modify or close fisheries in the South Fork Salmon River can be taken when necessary. Timely inseason monitoring is critical. This monitoring must take the form of fisheries personnel representing the appropriate fisheries co-manager(s) present at the time of the fishery and conducting creel surveys, exit surveys, and personal observations of the course of the fishery, including enumerating number and types of fish caught, numbers released, and other information on the fishery related to the successful moderation of impacts to listed species. Any other method of determining take (both retained and released catch), such as telephone surveys, must also be conducted as needed to provide necessary information on fishery impacts.

2b. Sample fisheries for stock composition, including the collection of coded-wire tags and biological information at levels necessary to insure a thorough post-season analysis of fishery impacts on listed species.

2c. Provided to NMFS catch reports from the inseason monitoring programs weekly or more often if necessary to allow for implementation of management actions consistent with incidental take limits and terms and conditions of this opinion.

2d. Forward to NMFS a postseason report detailing and summarizing the actual catch in the South Fork Salmon River fishery. An analysis of impacts on listed natural-origin and hatchery-origin fish should included in this report. Information on stock composition obtained through coded-wire tag recoveries, genetic stock sampling, or sampling for other biological information should also be included. This report shall be provided to Enrique Patiño, NMFS, Sustainable Fisheries Division, Seattle, Washington, by March 1, 2004.

The NMFS believes that incidental take resulting from the proposed South Fork Salmon River fishery will be no greater than described in section 8.1, above. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, the specified level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The agencies must immediately provide an explanation of the causes of the excess take, and review with the NMFS the need for possible modification of the reasonable and prudent measures.

8.0 CONSERVATION RECOMMENDATIONS

Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on ESA-listed species or critical habitat, to develop additional information, or to assist Federal agencies in complying with their obligations under section 7(a)(1) of the ESA. Actions necessary to minimize adverse effects are included in the Terms and Conditions. NMFS does not have any additional conservation recommendations associated with this action at this time.

9.0 REINITIATION OF CONSULTATION

This concludes formal consultation on the proposed South Fork Salmon River fishery in the Snake River Basin. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the biological opinion; (4) a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

NMFS finds the management constraints contained in this opinion necessary for the conservation of the affected listed species. In arriving at these management constraints, NMFS has been mindful of affected treaty rights and its Federal trust obligations. NMFS will reconsider the management constraints in this opinion that affect treaty rights in the event new information indicates such reconsideration is warranted.

10.0 MAGNUSON-STEVENS ACT ESSENTIAL FISH HABITAT CONSULTATION

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NMFS must provide conservation recommendations for any Federal or State action that would adversely affect EFH (§305(b)(4)(A));
- Federal agencies must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NMFS EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

EFH consultation with NMFS is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

10.1 Identification of Essential Fish Habitat

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

10.2 Proposed Action and Action Area

For this EFH consultation, the proposed actions and action area are as described in detail above (section 1.0 of the Opinion). The action is the issuance of an incidental take statement pursuant to section 7 of the ESA. The proposed action area is the mainstem of the South Fork Salmon River in Idaho, and is part of EFH designated for various life stages of chinook salmon. Neither coho or pink salmon are present in the action area.

10.3 Effects of the Proposed Action

Based on information submitted by the BIA, as well as NMFS' analysis in the ESA consultation above, NMFS concludes that the effects of this action on Snake River spring/summer chinook habitat are likely to be within the range of effects considered in the ESA portion of this consultation. Effects of the proposed action would be limited to interference with migratory passage of a very small proportion of the Snake River spring/summer chinook salmon return due to fishery timing and run timing.

10.4 Conclusion

Using the best scientific information available and based on its ESA consultation above, as well as the foregoing EFH sections, NMFS has determined that the proposed action is not likely to adversely affect EFH for chinook salmon.

10.5 EFH Conservation Recommendation

Because this action has been determined not likely to adversely affect EFH for Pacific salmon, no conservation recommendations have been developed, and no statutory response is required.

10.6 EFH Consultation Renewal

The action agencies must reinitiate EFH consultation if plans for these actions are substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for the EFH conservation recommendations (50 CFR § 600.920(k).

Appendix 1. Projected preseason Lower Granite Dam counts and Snake River tributary returns of spring and summer chinook in 2003.

Forecasts	Spring Chinook	Summer Chinook	Spring /Summer Chinook Total
Lower Granite Dam Total	35,084	12,694	47,778
Lower Granite Dam Hatchery	22,041	7,235	29,276
Lower Granite Dam Wild	13,043	5,459	18,502

Tributary	Marked Unlisted Hatchery	Unmarked Unlisted Hatchery	Ad-clipped Listed Hatchery	Non Ad Clipped Listed Hatchery	Wild Natural	Total Listed	Total	Footnotes
Snake River								
Oxbow Hatchery	0	--	0		0	0	0	1/
Tucannon River	--	--	488		246	734	734	2/
Clearwater River								
Clearwater Wild/Natural	--				1,599	0	1,599	3/
Red River Rack & Crooked River	491				96	0	587	4/
Powell Rack	224	74			27	0	325	5/
Dworshak Hatchery	3,732				0	0	3,732	6/
Kooskia Hatchery	957				0	0	957	7/
Subtotal Clearwater	**5,404**	**74**	**0**		**1,599**	**0**	**7,077**	
Salmon River								
Little Salmon and Rapid River	0				407	407	407	8/
Rapid River Hatchery	4,857				0	0	4,857	9/
Lower Main Salmon	0				70	70	70	10/
Middle Main Salmon	0				146	146	146	11/
* Secesh, Johnson, EFSouth Fork Salmon River					960	960	960	12/
* South Fork Salmon Mouth to Miners	0				61	61	61	13/
* South Fork Salmon Miners to Poverty	0				401	401	401	13/
* South Fork Salmon Poverty to Weir	0				260	260	260	13/
* South Fork Salmon River Weir	8,411		0	723	450	1,173	9,584	14/
Middle Fork Salmon	0				3,552	3,552	3,552	15/
Panther Creek	0				0	0	0	16/
Lemhi River	0				685	685	685	17/

*	Pahsimeroi Hatchery	875		467	0	97	564	1,439	18/
	Upper Main Salmon (Mid. To E. Fk.)					392	392	392	19/
	East Fork Salmon River					292	292	292	20/
	East Fork Rack	0				0	0	0	21/
	Yankee Fork					52	52	52	22/
	Valley Creek					127	127	127	23/
	Main Salmon East Fk. To Sawtooth					673	673	673	24/
	Sawtooth Hatchery Weir	0		424		756	1,180	1,180	25/
Grande Ronde River									
	Grande Ronde Subbasin	–		651	0	1,258	1,909	1,909	26/
	Lookingglass Hatchery	46				41	41	87	27/
Imnaha River									
	Imnaha Subbasin	–		2,066	0	1,444	0	3,510	28/
	TOTAL	**19,593**	**74**	**4,096**		**13,970**	**13,680**	**37,733**	
		Total Hatchery		23,763					

* Summer Chinook

Footnotes For Appendix 1.

1/ Oxbow Hatchery. Independent prediction by IDFG. In 2002 the number of wild/natural adults forecasted to return was based on a proportion of the number of hatchery origin adults (about 1%) In 2003 no hatchery origin adults are forecasted to return and therefore no wild/natural adults are forecasted to return.

2/ Tucannon River. Independent prediction by WDFW. These fish are Listed.

3/ Clearwater Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0864). Values from Subbasin Planning Smolt Density Model, StreamNet, 1/16/97.

4/ Red River Rack and Crooked River Rack. Independent prediction by IDFG. Does not include a forecast for number of RV and LV clipped chinook that were released as parr.

5/ Powell Rack. Independent prediction by IDFG. Does not include a forecast for the number of fish that were not fin clipped but were CWT.

6/ Dworshak Hatchery. Independent prediction by USFWS. Does not include a forecast for the number of fish that were not fin clipped but were CWT.

7/ Kooskia Hatchery. Independent prediction by USFWS. Does not include a forecast for

Footnotes For Appendix 1.

number of RV and LV clipped chinook.

8/ Little Salmon and Rapid River Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0220). Values from Subbasin Planning Smolt Density Model (Petrosky & Kiefer, 7/2/91).

9/ Rapid River Hatchery. Independent prediction by IDFG.

10/ Lower Main Salmon Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0038). Values from Subbasin Planning Smolt Density Model, StreamNet, 1/16/97.

11/ Middle Main Salmon Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0079). Values from Subbasin Planning Smolt Density Model, StreamNet, 1/16/97.

12/ Secesh R. and Johnson Cr. Wild/Natural. Proportion spring/summer smolt production above Lower Granite Dam (.0519). Values from Subbasin Planning Smolt Density Model, StreamNet (Kutchins, 4/15/03).

13/ South Fork Salmon River sections 27-29 - below weir. Average of sibling/redd estimate (IDFG) and redd/LGR estimate (Kutchins, 4/15/03).

14/ South Fork Salmon River Rack. Independent prediction by IDFG. Does not include a forecast for number of chinook that were CWT only and released as parr. Supplementation fish above weir are listed.

15/ Middle Fork Salmon Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.192). Values from Subbasin Planning Smolt Density Model (Petrosky & Kiefer, 7/2/91).

16/ Panther Creek Wild/Natural. IDFG and Shoshone-Bannock Tribes consider this run extirpated.

17/ Lemhi River Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.037). Values from Subbasin Planning Smolt Density Model (Petrosky & Kiefer, 7/2/91).

18/ Pahsimeroi Hatchery. Independent prediction by IDFG. These fish are listed.

19/ Upper Main Salmon (Middle Fork to East Fork). Proportion spring/summer smolt production above Lower Granite Dam (.0212). Values from Subbasin Planning Smolt Density Model, StreamNet (Kutchins, 4/15/03).

20/ East Fork Salmon River. Redd/LGR regression estimate (Kutchins, 4/15/03).

21/ East Fork Rack. Independent prediction by IDFG.

Footnotes For Appendix 1.

22/ Yankee Fork Salmon River. Redd/LGR regression estimate (Kutchins, 4/15/03).

23/ Valley Creek. Redd/LGR regression estimate (Kutchins, 4/15/03).

24/ Main Salmon River from the East Fork Salmon River to the Sawtooth Hatchery weir. Proportion spring/summer smolt production above Lower Granite Dam (.0364). Values from Subbasin Planning Smolt Density Model, StreamNet (Kutchins, 4/15/03).

25/ Sawtooth Hatchery. Independent prediction by IDFG. These fish are listed.

26/ Grande Ronde Subbasin. Independent prediction by ODFW. Does not include Lookinglass Creek returns. These fish are listed.

27/ Lookingglass Hatchery. Independent prediction by ODFW.

28/ Imnaha Subbasin. Independent prediction by ODFW. These fish are listed.

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