UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to NMFS No:
2005/00201

June 23, 2005

Mr. Mark Madrid, Forest Supervisor
Payette National Forest
PO Box 1026
McCall, Idaho 83638

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Emergency Consultation for the Nick Fire Retardant Drop within the West Fork Buckhorn Creek 6th Field HUC (170602080803), Valley County, Idaho

Dear Mr. Madrid:

The enclosed document contains a biological and conference opinion (Opinion) prepared by National Marine Fisheries Service (NMFS) pursuant to Section 7(a)(2) of the Endangered Species Act (ESA) on the effects of Emergency Consultation for the Nick Fire Retardant Drop within the West Fork Buckhorn Creek 6th field hydrologic unit code (170602080803). In this Opinion, NMFS concludes that the emergency action is not likely to jeopardize the continued existence of the Snake River spring/summer Chinook and Snake River steelhead evolutionarily significant units or result in the destruction or adverse modification of critical habitat designated for Snake River Chinook salmon. Further, NMFS concludes that the emergency action is not likely result in the destruction or adverse modification of critical habitat that NMFS proposed to designate for Snake River steelhead, and is not likely to jeopardize the continued existence of proposed resident *Oncorhynchus mykiss*.

This document also includes the results of our consultation on the action's likely effects on essential fish habitat (EFH) pursuant to Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act, and includes six conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects to EFH. Section 305(b)(4)(B) of the MSA requires Federal agencies to provide a detailed written response to NMFS within 30 days after receiving these recommendations. If the response is inconsistent with the recommendations, the Payette National Forest must explain why the recommendations will not be followed, including the justification for any disagreements over the effects of the action and the recommendations. In response to increased oversight of overall EFH program effectiveness by the White House Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, in your statutory reply to the EFH portion of this consultation, we ask that you clearly identify the number of conservation recommendations accepted.

If you have questions regarding this consultation or need to request confirmation of the conference as a biological opinion, please contact Debbie Artimez of my staff in the Idaho State Habitat Office at 208/378-5648.

Sincerely,

Russell M Strach for

D. Robert Lohn
Regional Administrator

cc: J. Foss - USFWS
D. Allen – IDFG
K. Kutchins – Shoshone-Bannock
R. Eichsteadt – NPT
D. Burns - PNF

Endangered Species Act – Section 7 Formal Consultation
Biological and Conference Opinion

and

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Emergency Consultation for the Nick Fire Retardant Drop within the West Fork Buckhorn Creek 6th Field HUC (170602080803), Valley County, Idaho

Lead Action Agency: USDA Forest Service, Payette National Forest

Consultation Conducted By: National Marine Fisheries Service, Northwest Region

Date Issued: June 23, 2005

Issued by: Russell M Strach for

D. Robert Lohn
Regional Administrator

NMFS No.: 2005/00201

TABLE OF CONTENTS

1. INTRODUCTION 1
1.1 Background and Consultation History 1
1.2 Emergency Actions 2
1.2.1 Nick Creek Retardant Drop 2
1.2.2 Surveys Evaluating Extent of Action 3
1.3 Action Area 3
2. ENDANGERED SPECIES ACT 4
2.1 Biological and Conference Opinion 4
2.1.1 Status of the Species and Critical Habitat 5
2.1.1.1 Status of the Species 5
2.1.1.2 Status of Critical Habitat 12
2.1.2 Environmental Baseline 13
2.1.3 Effects of the Action 17
2.1.3.1 Effects on Listed Species and Their Habitat 18
2.1.3.2 Effects on Critical Habitat 22
2.1.4 Cumulative Effects 23
2.1.5 Conclusion 24
2.1.6 Conservation Recommendations 25
2.1.7 Reinitiation of Consultation 26
2.2 Incidental Take Statement 26
2.2.1 Amount or Extent of Take 27
2.2.2 Effect of Take 28
2.2.3 Recommendations Provided to Minimize Take 28
3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT 29
3.1 Conclusion 29
3.2 EFH Conservation Recommendations 29
3.3 Statutory Response Requirement 29
3.4 Supplemental Consultation 30
4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW 30
4.1 Utility 30
4.2 Integrity 30
4.3 Objectivity 31
5 LITERATURE CITED 32

TABLES

Table 1. References for Additional Background on Listing Status, Protective Regulations, and Life History for the ESA-Listed Species Considered in this Consultation..... 6
Table 2. Interim Recovery Targets Established for ESA-listed Fish Species under NMFS Jurisdiction (NMFS 2002). 12
Table 3. Summary of Spring/summer Chinook Salmon and Steelhead Redd Counts from IDFG for the SFSR (mile 0 to mile 88.6)..... 17

APPENDIX

Appendix A Federal Register Notices for Rules 39

ACRONYMS

BA	Biological Assessment
BRT	Biological Review Team
cfs	Cubic Feet/Second
CRB	Columbia River Basin
DQA	Data Quality Act
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FA	Functioning Appropriately
FR	Functioning at Risk
FUR	Functioning at Unacceptable Risk
HUC	Hydrologic Unit Code
LC50	Lethal Concentration 50
LRMP	Land and Resource Management Plan
LSFTRP	Lower South Fork salmon Trap
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
Opinion	Biological and Conference Opinion
PCEs	Primary Constituent Elements
PNF	Payette National Forest
SFSR	South Fork Salmon River
SFSTRP	South Fork Salmon Trap
USFS	U.S. Forest Service
VSP	Viable Sustainable Population
WCIs	Watershed Condition Indicators
WF	West Fork

1. INTRODUCTION

This biological and conference opinion (Opinion) was prepared by National Marine Fisheries Service (NMFS) in accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531, *et seq*.), and implementing regulations at 50 CFR 402. Consistent with a decision rendered by the 9th Circuit Court of Appeals on August 6, 2004, in *Gifford Pinchot Task Force et al. v. U.S. Fish and Wildlife Service* (378 F.3d 1059), the regulatory definition of "destruction or adverse modification of critical habitat" at 50 CFR 402.02 was not applied to complete the following analysis with respect to critical habitat; statutory provisions of the ESA were relied on instead.

The essential fish habitat (EFH) consultation was prepared in accordance with Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 USC 1801 *et seq*.) and implementing regulations at 50 CFR 600.

The U.S. Forest Service (USFS), Payette National Forest (PNF), has requested emergency consultation for the effects of one action from the Nick Fire that occurred on August 6, 2004, which is the accidental retardant drop on Nick Creek. This action falls outside of the analysis of effects covered under the PNF's Fire Suppression Programmatic found within the ESA section 7 consultation for the South Fork Salmon River (SFSR) Watershed Ongoing and New Actions biological assessment (BA), Volume 24 (Wagoner and Burns 2001). The administrative record for this consultation is on file at NMFS's Idaho State Habitat Branch Office.

1.1 Background and Consultation History

NMFS was contacted through an e-mail on August 11, 2004, from the PNF fish biologist, Dave Burns, notifying NMFS of the accidental retardant drop. NMFS was subsequently updated on the status of the retardant drop through e-mails from the PNF on August 30 and September 1, 2004. A draft BA was received on January 5, 2005, and was discussed with the PNF Level One Team on January 19, 2005. NMFS received a complete BA and EFH assessment on the Nick Fire Retardant Drop on February 17, 2005, and consultation was initiated at that time. Emergency consultation was not initiated until the BA was submitted to NMFS on February 17, 2005.

NMFS contacted the Nez Perce Tribe and Shoshone-Bannock Tribe pursuant to the Secretarial Order (June 5, 1997) because the Nick Fire Retardant Drop has likely affected tribal trust resources. NMFS contacted both Tribes on January 27, 2005, through an e-mail informing the tribes of the consultation, providing a description of the action and a request for input on tribal trust resources. Coordination with the Nez Perce Tribe occurred through a follow up e-mail on January 31, 2005. The Nez Perce Tribe requested additional information on the effects of the drop but no additional concerns were expressed. NMFS provided the additional information to the Tribe through another e-mail that same day. On January 31, 2005, NMFS followed up with a

phone call to the Shoshone-Bannock Tribe. No contact was made, but a phone message was left. NMFS also sent out an e-mail to the Shoshone-Bannock Tribe on February 3, 2005, notifying the Tribe of the consultation and asking for input on tribal trust resources. The Shoshone-Bannock Tribe never responded to e-mails or phone calls.

1.2 Emergency Actions

As outlined in the NMFS' consultation regulations (50 CFR 402.05), emergency circumstances can mandate the need to consult in an expedited manner; conducting consultation informally through alternative procedures consistent with the requirements of sections 7(a)-(d) of the ESA. This provision applies to situations involving acts of God, disasters, casualties, national defense or security emergencies, etc. It is further required that formal consultation be initiated as soon as practicable after the emergency is under control. The Federal agency is required to submit information describing the nature of the emergency action(s), the justification for the expedited consultation, and an assessment of the impacts that occurred to ESA-listed species and/or their habitats. NMFS evaluates this information and issues an Opinion including the information and recommendations given during the emergency consultation.

Emergency actions considered in this Opinion occurred within the SFSR 4th code United States Geological Survey hydrologic unit code (HUC) #17060208. Nick Fire suppression actions occurred in and around West Fork (WF) Buckhorn (6th code HUC #170602080803) in all or portions of T18N, R5E, Sections 1, 2, and 3. The retardant drop occurred within Nick Creek and chemical effects were expected to be seen within Nick Creek and the WF Buckhorn creek. These two streams lie within the WF Buckhorn 6th field HUC which flows into the SFSR.

1.2.1 Nick Creek Retardant Drop

The Nick Fire was reported to PNF Dispatch on August 6, 2004. That afternoon PNF Air Attack requested a T22 air tanker load of retardant for the fire from PNF Dispatch. Krassel District Fire personnel were unaware of the retardant approval because PNF Dispatch and Air Attack were communicating on different frequencies. There was no coordination with PNF fish biologists on this fire suppression action.

Approximately 2,500 gallons of LCG Fire-Trol Retardant was dropped on the Nick Fire. The Nick Fire was suppressed for the next several days using helicopter buckets (dipping from Nick Lakes), hoselays, and other suppression actions analyzed in Wagoner and Burns (2001), and consistent with that BA and its Section 7 consultation (Faurot 2005). It was later determined that the fire retardant drop on the afternoon of August 6 was not consistent with the PNF's Wildland Fire Suppression programmatic (Wagoner and Burns 2001) because the retardant did not avoid

streams and the effects of that action were not analyzed within the 2001 consultation. Approximately 300 to 600 gallons of retardant were dropped into Nick Creek, a tributary to WF Buckhorn Creek at (T18N, R5E, Section 3).

1.2.2 Surveys Evaluating Extent of Action

On August 7, 2004, Krassel Fire personnel walked the area where the retardant had been dropped, and discovered that retardant had been dropped into Nick Creek. The PNF estimated that approximately 300-600 gallons of retardant had been released into Nick Creek and this was reported to the Krassel Ranger District and district fish biologist (Faurot 2005).

On August 27, Krassel fire personnel and a PNF fisheries technician surveyed the Nick Creek retardant drop area and concluded that approximately 820 feet of Nick Creek (rocks, substrate, and riparian vegetation on both sides of the stream) had signs of retardant. Live salmonids (50-150mm) were observed while walking the stream within the area affected by retardant. No dead organisms were observed during this survey.

On September 8, 2004, a fish species inventory was conducted by a PNF fisheries biologist and fisheries technician on WF Buckhorn Creek beginning at its confluence with Nick Creek. This survey concluded that 11 brook trout (*Salvelinus fontinalis*), four cutthroat trout (*Oncorhynchus clarki*), and eight redband trout/steelhead (*O. mykiss*) were observed in a 492 foot snorkel survey. However, the report also noted that differentiation between redband/steelhead and cutthroat trout was difficult and may not have been accurate (Faurot 2005).

1.3 Action Area

The Action area means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For purposes of this consultation, the action area is Nick Creek from the point of spill downstream to the its confluence with WF Buckhorn Creek, and mainstem WF Buckhorn from Nick Creek downstream to its confluence with Buckhorn Creek which is located within the WF Buckhorn (HUC 170602080803).

The action area is used by Snake River spring/summer Chinook salmon, Snake River steelhead and Snake River resident rainbow trout (*O. mykiss*). The PNF have documented Chinook salmon and steelhead in the mainstem and steelhead in WF Buckhorn Creek upstream to and beyond the confluence with Nick Creek. It is assumed that Chinook, resident *O. mykiss*, and steelhead are likely to be present within Nick Creek, since no barriers exist and the species are located directly downstream within WF Buckhorn Creek.

Designated critical habitat is present for Chinook salmon along with proposed critical habitat for steelhead. Chinook critical habitat is designated for the entire action area, whereas proposed critical habitat for steelhead only includes WF Buckhorn and Buckhorn Creeks. The action area is also designated as EFH for Chinook salmon and is in an area where environmental effects of the emergency action may adversely affect EFH for that species. Snake River resident rainbow trout (*O. mykiss*) are currently proposed for listing where genetic interbreeding with steelhead can occur (50 FR 33102). Proposed resident *O. mykiss* occur within the action area.

2. ENDANGERED SPECIES ACT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the U.S. Fish and Wildlife Service and NMFS, as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats. Section 7(b)(4) requires the provision of an incidental take statement specifying the impact of any incidental taking and specifying reasonable and prudent measures to minimize such impacts.

2.1 Biological and Conference Opinion

This Opinion presents NMFS' review of the status of each evolutionarily significant unit (ESU) considered in this consultation (Appendix A), the condition of designated critical habitat, the environmental baseline for the action area, all the effects of the emergency action as conducted, and cumulative effects (50 CFR 402.14(g)). For the jeopardy analysis, NMFS analyzes those combined factors to conclude whether the emergency action is likely to appreciably reduce the likelihood of both the survival and recovery of the affected ESA-listed species.

The critical habitat analysis determines whether the emergency action will destroy or adversely modify designated critical habitat for listed species by examining any change in the conservation value of the essential features of critical habitat. This analysis does not rely on the regulatory definition of "adverse modification or destruction" of critical habitat invalidated by the 9th Circuit Court of Appeals (*Gifford Pinchot Task Force et al. v. U.S. Fish and Wildlife Service*, 378 F.3d 1059). Instead, this analysis focuses on statutory provisions of the ESA, including those in Section 3 that define "critical habitat" and "conservation," in Section 4 that describe the designation process, and in Section 7 that set forth the substantive protections and procedural aspects of consultation.

The objective of this Opinion is to determine whether the Nick Creek Fire retardant drop is likely to jeopardize the continued existence of Snake River steelhead, resident *O. mykiss*, or

spring/summer Chinook salmon, or destroy or adversely modify designated critical habitat for Snake River spring/summer Chinook salmon and proposed critical habitat for Snake River steelhead.

2.1.1 Status of the Species and Critical Habitat

This section defines range-wide biological requirements of each ESU, and reviews the status of each ESU and each affected critical habitat relative to those requirements. The present risk faced by each ESU informs NMFS' determination of whether additional risk will "appreciably reduce" the likelihood that an ESU will survive or recover in the wild. The greater the present risk, the more likely any additional risk resulting from the emergency action's effects on the population size, productivity (growth rate), distribution, or genetic diversity of the ESU will be an appreciable reduction (McElhaney et al. 2000).

2.1.1.1 Status of the Species

NMFS reviews the range-wide status of the species affected by the emergency action using criteria that describe a "viable sustainable population" (VSP) (McElhaney et al. 2000) and lists the affected species in Table 1. Attributes associated with a VSP include the abundance, productivity, spatial structure, and diversity necessary to safeguard the genetic diversity of the listed ESU, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment. These attributes are influenced by survival, behavior, and experiences throughout the entire life cycle; characteristics that are influenced in turn by habitat and other environmental conditions.

To be considered viable with a negligible risk of extinction due to threats from demographic variation, local environmental variation, and genetic diversity changes over a 100-year time frame, an ESU should have the following characteristics. It should contain multiple populations so that a single catastrophic event is less likely to cause the ESU to become extinct and so that the ESU may function as a "metapopulation" as necessary to sustain population-level extinction/recolonization processes. Multiple populations within an ESU also increase the likelihood that a diversity of phenotypic and genotypic characteristics will be maintained, thus allowing natural evolutionary processes to operate and increase the ESU's long-term viability. Some of the ESU's populations should be relatively large and productive to further reduce the risk of extinction in response to a single catastrophic event that affects all populations. If an ESU consists of only one population, that population must be as large and productive ("resilient") as possible. Some populations in each ESU should be geographically widespread to reduce the risk that spatially-correlated environmental catastrophes will drive the ESU to extinction. Other populations in the same ESU should be geographically close to each other to increase connectivity between existing populations and encourage metapopulation function. Populations with diverse life histories and phenotypes should be maintained in each ESU to

further reduce the risk from environmental catastrophes or changes in environmental conditions that occur too rapidly for an evolutionary response. This genetic diversity allows natural evolutionary processes to operate within an ESU. Finally, evaluations of ESU status should take into account uncertainty about ESU-level processes. Scientific understanding of ESU-level spatial and temporal processes is limited such that the historical number and distribution of populations serve as a useful goal in maintaining viability of ESUs that are believed to have been historically self-sustaining.

Table 1. References for Additional Background on Listing Status, Protective Regulations, and Life History for the ESA-Listed Species Considered in this Consultation.

Species ESU	Status	Critical Habitat Designation	Protective Regulations	Life History
Chinook salmon (*O. tshawytscha*)				
Snake River Spring/summer	Threatened; April 22, 1992; 57 FR 14653	October 25, 1999, 64 FR 57399	July 10, 2000; 65 FR 42422	Matthews and Waples 1991; Healey 1991
Steelhead (*O. mykiss*)				
Snake River Basin	Threatened; August 18, 1997; 62 FR 43937	Proposed; December 14, 2004, 64 FR 74572	July 10, 2000; 65 FR 42422	Busby et al. 1996
Resident Rainbow Trout (*O. mykiss*)				
Snake River Basin	Proposed Threatened Listing; June 14, 2004; 50 FR 33102	N/A	N/A	Busby et al. 1996; June 14, 2004; 50 FR 33102

A. Snake River Spring/summer Chinook Salmon

The Snake River spring/summer Chinook salmon ESU, listed as threatened on April 22, 1992, (67 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 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.

Historically, the Snake River drainage is thought to have produced more than 1.5 million adult spring/summer Chinook salmon in some years during the late 1800s (Matthews and Waples 1991). By the 1950s the abundance of spring/summer Chinook had declined to an annual average of 125,000 adults. Adult returns counted at Lower Granite Dam reached all-time lows in the mid-1990s (< 8,000 adult returns), but numbers have begun to increase since 1997. Habitat

degradation is common in the range of this ESU. Spawning and rearing habitats have been impaired by activities such as tilling, water withdrawals, timber harvest, grazing, mining, and alteration of floodplains and riparian vegetation. Mainstem Columbia and Snake River hydroelectric developments have altered flow regimes and estuarine habitat, and disrupted migration corridors. Competition between natural indigenous stocks of spring/summer Chinook salmon and those of hatchery origin has likely increased due to an increasing proportion of naturally-reproducing fish of hatchery origin.

Adult returns (hatchery and wild) counted at Lower Granite Dam reached all-time lows in 1994 and 1995 (3,915 and 1,797 respectively), after which, a modest increase occurred through 2000. Adult returns at Lower Granite Dam dramatically increased after 2000, with 185,693 adults returning in 2001, 97,184 in 2002, 87,031 in 2003, and 86,501 in 2004. However, the large increase in 2001 was comprised of mostly hatchery fish, with only 10% of the returns from fish of natural origin. Returns of natural-origin adult spring/summer Chinook salmon at Lower Granite Dam in 2001 were 3.5 times the 1979-2002 average, and more than twice this average in 2002 (Fish Passage Center 2004).

The median population growth rate (λ) was used by McClure et al. (2000) to indicate whether listed populations are increasing ($\lambda > 1$) in numbers or decreasing ($\lambda < 1$). NMFS estimates that λ for the Snake River spring/summer Chinook ESU as a whole, from 1980-1997, ranges from 0.96, assuming no reproduction by hatchery fish in the wild, to 0.80, assuming that hatchery fish reproduce in the river at the same rate as wild fish (Tables B 2a and B 2b in McClure et al. 2000). The proportion of hatchery fish in the Snake River spring/summer Chinook population has been increasing with time; consequently, growth rates for the wild spring/summer Chinook population are overestimated unless corrected for hatchery influence. The degree of hatchery influence is unknown. NMFS estimated the risk of absolute extinction considering a 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 years is 0.40 for Snake River spring/summer Chinook (Table B 5 in McClure et al. 2000). 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 is 1.00 (Table B 6 in McClure et al. 2000).

The 2003 Biological Review Team (BRT) draft status review concludes that the ESU is likely to become endangered in the foreseeable future throughout all or a significant portion of its range, and should remain listed as a threatened species. The habitat of Snake River Spring/summer Chinook salmon is extensive and complex. This ESU occupies areas that as far as 900 miles inland and as high as 6,500 feet above sea level in elevation. The migration corridor between the spawning and rearing areas and the ocean includes about 500 miles of the mainstem Snake and Columbia Rivers where the habitat has been highly modified by diversion of stream flows for agriculture and municipal uses, the development of an extensive system of private and Federal

hydropower, flood control and irrigation storage dams, and a navigation system of channels and locks which affect both upstream and downstream migration of anadromous salmon species (BRT 2003).

Artificial propagation has a large influence within the Snake River spring/summer Chinook salmon ESU. Of the 31 historic populations, 11 now include integrated hatchery programs with conservation goals. Thirteen populations have no intentional hatchery influence. One, the Little Salmon River, is dominated by a non-ESU mitigation hatchery, five of the remaining populations have had some hatchery influence in the past but are currently being managed for natural production, and one is extirpated. Approximately 80% of the out-migrant smolts and returning adults are hatchery-origin. Recovery of the Snake River spring/summer Chinook salmon ESU will be influenced by the use of hatcheries for conservation purposes and the careful management of genetic and ecological risk of artificial propagation programs (BRT 2003).

The SFSR supports a large genetically cohesive grouping of summer-run fish, supplemented by the McCall Hatchery, which uses locally derived SFSR stock. The TRT considers the SFSR to be a major grouping, including three independent populations: (1) SFSR Mainstem population; (2) Secesh River population; and (3) East Fork South Fork Salmon population. The action area associated with the emergency retardant drop would affect the SFSR Mainstem population (TRT 2003). This population includes the SFSR mainstem, Poverty Flats, and Stolle Meadows, and extends the full length of the SFSR to contiguous minor downstream tributaries to the Little Salmon River.

Spring/summer Chinook salmon are present within the SFSR subbasin and the Buckhorn-Fitsum subwatershed. R1/R4 snorkeling inventories were conducted in the Buckhorn watershed in 1993-1994 (unpublished data on file at the Payette NF Supervisors Office, McCall, ID). Data from those inventories document Chinook salmon in the mainstem Buckhorn. Data from Streamnet (www.streamnet.org) characterizes the mainstem Buckhorn Creek reach between the SFSR and WF Buckhorn as spawning and rearing habitat for Chinook salmon, giving it a habitat quality rating of fair. Streamnet also identifies the lower 3.4 miles (47% of the 7.3 mile stream reach) as spawning and rearing habitat in WF Buckhorn Creek, and characterized this reach as fair habitat. Since no barriers exist between Nick Creek and the WF Buckhorn, NMFS assumes that Nick Creek provides potential rearing habitat for Chinook salmon.

B. Snake River steelhead and resident *O. mykiss:*

The Snake River steelhead ESU, listed as threatened on August 18, 1997, (62 FR 43937), includes all natural-origin populations of steelhead in the Snake River basin of Southeast Washington, northeast Oregon, and Idaho. Although none of the hatchery stocks in the Snake River basin are currently listed, several are included in the ESU and have been proposed for listing (June 14, 2004; 50 FR 33102). Studies have shown that genetic differences are greater among geographically separated *O. mykiss* populations of the same life-history form, than

between anadromous and resident life-history forms in the same geographical area. NMFS concluded that the available data suggest that resident rainbow trout and steelhead in the same area generally share a common gene pool (at least over evolutionary time periods), and included resident and anadromous populations in the same ESU. Native resident *O. mykiss* populations below impassible natural and manmade barriers that co-occur with anadromous populations, along with six artificial propagation brood stocks, are now considered a part of the Snake River *O. mykiss* ESU and are proposed for listing as threatened under the ESA (50 FR 33102). Due to similarities in life history and habitat preferences when in freshwater, effects to resident and anadromous *O. mykiss* are expected to be the same. Therefore, future references to resident *O. mykiss* and steelhead within this document will be to Snake River steelhead.

Natural runs of Snake River steelhead have been declining in abundance over the past few decades. Significant factors in the declining populations include but are not limited to mortality associated with the many dams along the Columbia and Snake Rivers, losses from harvest, loss of access to more than 50% of their historic range, and degradation of habitat used for spawning and rearing. Possible genetic introgression from hatchery stocks is another threat to Snake River steelhead since wild fish comprise such a small proportion of the population. Additional information on the biology, status, and habitat elements for Snake River steelhead are described in Busby et al. (1996).

Two distinct groups of steelhead (A-run and B-run) occur in the Snake River basin, based on the timing of passage over Bonneville Dam (Busby et al. 1996). Steelhead in the project area are believed to be mostly B-run steelhead. B-run steelhead pass Bonneville Dam after August 25 and their geographic distribution of B-run steelhead is restricted to particular watersheds within the Snake River basin (areas of the mainstem Clearwater, Selway, and Lochsa Rivers and the South and Middle Forks of the Salmon River). Genetic data are lacking for steelhead populations in South and Middle Forks of the Salmon River (Kiefer et al. 1992).

The Snake River steelhead ESU consists of hatchery fish, considered non-essential for recovery, and wild fish, which form the core population for recovery. Range-wide, wild Snake River steelhead are far below historical numbers, comprising less than 20% of the adult returns. Much of historic habitat is inaccessible due to Hell's Canyon and Dworshak Dams. The biological requirements of Snake River steelhead are currently not being met under the environmental baseline, as indicated by mostly downward trends in numbers of wild adults.

NMFS uses lambda (λ) to represent the long-term population growth rate. The median population growth rate, λ , indicates whether listed populations are increasing (> 1) in numbers or decreasing (< 1) (McClure et al. 2000). In order to achieve interim recovery numbers, λ must be greater than one, indicating an increasing population. NMFS estimates that the λ for the Snake River steelhead ESU as a whole, from 1980-1997, ranges from 0.91, assuming no reproduction by hatchery fish in the wild, to 0.70, assuming that hatchery fish reproduce in the river at the same rate as wild fish (Tables B-2a and B-2b in McClure et al. 2000). The proportion of hatchery fish in the Snake River steelhead population has been increasing with

time; consequently, growth rates for the wild steelhead population are overestimated unless corrected for hatchery influence. The degree of hatchery influence is unknown. NMFS estimated the risk of absolute extinction for the A- and B-runs, 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 years is 0.01 for A-run steelhead and 0.93 for B-run fish (Table B-5 in McClure et al. 2000). 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 is 1.00 for both runs (Table B-6 in McClure et al. 2000).

The 2001 to 2004 adult steelhead returns (hatchery and wild) at Lower Granite Dam represent the three highest counts on record, with 2001's 262,568 count representing the highest return in 26 years of record. Since 2001, counts have decreased to 218,718 in 2002, 180,672 in 2003, and 145,166 in 2004 (Fish Passage Center 2004). Although steelhead numbers have dramatically increased, wild steelhead have comprised only 10% to 26% of the total returns since 1994. Consequently, the large increase in fish numbers does not reflect a change in steelhead status based on historic levels. Recent increases in the population are not expected to continue, and the long-term trend for this species indicates a decline.

Survival of downstream migrants in 2001 was the lowest since 1993. Low survival was due to record low water run-off, and elimination of spills from the Snake River dams to meet hydropower demands (Fish Passage Center 2001). Average downstream travel times for steelhead nearly doubled and were among the highest observed since recording began in 1996. Consequently, wide fluctuations in population numbers are expected over the next few years when adults from recent cohorts return to spawning areas. Detailed information on the current range-wide status of Snake River steelhead, under the environmental baseline, is described in the steelhead status review (Busby et al. 1996), status review update (BRT 1997), and the draft Clearwater Subbasin Summary (CBFWA 2001).

The population growth rate, lambda (λ), was used by McClure et al. (2003) and Cooney (2003) to determine whether the Snake River steelhead ESU is increasing in numbers ($\lambda > 1$) or decreasing ($\lambda < 1$). Lambda, when measured over multiple generations, is a key component of population viability analysis because values less than one signal that a species is heading toward extinction. In a review of documented extinctions that have occurred in recent centuries, Caughley (1994) concluded that most species extinctions are ultimately the result of persistent declines in population growth (indicated by $\lambda < 1$), which can be reversed only if the underlying causes of the declines are identified and treated. The cause of persistent population declines is attributed by Caughley (1994) to four mechanisms identified by Diamond (1984; 1989): (1) harvest; (2) habitat destruction and fragmentation; (3) introduced species; and (4) chains of extinction among interdependent species. Harvest, habitat destruction and fragmentation, and introduced species are all known to be significant factors affecting Snake River steelhead population size.

The most recent spike in the population size of adult natural-origin steelhead occurred in 2001. It is too soon to determine whether the recent population increase is merely a short spike, or an increase in the mean population size, and the results should be treated with caution. The large returns in recent years are possibly a result of favorable climatic conditions caused by cyclic climate patterns described by Marmorek and Peters (1998), and Mantua et al. (1997), and the changes may also reflect a variety of conservation and restoration efforts that have been undertaken in the past decade. Regardless of the cause of population size fluctuations, large fluctuations in population size expose a species to an increased extinction risk (Vucetich et al.1999). A review of published literature on extinctions by Laurance (1991) indicates that populations with high amplitude spikes and dips in population size are more likely to decline below some critical threshold from which return to former numbers becomes unlikely. Snake River steelhead have exhibited extreme variation in population size in recent decades and they will continue to face a high risk of extinction until the mean population size of the ESU increases to the point where dips are unlikely to drive the population size below a critical threshold.

The TRT team divided up the Salmon River into separate Snake River steelhead populations. This action area associated with the emergency retardant drop would affect the SFSR population. This B-run population was defined on the basis of geographic and genetic characteristics. The population includes the SFSR and all its tributaries except the Secesh River. These areas are geographically separated from other spawning aggregates except the Secech. Genetic samples from the SFSR are distinct from those in the Secesh (TRT 2003).

The SFSR is designated a Priority Watershed on Federal lands (NMFS 1995). Priority watersheds are intended to protect important habitats and population strongholds of anadromous fish and are managed to maintain or improve fish habitat. The SFSR is also designated a Special Emphasis subbasin as it has a genetically and ecologically unique population of steelhead. The SFSR watershed is one of only three drainages in Idaho supporting populations of wild native steelhead (IDFG 1996).

Steelhead are present within the SFSR subbasin and Buckhorn-Fitsum subwatershed. Forest Service Region 1/Region 4 snorkeling inventories were conducted in the Buckhorn watershed in 1993-1994 (unpublished data on file at the Payette NF Supervisors Office, McCall, ID). Data from those inventories document steelhead in mainstem Buckhorn Creek and in WF Buckhorn Creek from the mouth upstream to the confluence with Nick Creek (Faurot 2005). Data from Streamnet (www.streamnet.org) characterizes the mainstem Buckhorn Creek reach between the SFSR and WF Buckhorn as spawning and rearing habitat for steelhead, as it also does with WF Buckhorn Creek. Habitat quality is rated as good for both rearing and spawning. Since no barriers exist between Nick Creek and WF Buckhorn, NMFS assumes that Nick Creek at least provides rearing habitat for steelhead.

Interim Recovery Targets for the ESUs:

To provide perspective on the potential for density dependent influences, recent geometric mean spawner abundance estimates are contrasted with interim delisting levels provided by NMFS regional office (http://www.nwr.noaa.gov/occd/InterimTargets.html). Below is a table containing estimated interim recovery target numbers for Snake River Chinook salmon and steelhead (Table 2).

Table 2. Interim Recovery Targets Established for ESA-listed Fish Species under NMFS Jurisdiction (NMFS 2002).

ESU/Spawning Aggregation	ESU Interim Recovery Target	SFSR Interim Recovery Target
Snake River Spring/summer Chinook Salmon	41,900	9,200
Snake River Steelhead	53,700	4,000

2.1.1.2 Status of Critical Habitat

NMFS reviews the status of critical habitat affected by the emergency action by examining the condition and trends of primary constituent elements (PCEs) throughout the designated area, a region that corresponds approximately to the geographic range of the species. Within the action area, critical habitat has been designated for Snake River spring/summer Chinook salmon and proposed for designation for Snake River steelhead.

The PCEs consist of the physical and biological elements identified as essential to the conservation of the species in listing and recovery documents. The ESUs addressed in this Opinion share many of the same rivers and estuaries and have similar life history characteristics and, therefore, many of the same PCEs. These PCEs include sites essential to support one or more life stages of the ESU (sites for spawning, rearing, migration and foraging). They also contain physical or biological features essential to the conservation of the ESU such as spawning gravels, water quality and quantity, side channels, and forage species.

NMFS identified six specific types of sites and their associated features: (1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development; (2) Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks; (3) Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival;

(4) Estuarine areas free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks/boulders, and side channels; and juvenile and adult forage, including aquatic quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; (5) Nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks/ boulders, and side channels; and (6) Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

The specific critical habitat and/or critical habitat units that were affected by the emergency action and that affected PCE trends within those units relate to decreases in water quality resulting from chemical contamination from the fire retardant drop that directly hit Nick Creek and flowed into WF Buckhorn Creek.

2.1.2 Environmental Baseline

The "environmental baseline" includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early Section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02). For projects that are ongoing actions, the effects of future actions over which the Federal agency has discretionary involvement or control will be analyzed as "effects of the action."

NMFS describes the environmental baseline in terms of the biological requirements for habitat features and processes necessary to support life stages of the subject ESUs within the action area. When the environmental baseline departs from those biological requirements, the adverse effects of a proposed action on the ESU or its habitat are more likely to jeopardize the listed species or result in destruction or adverse modification of critical habitat (NMFS 1999).

The biological requirements of salmon and steelhead in the action area vary depending on the life history stage present and the natural range of variation present within that system (Groot and Margolis 1991, NRC 1996, Spence et al. 1996). During spawning migrations, adult salmon generally require clean water with cool temperatures and access to thermal refugia, dissolved oxygen near 100% saturation, low turbidity, adequate flows and depths to allow passage over barriers to reach spawning sites, and sufficient holding and resting sites. Anadromous fish select spawning areas based on species-specific requirements of flow, water quality, substrate size, and groundwater upwelling. Embryo survival and fry emergence depend on substrate conditions (e.g., gravel size, porosity, permeability, and oxygen concentrations), substrate stability during high flows, and cold water temperatures (i.e., 55.4°F or less for most species). Habitat

requirements for juvenile rearing include seasonally suitable microhabitats for holding, feeding, and resting. Migration of juveniles to rearing areas, whether the ocean, lakes, or other stream reaches, requires unobstructed access to these habitats. Physical, chemical, and thermal conditions may all impede migrations of adult or juvenile fish. The biological requirement likely to be affected by this action is water quality.

The ESUs considered in this Opinion spawn, rear, and migrate through the action area. Thus, for this action area, the biological requirements for salmon and steelhead are the habitat characteristics that would support successful rearing, spawning, and migration for both species.

In general, the environment for listed species in the Columbia River Basin (CRB), including those that migrate past or spawn upstream from the action area, has been dramatically affected by the development and operation of the Federal Columbia River Power System. Storage dams have eliminated mainstem spawning and rearing habitat and have altered the natural flow regime of the Snake and Columbia Rivers by decreasing spring and summer flows, increasing fall and winter flow, and altering natural thermal patterns. Power operations cause fluctuation in flow levels and river elevations, affecting fish movement through reservoirs, disturbing riparian areas and possibly stranding fish in shallow areas as flows recede. The eight dams in the migration corridor of the Snake and Columbia Rivers kill or injure a portion of the smolts passing through the area. The low velocity movement of water through the reservoirs behind the dams slows the smolts' journey to the ocean and enhances the survival of predatory fish (Independent Scientific Group 1996, National Research Council 1996). The reservoirs slow flows contribute to higher water temperatures and provide habitat for native and introduced predatory fish. The reservoirs and navigation channel maintenance have created artificial islands that have generated huge increases in abundance of colony-nesting piscivorous birds that consume millions of downstream migrant juvenile salmon. Normal riparian vegetation, seasonally flooded wetlands and estuary marshes have been eliminated by reservoirs, rip-rapped highway and railway grades and flood-control levees. The result of the modified migration route is delayed migration, direct and indirect mortalities, larger predator populations and higher susceptibility to predation. The modified migration corridor includes lower flows and lethally high temperatures that reduce productivity of all populations, reduce diversity by selecting against some life history strategies, diminish spatial distribution by inundating and blocking some habitats, and reduce abundance through direct and indirect mortality. Additional information for these ESUs by the BRT (2003) can be found at http://www.nwr.noaa.gov/AlseaResponse/20040528/brtusr.html.

Formerly complex mainstem habitats in the Columbia, Snake, and Willamette Rivers have been reduced, for the most part, to single channels, with floodplains reduced in size, and off-channel habitats eliminated or disconnected from the main channel (Sedell and Froggatt 1984; Independent Scientific Group 1996; and Coutant 1999). The amount of large woody debris in these rivers has declined, reducing habitat complexity and altering the rivers' food webs (Maser and Sedell 1994).

Other human activities that have degraded aquatic habitats or affected native fish populations in the CRB include stream channelization, elimination of wetlands, construction of flood control dams and levees, construction of roads (many with impassable culverts), timber harvest, splash dams, mining, water withdrawals, unscreened water diversions, agriculture, livestock grazing, urbanization, outdoor recreation, fire exclusion/suppression, artificial fish propagation, fish harvest, and introduction of non-native species (Henjum et al. 1994; Rhodes et al. 1994; National Research Council 1996; Spence et al. 1996; and Lee et al. 1997). In many watersheds, land management and development activities have: (1) reduced connectivity (i.e., the flow of energy, organisms, and materials) between streams, riparian areas, floodplains, and uplands; (2) elevated fine sediment yields, degrading spawning and rearing habitat; (3) reduced large woody material that traps sediment, stabilizes streambanks, and helps form pools; (4) reduced vegetative canopy that minimizes solar heating of streams; (5) caused streams to become straighter, wider, and shallower, thereby reducing rearing habitat and increasing water temperature fluctuations; (6) altered peak flow volume and timing, leading to channel changes and potentially altering fish migration behavior; and (7) altered floodplain function, water tables and base flows (Henjum et al. 1994; McIntosh et al. 1994; Rhodes et al. 1994; Wissmar et al. 1994; National Research Council 1996; Spence et al. 1996; and Lee et al. 1997).

Environmental baseline information for the Upper SFSR can be found in Wagoner and Burns (2001), updated by Faurot and Burns (2001and 2004). The effects of the Nick Fire, fire suppression, and the accidental retardant drop will become part of the environmental baseline, which will be updated in future BAs for actions in this area. In general, the overall condition of the SFSR Section 7 watershed is improving due to the watershed rehabilitation actions implemented since the 1980's (Wagoner and Burns 2001).

The SFSR from the mouth to the headwaters is listed in DEQ's, 1998 303(d) list (State of Idaho 1999). Water bodies on this list are water quality limited and require Total Maximum Daily Loads according to section 303(d) of the Clean Water Act. In the SFSR, the pollutant identified is sediment.

The status of current projects with outstanding mitigation actions within the SFSR watershed are displayed in Table 1 within the Nick Fire Retardant Drop BA (Faurot 2005). The WF Buckhorn drainage consists of one 6th level HUC, covers about 14,531 acres, and enters the mainstem Buckhorn Creek about 0.5 mile upstream of its confluence with the SFSR. Tributaries to WF Buckhorn Creek include Nick Creek. The approximate discharge during late August 2004 of Nick Creek was 1.4 cubic feet/second (cfs), and of WF Buckhorn Creek at the Nick Creek confluence was 2.1 cfs (Faurot 2005). The WF Buckhorn drainage is unroaded and accessed by a trail system. Closed roads in the Buckhorn drainage could continue to be a source of existing and potential anthropogenic sediment to Buckhorn Creek. Since the WF Buckhorn drainage is unroaded, riparian conservation areas are relatively intact (> 80%) (Faurot 2005).

A large-scale road-to-trail project was implemented in the Buckhorn drainage in 1999-2000. Plantings, erosion control, and slope stabilization associated with the project are ongoing as

needed (Tom Crawford, PNF Watershed Rehabilitation Specialist, McCall, Idaho, personal communication). The extensive trail system in the Buckhorn drainage has not been surveyed for evaluation of potential effects of trails and trail use on fish habitat.

Habitat conditions were evaluated for the WF Buckhorn 6th level HUC analysis area using the procedures and matrices developed by the PNF land and resource management plan (LRMP) for documenting reference conditions with watershed condition indicators (WCIs) (LRMP 2003). Data references, functionality ratings (Functioning Appropriately (FA), Functioning at Risk (FR), and Functioning at Unacceptable Risk (FUR)), and supporting rationale for all of the WCIs are documented in the BA (Faurot 2005). Habitat conditions in the WF Buckhorn watershed are generally FA, with stream temperatures FR, and the substrate embeddedness and width to depth ratio WCIs FUR. Further discussion of this analysis can be found in supporting documents of the Nick Fire BA (Faurot 2005).

Chinook salmon and steelhead have been found throughout the SFSR subbasin. During the 1950's, the SFSR, including all of its tributaries was the largest producer of wild summer Chinook salmon in the CRB. Numbers of spawning salmon have declined precipitously since the construction of the Lower Snake River dams in the 1960's and 70's. The SFSR is one of three drainages in Idaho that supports wild native steelhead (LRMP 2003). Historically the SFSR produced 60% to 70% of the annual adult summer Chinook salmon return to Idaho. Historical data of steelhead production within the SFSR is unknown. The natural smolt carrying capacity within the SFSR was estimated as being 1,399,175 summer Chinook and 365,825 steelhead using the Northwest Power Planning Councils standard density model (IDFG 1990).

Russ Thurow of the U.S. Forest Service, Rocky Mountain Research Station, conducted snorkel surveys in the WF Buckhorn Creek in 1985, and came up with mean values of 0.8/100 square feet for steelhead parr (age 1 and older), and 0.7/100 square feet for Chinook salmon (age zero) (personal communication via e-mail). These values have also been applied to Nick Creek due to the close proximity to the WF Buckhorn Creek, the likelihood that fish densities will be similar within the two streams, and that these estimates are the best available data. These mean values give an estimate of 2,606 Chinook salmon and 2978 steelhead parr within the 2 miles of Nick Creek and 3 miles of the WF Buckhorn Creek affected from the retardant drop.

Redd counts for steelhead and natural spring/summer Chinook salmon were conducted by the IDFG for the SFSR. The average of these redd counts was compiled into decades and summarized in Table 3. The table shows that redd counts for spring/summer Chinook salmon have decreased since the 1950's which may be an indication of decreased fish resulting from the establishment of the Snake River dams. Unfortunately redd counts for steelhead are not as abundant as spring/summer Chinook salmon. This most likely is due to the higher stream flows, when steelhead spawn which makes it difficult to count redds.

Table 3. Summary of Spring/summer Chinook Salmon and Steelhead Redd Counts from IDFG for the SFSR (mile 0 to mile 88.6)

Decade	Spring/summer Chinook Salmon Redds	Steelhead Redds
1950's	1101	N/A
1960's	1081	N/A
1970's	339	N/A
1980's	300	N/A
1990's	431	99
2000's	690	N/A
Overall average	**657**	**99**

Data taken for this table from http://www.streamnet.org.

2.1.3 Effects of the Action

The "effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). If the emergency action includes offsite measures to reduce or offset net adverse impacts by improving habitat conditions and survival, NMFS will evaluate the net combined effects of the emergency action and the offsite measures as interrelated actions.

The "interrelated actions" are those that are part of a larger action and depend on the larger action for their justification; "interdependent actions" are those that have no independent utility apart from the action under consideration (50 CFR 402.02). Future Federal actions that are not a direct effect of the action under consideration, included in the environmental baseline, or treated as indirect effects are not considered in this Opinion.

The "indirect effects" are those that are caused by the emergency action and are later in time, but still are reasonably certain to occur (50 CFR 402.02). Indirect effects may occur outside the area directly affected by the action, and may include other Federal actions that have not undergone Section 7 consultation but will result from the action under consideration.

The Federal action reviewed under this emergency consultation is a retardant drop that occurred over Nick Creek. This action was part of the fire suppression activities to control the Nick Fire and falls outside of the PNF's programmatic consultation on Wildland Fire Suppression because the effects of this action were not previously analyzed (Wagoner and Burns 2001). This retardant drop of LCG Fire-Trol over Nick Creek occurred on August 6, 2004 and put approximately 300-600 gallons into the creek (Faurot 2005).

2.1.3.1 Effects on Listed Species and Their Habitat

Direct effects from this action are related primarily to chemical contamination of the water resulting in direct mortality and sublethal effects to fish within and downstream of the retardant drop area. Chemical contamination of water quality would disrupt behavior and/or kill rearing juveniles and adult fish as far downstream as 5 miles from the retardant drop area. Juvenile steelhead and Chinook salmon were likely within Nick Creek and within the total 5 miles affected by the retardant drop. Adult steelhead were not likely within the 5 miles effected from this retardant drop due to the timing of the incident. In early August, it is likely that adult Chinook salmon were either moving into or holding in Buckhorn and WF Buckhorn, and potentially spawning. Along with the direct effects to salmon and steelhead, the prey base for these fish would also be affected by the degraded water quality resulting in a likely decrease of invertebrate diversity and abundance.

Fire-Trol LCG retardant is composed primarily of liquid ammonium polyphosphate and is based on commercial fertilizers (MSDS 1999). The designation –R after Fire Trol LCG-R means that the product contains a red iron oxide dye (Calfee and Little 2003b). Fire-Trol LCG is considered to be a long-term retardant. Long-term retardants contain: fire retardant salts (alone or in combination), ammonium sulfate, diammonium phosphate, monoammonium phosphate, ammonium polyphosphate, preservative or spoilage inhibitor (found only in gum-thickened retardants), corrosion inhibitor(s), coloring agent, thickening agent, and guar gum or clay components (http://www.firetrolholdings.com/faqs.htm#2). The hazardous decomposition products within Fire-Trol LCG retardant include ammonia and sodium cyanide (a corrosion inhibitor). Studies have shown that a retardant drop directly into a stream may cause sufficient ammonia concentration in the water to be lethal to fish and other aquatic organisms (MSDS 1999). Aquatic toxicity of Fire-Trol LCG for rainbow trout is a Lethal Concentration 50 (LC50) value at 96 hours (i.e. the concentration of a chemical which kills 50% of a sample population in a 96-hour period) of 790 mg/liter (USFS 2004). The LC50 value for Chinook salmon at 96 hours is 874 mg/liter (Buhl and Hamilton 1998).

Ingredients within Fire-Trol LCG that could cause lethal and sublethal effects to stream biota and listed fish species are ammonia and sodium cyanide. Norris and Webb conducted studies on ammonium-based fire retardants and their effects on water quality. The principal chemicals found within the first 24 hours after application to a stream were ammonia, nitrogen, and phosphorus. Unionized ammonia is important due to its potential toxic effects on aquatic species, although effects from these chemicals are dependent upon the pH of the water. As the pH increases, the proportion of ammonia nitrogen present increases. Acutely toxic concentrations of ammonia reported for Pacific salmon range from 0.08 to 1.1 mg/L (Russo 1985). Phosphorous effects could cause downstream eutrophication resulting in the lowering of the water's available oxygen for aquatic species. After 24 hours, nitrate and soluble organic nitrogen are the primary retardant chemicals left in the stream (Norris and Webb 1989, USDA 1983).

One study by the Yankon Field Research Station of the USGS showed that the toxicity of fire retardants (Fire-Trol GTS-R, Fire-Trol LCG-R, and Phos-Check D75-F) were due to the unionized ammonia derived from ammonium salts, noting effects on *Daphnia magna*, postembryonic life stages of Chinook salmon, fathead minnow (*Pimephales promelas*), and rainbow trout (*O. mykiss*) (http://www.cerc.usgs.gov/FRS_Webs/Yankton/fire.htm). Within the study of Buhl and Hamilton, all rainbow trout mortality that was associated with fire retardants (Fire-Trol LCA-F, Fire-Trol LCM-R, and Phos-Check 259F) occurred within a 24 hour period for ammonia. This study was conducted under flow-through conditions at a pH range of 7.86-8.22 (Buhl and Hamilton 2000).

Sensitivity of rainbow trout was ranked from most sensitive to least sensitive for selected long-term fire retardants and foam retardants. These sensitivities are as follows: swim up fry, 90 days post-hatch juveniles, 60 days post-hatch juveniles, embryo larvae, and eyed egg (Gaikowski, M.P.; et. al 1996). Fire Trol-LCG-R was one of the selected long-term retardants in this experiment. Results from Gaikowski, Hamilton, and Buhl's experiment of testing Fire-Trol LCG-R on early life stages of rainbow trout suggest that swim up fry, 90 days post-hatch juveniles, and 60 days post-hatch juveniles were the most likely affected life forms from the toxicity of unionized ammonia derived from the ammonium polyphosphate component of the retardant (Gaikowski, M.P.; et. al 1996). It can be assumed from the study by the Yankon Field Research Station of the USGS and the results from Gaikowski, Hamilton, and Buhl's experiment that effects to Chinook salmon swim up fry, 90 days post-hatch juveniles, 60 days post-hatch juveniles, embryo larvae, and eyed egg would be the similar for the sensitivity to rainbow trout.

An accidental drop of Fire-Trol LCG-R would have to be diluted to at least 297- to 310- fold to reach a concentration equal to the 96 hour LC50 (Gaikowski, M.P.; et. al 1996). Even though fire retardants can have a relatively low order of acute toxicity to fish (96-h LC50s >100 mg/L), exposure concentrations in streams may approach or exceed toxic concentrations for a short period immediately following a direct application to a stream (Buhl and Hamilton 1998). Fish mortality could occur as far as 6.2 miles below the drop site, depending on application patterns and characteristics of the stream (Norris and Webb 1989).

Sodium ferrocyanide deposited into streams through the use of fire retardants will produce some cyanide through photolysis (USDA 1983). Recent laboratory studies have shown that fire-retardants containing sodium ferrocyanide have increased toxicity when exposed to ultraviolet radiation or sunlight. This photo-enhanced toxicity is caused by free cyanide released from the photo-activation of sodium ferrocyanide (Calfee and Little 2003a and 2003b). The concentration of cyanide is dependent upon the amount of the ferrocyanide deposited into the stream, the light intensity after deposition, and the volume of the stream. Cyanide generally does not pose a long-term hazard to fish or fish habitat because of the volatility losses and dilution factors (USDA 1983). Streamflow characteristics influence the length of the mortality zone by determining the degree and speed of mixing and dilution of retardant with downstream travel. Adverse effects on fish due to chronic cyanide exposure include susceptibility to predation,

disrupted respiration, osmoregulatory disturbances, and altered growth patterns (Eisler et. al 1999). It can be assumed after reviewing the available data available, that free cyanide concentrations in the range from 50 to 200 µg/1 are fatal to most fish species (USEPA 1980).

Indirect effects from the chemicals of the retardant are anticipated to include a reduced food base for juvenile fish from mortality of macroinvertebrates and temporary degradation (up to 3 days) of habitat quality from the chemical contamination from the retardant directly within and downstream of the drop area. NMFS anticipates that macroinvertebrate densities will be decreased for a period of up to a year, with full community recovery lasting up to several years (Lytle and Peckarsky 2001). Eutrophication of downstream reaches could occur due to increased phosphates (Spence, et. al. 1996).

Leaching studies have shown that the use of fire retardants on sites adjacent to streams can result in entry of nitrogen into the stream in measurable quantities and in a form toxic to fish. However, the probability of occurrence of toxic levels from surface runoff is expected to be low (USDA 1983). Rain runoff following the application of Fire-Trol GTS-R could result in lethal concentrations in small ponds and in streams receiving limited flow, whereas larger aquatic systems would likely dilute the formulations to sublethal levels. However, these sublethal levels could have lethal effects at source points (Calfee and Little 2003a). Fire-Trol GTS-R could persist in the environment under ambient summer conditions for at least 45 days, and possibly longer (Calfee and Little 2003a). The duration of chronic effects resulting from leaching of Fire-Trol chemicals from soil and/or vegetation from riparian areas that were hit from the accidental drop are dependent upon rainfall and weather conditions. Dry weather periods could prolong the effects of these chemicals in the environment. The long-term fire retardants are effectively fertilizers, composed of ammonium phosphate and ammonium sulphate salts, which are mixed with water to ensure uniform dispersal. After the water evaporates, they remain effective until rain and erosion disperses them (Adams and Simmons 1999).

A Fire-Trol chemist (Rob Crouch, Chemist, Fire-Trol Holdings LLC, Phoenix, AZ, personal communications with the BA author) was consulted to determine if fish and macroinvertebrates in Nick Creek could have been killed by the retardant drop and how far downstream the concentration was likely to have lethal or sublethal effects to fish and macroinvertebrates. The chemist was provided with stream dimensions in the drop area and the approximate volume of retardant that hit Nick Creek (300-600 gallons). The chemist was certain that fish and macroinvertebrates were killed in the immediate vicinity of the retardant drop due only to the ammonium compound. He estimated that fish and macroinvertebrates may have been killed or sublethally affected by the ammonium compound a mile or two downstream of the lowest drop point, but not 4 to 5 miles downstream (due to the ammonium compound) since ammonia dissipates rapidly in moving water and with dilution by incoming tributaries.

The BA author also consulted Ed Little of the US Geological Survey, Columbia Environmental Research Center, an author of a recent report analyzing the environmental implications of LCG. Mr. Little indicated that fish and macroinvertebrates were likely killed at the site of the retardant

drop and some distance downstream. Mr. Little estimated that fish and macroinvertebrates would probably be affected lethally for approximately 2 miles downstream of the drop zone (i.e., to the confluence of Nick Creek and WF Buckhorn Creek), with additional potential for lethal and sublethal effects for up to 4-5 miles downstream (i.e., to the mouth of WF Buckhorn Creek).

Based on the effects described above, it is reasonably certain that the emergency action will have localized (up to 5 miles from the retardant drop area), short-term (up to a maximum of 3 years for full macroinvertebrate community richness and direct take of species for up to several days after the retardant drop) effects to listed species and their habitat. Based on the information reported above, NMFS assumes that all juvenile Chinook salmon and steelhead were killed within the 2 miles of Nick Creek from where the retardant drop occurred to where Nick Creek meets the WF Buckhorn Creek. NMFS also assumes that macroinvertebrates within those 2 miles were also killed along with degradation of water quality from ammonia and sodium ferrocyanide. Water quality is assumed to have been degraded from these chemical contaminants for 1-3 days. After three days it is estimated that sufficient dilution will have occurred to where remnant chemicals were not of sufficient concentration to be lethal to fish. This assumption is based on the premise that there are no large quantities of retardant acting as source points on the streambanks of Nick Creek. A review of photos provided with the BA suggests that Nick Creek is covered with adequate vegetation to help buffer residual retardant that did not enter the stream.

NMFS assumes that sublethal and possibly lethal effects could have occurred as far downstream as 3 miles within the WF Buckhorn Creek (total 5 miles from the retardant drop zone). Adult Chinook salmon could have been within those 3 miles either preparing to spawn or spawning. Streamnet summarized the WF Buckhorn as a fair habitat rating for Chinook salmon with a utilization of 48% of the stream reach (http://www.streamnet.org). NMFS assumes that no adult Chinook salmon were killed from the retardant drop since habitat is considered to be fair, retardant concentration was likely diluted enough for adults to move out and avoid areas where retardant drop effects could be felt, and that adults are likely near the confluence of the WF Buckhorn and SFSR, close to 5 miles downstream from the drop zone. NMFS assumes by using the best available data that approximately 2,606 Chinook salmon and 2978 steelhead parr were within the 2 miles of Nick Creek and 3 miles of the WF Buckhorn Creek (reference 2.1.2 Environmental Baseline within this document). It is likely that not all of these parr were lethally killed. Since NMFS can not determine the exact point were dilution of the Fire-Trol LCG-R was no longer considered to be lethal, NMFS is assuming a worst case scenario that all parr experienced either sublethal or lethal effects.

Estimating take of fish caused by the action includes estimates of the number of exposed juveniles harmed along with their equivalent in adult returns. The take of juveniles was estimated using methods and assumptions already outlined above. To convert juveniles into adult equivalents for calibrating take estimates at the population scale, we obtained juvenile and

adult PIT-tagging and detection details from the PIT-Tag Information System (http://www.psmfc.org/pittag) for summer Chinook salmon and steelhead tagged at the upper and lower traps (South Fork Salmon Trap (SFSTRP) and Lower South Fork salmon Trap (LSFTRP)). Only juveniles tagged at the SFSTRP were used for Chinook conversions.

The numbers of juveniles tagged were then regressed with the numbers of tagged adult returns from each year class to investigate relations between the number of adult returns expected from tagged juveniles (Chinook brood years 1995-2000 and steelhead brood years 1995-2000). The basic assumption was made that combined (average) survival of subyearling, yearling, and two-year old (steelhead only) migrants to adulthood were similar to survival of the congregation of stream-residing parr exposed to the action.

Strong relationships between the number of tagged juveniles and the subsequent number of adult Chinook salmon returns from the SFSR were found, although the time series was short (6 years) with relatively few adult returns (50 total). Still, the number of out-migrating juvenile Chinook in each year class were a good predictor of adult returns ($P = 0.0127$, $r^2 = 0.91$, $n = 6$, $y = 0.0057x - 8.7551$). However, there were no adult returns from the first 4 years of tagging (7,326 juveniles), which biased the conversion ratio, so the number of tagged adult returns per number of tagged juveniles in all years and in total from years with adult returns were calculated to frame the conversion. Using this method, a grand total of 25,288 juvenile Chinook were tagged since brood-year 1992 with 50 adult returns for a low-range equivalency of 0.002 adults per juvenile and, since brood-year 1995, 17,962 tagged juvenile Chinook returned 50 adults for an equivalency of 0.0028 juveniles per adult at the high-range.

Since 1993, seven adult steelhead returned from 3,628 tagged juvenile steelhead migrants. There were no adult returns from first 6 years of tagging juvenile steelhead (2,152 tags), which was too limited for bivariate analysis. Again we converted the grand total number of juvenile steelhead tagged per adult return to find a low-range equivalency of 0.0019, and the total number of juveniles tagged (1,476) in years with adult returns to find a high-range equivalency of 0.0047 juveniles per adult.

Thus, SFSR Chinook salmon and steelhead juveniles convert to adults at between 0.002-0.0028 and 0.0019-0.0047, respectively. Stated another way one adult return is expected from every 360-505 juvenile Chinook salmon and about 215-530 juvenile steelhead. Using these numbers compared with the estimated juveniles within Nick Creek and the WF Buckhorn Creek, NMFS assumes that 6-14 adult steelhead and 6-8 adult Chinook salmon were lost from the retardant drop.

2.1.3.2 Effects on Critical Habitat

The action likely had direct and indirect effects on designated and proposed critical habitat. Direct effects included degradation of water quality from the chemical contamination of the

Fire-Trol LCG-R directly into Nick creek extending as far down as into WF Buckhorn Creek. Water quality was degraded from sodium ferrocyanide and ammonia within the drop area and directly downstream for up to an estimated maximum of three days. Eutrophication of downstream reaches could occur due to increased phosphates (Spence, et. al. 1996). Chronic effects could result from riparian vegetation and soils that are contaminated from sodium ferrocyanide and other retardant chemicals that can wash into the aquatic environment for an extended period of time (estimated up to a year). Low organic soils can increase chemical persistence. The soils identified within the Nick Creek/Buckhorn drainage contain these low organic soils (Faurot 2005; Little and Calfee 2002, and Little and Calfee 2000, found at http://www.cerc.cr.usgs.gov/pubs/pubs.htm#fire). These effects will affect designated and proposed critical habitat for juvenile and adult spring/summer Chinook salmon and steelhead. Rain runoff following the application of Fire-Trol LCG-R could result in lethal concentrations in small ponds and in streams receiving limited flow, whereas larger aquatic systems would likely dilute the formulations to sublethal levels. Fire-Trol LCG-R just like Fire-Trol GTS-R, could persist in the environment under ambient summer conditions for at least 45 days, and possibly longer. The duration of chronic effects resulting from leaching of Fire-Trol chemicals from soil and/or vegetation from riparian areas within Nick Creek that were hit from the accidental drop are dependent upon rainfall and weather conditions. Dry weather periods could prolong the effects of these chemicals in the environment. NMFS expects that these effects from leaching of nitrates and sodium ferrocyanide are expected to last no longer then one full year. Rain and snow is expected to wash away and dilute remaining components of the Fire-Trol LCG-R.

An incremental change in the conservation value of critical habitat within the action area due to the emergency action cannot be quantified. However, based on the effects described above, it is reasonably certain that the emergency action will have a localized (up to 5 miles from the retardant drop area), short-term (up to 1 year), negative reduction in the conservation value of the critical habitat affected.

2.1.4 Cumulative Effects

The "cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Cumulative effects that reduce the capacity of listed ESUs to meet their biological requirements in the action area increase the risk to the ESU that the effects of the proposed action on the ESU or its habitat will result in jeopardy (NMFS 1999).

The following paragraph is excerpted from the SFSR Management Area section of the Forest Service 2003 LRMP. The SFSR watershed includes the Buckhorn-Fitsum 5th field HUC. This watershed attracts a variety of dispersed recreation such as hunting, fishing, hiking, ATV use, motorcycling, mountain biking, sightseeing, whitewater boating, and camping (LRMP 2003). In years of surplus hatchery Chinook salmon returns, a sport-fishing season is permitted. A network of trails provides access to portions of the roadless area, offering a variety of motorized

and non-motorized opportunities. Public use of the SFSR along with the Buckhorn-Fitsum drainage is expected to increase due to the popularity of these outdoor activities and the increase of populations of near by communities along with the Treasure Valley area.

Non-Federal actions are likely to continue affecting ESA-listed fish species. The cumulative effects in the action area are difficult to analyze due to the uncertainties associated with non-Federal actions, and ongoing changes to the region's economy. Whether those effects will increase or decrease in the future is not known; however, based on the subpopulation and growth trends identified in this section, the adverse effects of non-Federal actions are likely to increase. NMFS expects the environmental baseline to remain static or decrease slightly due to ongoing non-Federal actions.

2.1.5 Conclusion

After reviewing the best available scientific and commercial information regarding the biological requirements and the status of the Snake River spring/summer Chinook salmon and Snake River steelhead considered in this Opinion, the environmental baseline for the action area, the effects of the emergency action, and the cumulative effects, NMFS concludes that the action, is not likely to jeopardize the continued existence of these species. It was estimated in 2004 that approximately 2.7 million wild spring/summer Chinook salmon and 1.53 million wild steelhead would migrate out of the Snake River Basin (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/04outmigration.pdf). The loss of steelhead and spring/summer Chinook within 2 miles of Nick Creek and 3 miles of the WF Buckhorn Creek is unlikely to jeopardize the continued existence of either ESU since effects were localized within a 5 mile area, habitat was fair for spring/summer Chinook salmon, and the major pulse of chemicals from the retardant drop would likely of lasted a few hours to a few days. The retardant drop does impact the interim recovery targets for the SFSR which are 9,200 for spring/summer Chinook salmon and 4,000 steelhead (Table 2). This incident potentially killed 2,606 Chinook salmon and 2,978 steelhead. Take from this incident would be a one time occurrence, affecting juveniles within a small portion of the SFSR. NMFS is quantifying a worst case scenario that 100% mortality occurred within all 5 miles of Nick Creek and the WF Buckhorn Creek. NMFS believes that under this worst case scenario the mortality numbers are likely high, as it is reasonable to assume from available information that the Fire-Trol chemical was diluted to a point where less then 5 miles of stream were toxic enough to result in harm and death of listed fish species. Take that occurred from the retardant drop did not jeopardize the continued existence of Snake River spring/summer Chinook salmon and Snake River steelhead because the incident likely only affected 6-14 adult steelhead and 6-8 adult Chinook salmon as mentioned above in section 2.1.3.1. These numbers are a small percentage of the recovery targets for the SFSR.

Similarly, based on a review of the best available scientific and commercial information regarding the status of the Chinook salmon critical habitat and proposed critical habitat for

steelhead considered in this Opinion, the environmental baseline for the action area, the localized and short duration of the effects of the emergency action, and the cumulative effects, NMFS concludes that the action, is not likely to destroy or adversely modify proposed or designated critical habitat. These conclusions are based on the following considerations: (1) small amount of area affected from the retardant drop (up to 5 miles) compared to that available in the Buckhorn Creek watershed; and (2) the limited duration of effects.

2.1.6 Conservation Recommendations

Section 7 (a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. The following recommendations are discretionary measures that NMFS believes are consistent with this obligation and therefore should be carried out by the PNF:

1. When using retardant and water drops in areas that "may affect" listed species, and to make drops more accurate, the use of heavy helicopters instead of heavy, fixed-wing air tankers is recommended.

2. The PNF should strictly adhere to their Wildland Fire Suppression Programmatic (Wagoner and Burns 2001) and review this document, along with sensitive areas where listed species occur, annually before fire season. Forest personnel included in this review should include all pertinent staff and Line Officers using these guidelines (dispatch, Fire Management Officers, Incident Commanders, fire fighters, biologists, etc.).

3. The PNF should make every effort possible to get out to a site immediately after an emergency action, which falls outside programmatic provisions, in order to document the extent of the effect and possible take.

4. The PNF should follow the emergency consultation guidelines developed by the Level One Team, particularly the part that deals with notifying the Services quickly following the incident so that minimization/avoidance measures can be provided.

5. The PNF should carefully evaluate all future actions within the WF Buckhorn watershed for at least 4 years in order to limit further impacts to the interim recovery targets for the SFSR.

6. The PNF should conduct population monitoring and habitat surveys within Nick Creek and the WF Buckhorn Creek in order to better quantify habitat quality and fish density.

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

2.1.7 Reinitiation of Consultation

Reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If the amount or extent of taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that has an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) if a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). In these instances of emergency consultation, reinitiation is only likely to occur related to new information revealing effects not previously considered.

To reinitiate consultation, contact the Idaho State Office Habitat Office of NMFS and refer to the NMFS number assigned to this consultation (2005/00201).

2.2 Incidental Take Statement

Section 9(a)(1) of the ESA prohibits the taking of listed species without a specific permit or exemption. Protective regulations adopted pursuant to Section 4(d) extends the prohibition to threatened species. Among other things, an action that harasses, wounds, or kills an individual of a listed species or harms a species by altering habitat in a way that significantly impairs its essential behavioral patterns is a taking (50 CFR 222.102). Incidental take refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(o)(2) exempts any taking that meets the terms and conditions of a written incidental take statement from the taking prohibition. Take prohibitions of the ESA do not apply to an ESU that is proposed for listing until it is placed on the list of threatened or endangered species at the conclusion of the listing process. Therefore, this incidental take statement will not be effective for any ESU that is proposed for listing during this consultation until that ESU is listed, and the conference portion of this opinion is confirmed by NMFS as a biological opinion issued through formal consultation.

This concludes the conference for the Nick Fire Retardant Drop Emergency Consultation. You may ask NMFS to confirm the conference opinion as a biological opinion issued through formal consultation if Snake River resident *O. mykiss* are listed, and Snake River steelhead critical habitat is designated. The request must be in writing. If NMFS reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, NMFS will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

After listing of Snake River resident *O. mykiss* as threatened, designation of critical habitat for Snake River steelhead, and any subsequent adoption of the conference opinion, the PNF shall request reinitiation of consultation if: (1) the amount or extent of take of incidental take is exceeded; (2) new information reveals effects of the action that may affect the species or critical habitat in a manner or to an extent not considered in this conference opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the species or critical habitat that was not considered in this conference opinion; or a new species is listed or critical habitat designated that may be affected by the action.

The incidental take statement provided in this conference opinion does not become effective until resident *O. mykiss* are listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the proposed and critical habitat has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the species and habitat may occur between the listing of Snake River *O. mykiss* and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation.

2.2.1 Amount or Extent of Take

NMFS expects that the emergency actions are reasonably certain to have resulted in incidental take of ESA-listed Snake River spring/summer Chinook salmon and steelhead because listed species are known to occur in the action area. Lethal take likely occurred to ESA-listed fish within the retardant drop area and potentially up to 5 miles downstream into WF Buckhorn Creek. Water quality within Nick Creek and WF Buckhorn Creek was affected from the Fire-Trol retardant drop. The duration of water quality effects from the Fire-Trol is difficult to measure. Most of the retardant has likely been washed out of the area and diluted. Effects could last longer from the continual washing of contaminated soils and vegetation into Nick Creek, but is expected to be minimal. This continual washing of contaminated material from the riparian area should be less in their extent of effects to water quality since the amount of retardant will be significantly less and some of the toxic chemicals within it will have begun to break down from time and exposure to the environmental elements. The duration of chronic effects resulting from leaching of Fire-Trol chemicals from soil and/or vegetation from riparian areas within Nick Creek are dependent upon rainfall and weather conditions. Dry weather periods could prolong the effects of these chemicals in the environment. NMFS expects that these effects from leaching of nitrates and sodium ferrocyanide are expected to last no longer then one full year. Rain and snow is expected to wash away and dilute remaining components of the Fire-Trol LCG-R.

Possible effects from retardant in stream pools and along the bank of Nick Creek could become more toxic with time due to exposure to ultraviolet light. Those effects should be limited to a short-term duration of 3 months or less, due to the likelihood of higher flows washing the settled

retardant downstream and off of instream boulders. Effects to the macroinvertebrate communities from the Fire-Trol drop could last up to several years for full species richness to re-colonize the 5 miles of Nick Creek and WF Buckhorn Creek.

Effects from the Fire-Trol drop resulting in a reduction of macroinvertebrate densities and from the continual washing of contaminated material from the riparian area into Nick Creek are unquantifiable because of the uncertainty of initial retardant concentrations and the variability of environmental factors. Effects are not expected to be measurable as long-term harm (over several years) to habitat features or to salmonid behavior or population levels.

Based on the effects described within this document, it is reasonably certain that the emergency action will have a localized (up to 5 miles from the retardant drop area), short-term (up to 1 year), negative effects to Nick Creek and WF Buckhorn Creek. Lethal take most likely occurred within the first few hours to days after the retardant drop and up to a few months for sublethal effects.

Lethal and sublethal effects are expected to have occurred to both Snake River steelhead and spring/summer Chinook salmon. As discussed in detail in the Effects Analysis section of this BO, an estimated 2,978 steelhead and 2,606 Chinook salmon parr were presumed killed by the retardant drop. Assuming a survival rate of 0.2 %, 100% mortality of those Chinook salmon and steelhead parr would result in a corresponding loss of 6-8 returning adult Chinook salmon and 6 to 14 returning adult steelhead, 3 to 4 years from now. This take is estimated by using the best scientific data available.

2.2.2 Effect of Take

In this Opinion, NMFS determines that this level of anticipated take did not result in jeopardy to Snake River spring/summer Chinook salmon or steelhead.

2.2.3 Recommendations Provided to Minimize Take

Typically when emergency consultation is initiated, NMFS provides a list of initial recommendations to the action agency to avoid, minimize, or mitigate effects to ESA-listed fish species from the emergency action. These recommendations typically include a summary of emergency consultation procedures as well as a series of general recommendations to avoid or minimize occurrence of additional effects.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The consultation requirements of Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions, or proposed actions, that may adversely affect EFH. Adverse effects include the direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside EFH, and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that may be taken by the action agency to conserve EFH.

The Pacific Fishery Management Council designated EFH for groundfish (PFMC 1998a), coastal pelagic species (PFMC 1998b), Chinook salmon, coho salmon, and Puget Sound pink salmon (PFMC 1999). The emergency action and action area for this consultation are described in the Introduction to this document. The action area includes areas designated as EFH for various life-history stages of Snake River spring/summer Chinook salmon (PFMC 1999). The effects of the emergency action on Chinook salmon EFH include: (1) the degradation of water quality through the introduction of chemical contaminants from the fire retardant, (2) contamination of substrate, and (3) a reduction in food base from the chemical contaminants killing local macroinvertebrate communities.

3.1 Conclusion

NMFS concludes that the emergency action may adversely affect designated EFH for Snake River spring/summer Chinook salmon.

3.2 EFH Conservation Recommendations

NMFS believes that the six conservation measures mentioned above in section 2.1.6 of this Opinion are applicable to Chinook salmon EFH and NMFS incorporates each of those measures here as EFH conservation recommendations.

3.3 Statutory Response Requirement

Federal agencies are required to provide a detailed written response to NMFS' EFH conservation recommendations within 30 days of receipt of these recommendations (50 CFR 600.920(j)(1)). The response must include a description of measures proposed to avoid, mitigate, or offset the adverse effects that the activity has on EFH. If the response is inconsistent with the EFH

conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

In response to increased oversight of overall EFH program effectiveness by the White House Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, in your statutory reply to the EFH portion of this consultation, we ask that you clearly identify the number of conservation recommendations accepted.

3.4 Supplemental Consultation

The PNF must reinitiate EFH consultation with NMFS if the emergency action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600.920(k)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

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

4.1 Utility

NMFS has concluded that the Nick Fire retardant drop is not likely to jeopardize the affected ESUs. This consultation will be posted on the NMFS Northwest Region's web site (http://www.nwr.noaa.gov). The format and naming adheres to conventional standards for style.

4.2 Integrity

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

4.3 Objectivity

The following categories of information describe the objectivity of the consultation:

1. ***Information Product Category:*** Natural Resource Plan.

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

3. ***Best Available Information:*** This consultation and supporting documents use the best available information, as referenced in the literature cited section. The analyses in this biological opinion/EFH consultation contain more background on information sources and quality.

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

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

5 LITERATURE CITED

Adams. R., and D. Simmons. 1999. Ecological Effects of Fire Fighting Foams and Retardants. Conference Proceedings. Australian Bushfire Conference, Albury. July 1999. http://www.csu.edu.au/special/bushfire99/papers/adams/

BRT (Biological Review Team). 1997. Status review update for West Coast steelhead from Washington, Idaho, Oregon, and California. National Marine Fisheries Service, West Coast Steelhead BRT, Portland, Oregon.

BRT. 2003. Updated status of Federally listed ESUs of West Coast salmon and steelhead. U.S. Department of Commerce, National Marine Fisheries Service, Northwest Fisheries Science Center and Southwest Fisheries Science Center (July 2003). http://www.nwr.noaa.gov/AlseaResponse/20040528/brtusr.html

Buhl. K.J., and S. J. Hamilton. 1998. Acute Toxicity of Fire-Retardant and Foam-Suppressant Chemicals to Early Life Stages of Chinook Salmon (*Oncorhynchus Tshawytscha*). Environmental Toxicology and Chemistry. Vol. 17, No. 8. pp. 1589-1599.

Buhl. K.J., and S. J. Hamilton. 2000. Acute Toxicity of Fire-Control Chemicals, Nitrogenous Chemicals, and surfactants to rainbow Trout. Transactions of the American Fisheries Society. 129: 408-418.

Busby, P. J., T. C. Wainwright, G. J. Bryant, L. J. Lierheimer, R. S. Waples, F. W. Waknitz, and I. V. Lagomarsino. 1996. Status review of west coast steelhead from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA Technical Memo. NMFS-NWFSC-27.

Calfee, R. D., and E. E. Little. 2003a. Effects of a Fire-Retardant Chemical to Fathead Minnows in Experimental Streams. Environ Sci and Pollut Res (ESPR). Vol. 10, No. 5. pp. 296-300.

Calfee, R. D., and E. E. Little. 2003b. The Effects of Ultraviolet-B Radiation on the Toxicity of Fire-Fighting Chemicals. Environmental Toxicology and Chemistry. Vol. 22, No. 7 pp. 1525-1531.

Caughley, G. 1994. Directions in conservation biology. Journal of Animal Ecology 63:215–244.

CBFWA (Columbia Basin Fish and Wildlife Authority). 2001. Draft Clearwater Subbasin Summary. Submitted to the Northwest Power Planning Council, May 25, 2001.

Cooney, T. 2003. Snake River Basin steelhead. In: Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead: draft report (Co-manager review draft), February 19, 2003, p. B7-B23. National Marine Fisheries Service, West Coast Salmon Biological Review Team. (Individual authors not specified in publication.)

Coutant, C.C. 1999. Perspectives on Temperature in the Pacific Northwest's Fresh Waters. Environmental Sciences Division Publication 4849 (ORNL/TM 1999/44), Oak Ridge National Laboratory, Oak Ridge, Tennessee. 108 p.

Diamond, J.M. 1984. 'Normal' extinction of isolated populations. Extinctions (ed. M.H. Nitecki), pages 191-246. Chicago University Press, Chicago. Cited in: Caughley (1994).

Diamond, J. 1989. Overview of recent extinctions. Conservation for the Twenty-First Century (eds D. Western, and M. Pearl), pp. 37- 41. Oxford University Press. New York. Cited in: Caughley (1994).

Eisler, R., D. R. Clark, Jr., S. N. Wiemeyer, and C. J. Henny. 1999. Sodium cyanide hazards to fish and other wildlife from gold mining operations. Pages 55-67 in Azcue, J. M. (ed.). Environmental impacts of mining activities: emphasis on mitigation and remedial measures. Springer-Verlag, Berlin.

Faurot, M., and D.C. Burns. 2001. Biological Assessment for the potential effects of managing the Payette National Forest in the South Fork Salmon River section 7 watershed on Snake River spring/summer and fall Chinook salmon, Snake River steelhead, and Columbia River bull trout, Volume 25: Daddy Del's 2 placer exploration.

Faurot, M., and D.C. Burns. 2004. Biological Assessment for the Potential Effects of Managing the Payette National Forest in the South Fork Salmon River Section 7 Watershed on Snake River Spring/Summer and Fall Chinook Salmon, Snake River Steelhead, and Columbia River Bull Trout and Biological Evaluation for Westslope Cutthroat Trout Volume 26: Fitsum – Dutch Oven Prescribed Burn and Lower Meadow Creek Relocation.

Faurot, M., and D.C. Burns. 2005. Biological Assessment for the Potential Effects of Managing the Payette National Forest in the South Fork Salmon River Section 7 Watershed on Snake River Spring/Summer and Fall Chinook Salmon, Snake River Steelhead, and Columbia River Bull Trout and Biological Evaluation for Westslope Cutthroat Trout. Emergency: Nick Fire Retardant Drop. Payette National Forest. McCall, Idaho.

Fish Passage Center. 2001. http://www.fpc.org/fpc_docs/200 01.pdf

Fish Passage Center. 2004. Fish Passage Center Smolt Data, Current and Historical. 2501 S.W. First Ave., Suite 230, Portland, Oregon. http://www.fpc.org/adult.html

Gaikowski, M. P., S. J. Hamilton, K. J. Buhl, S. F. McDonald, and C. H. Summers. 1996. Ecotoxicology and Environmental Safety. Vol. 34, pp. 252-263.

Groot, C., and L. Margolis. 1991. Pacific salmon life histories. UBC Press, Vancouver, Canada. 564 p.

Healey, M.C. 1991. Life history of Chinook salmon (Oncorhynchus tshawytscha). Pages 311-393 In: Groot, C. and L. Margolis (editors). 1991. Pacific salmon life histories.

Henjum, M.G., J.R. Karr, D.L. Bottom, D.A. Perry, J.C. Bednarz, S.G. Wright, S.A. Beckwitt and E. Beckwitt. 1994. Interim Protection for Late successional Forests, Fisheries and Watersheds. National Forests East of the Cascade Crest, Oregon and Washington. A Report to the United States Congress and the President. The Wildlife Society, Bethesda, MD.

IDFG (Idaho Department of Fish and Game); Nez Perce Tribe and Shoshone-Bannock Tribes. 1990. Salmon River Subbasin Salmon and Steelhead Production Plan, September 1, 1990. Columbia Basin System Planning.

IDFG (Idaho Department of Fish and Game). 1996. 1996-2000 Fisheries Management Plan. Boise, ID.

Independent Scientific Group. 1996. Return to the River: Restoration of Salmonid Fishes in the Columbia River Ecosystem. Northwest Power Planning Council. Portland, Oregon. 500 p.

Kiefer, S., M. Rowe, and K. Hatch. 1992. Stock Summary Reports for Columbia River Anadromous Salmonids, Volume V: Idaho Final Draft for The Coordinated Information System. Idaho Department of Fish and Game, Boise, Idaho.

Laurance, W.F. 1991. Ecological correlates of extinction proneness in Australian tropical rain forest mammals. Conservation Biology. Vol. 5, No.1. pp. 79-89.

Lee, D. C., J. R. Sedell, B. E. Rieman, R. F. Thurow, and J. E. Williams. 1997. Broadscale Assessment of Aquatic Species and Habitats. Volume III, Chapter 4. U.S. For. Serv., Gen. Tech. Rep. PNW-GTR-405. Portland, Oregon.

Little, E., and R. D. Calfee. 2000. The Effects of UVB Radiation on the Toxicity of Fire-Fighting Chemicals. U.S. Geological Survey, Columbia Environmental Research Center. Final Report to USDA Forest Service Wildland Chemical Systems, Missoula, MT.

Little, E., and R. D. Calfee. 2002. Effects of Fire-Retardant Chemical Products on Fathead Minnows in an Experimental Stream. U.S. Geological Survey, Columbia Environmental Research Center (CERC). Submitted to USDA Forest Service Wildland Chemical Systems, Missoula, MT. CERC Ecology Branch Fire Chemical Report: ECO-04. http://www.cerc.usgs.gov/pubs/center/pdfDocs/ECO-04.PDF.

LRMP. USDA Forest Service. 2003. Payette National Forest Land and Resource Management Plan. July 2003.

Lytle. D.A., and B.L. Peckarsky. 2001. Spatial and Temporal Impacts of a Diesel Fuel Spill on Stream Invertebrates. Freshwater Biology (2001). Vol. 46. p. 693-704.

Mantua, N.J., S.R. Hare, Y. Zhang, J.M. Wallace, and R.C. Francis. 1997. A Pacific interdecadal climate oscillation with impacts on salmon production. Bulletin of the American Meteorological Society 78:1069-1079.

Marmorek, D.R., and C.N. Peters, editors. 1998. Plan for analyzing and testing hypotheses (PATH): Preliminary decision analysis report on Snake River spring/summer chinook. ESSA Technologies Limited, Vancouver, British Columbia.

Maser, C. and J.R. Sedell. 1994. From the Forest to the Sea: The Ecology of Wood in Streams, Rivers, Estuaries, and Oceans. St. Lucie Press, Delray Beach, Florida.

Matthews, G.M. and R.S. Waples. 1991. Status review for Snake River spring and summer chinook salmon. U.S. Department of Commerce, NOAA Technical Memorandum NMFS F/NWC-200, Seattle, WA., 75 p.

McClure, M. M., E. E. Holmes, B. L. Sanderson, and C. E. Jordan. 2003. A large-scale, multispecies risk assessment: anadromous salmonids in the Columbia River Basin. Ecological Applications 13:964-989.

McClure, M., B. Sanderson, E. Holmes, C. Jordan, P. Kareiva, and P. Levin. 2000. A standardized quantitative analysis of the risks faced by salmonids in the Columbia River basin. National Marine Fisheries Service, Northwest Fisheries Science Center, Cumulative Risk Initiative, Draft Report, Seattle, Washington. April 7.

McElhany, P., M. Ruckleshaus, M. J. Ford, T. Wainwright, and E. Bjorkstedt. 2000. Viable salmon populations and the recovery of evolutionarily significant units. U.S. Department of Commerce, National Marine Fisheries Service, Northwest Fisheries Science Center, NOAA Technical Memorandum NMFS-NWFSC-42. 156 p. http://www.nwfsc.noaa.gov/publications/techmemos/tm42/tm42.pdf

McIntosh, B.A., J.R. Sedell, J.E. Smith, R.C. Wissmar, S.E. Clarke, G.H. Reeves, and L.A. Brown. 1994. Management History of Eastside Ecosystems: Changes in Fish Habitat Over 50Years, 1935 to 1992. USDA Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-321. February.

MSDS (Material Safety Data Sheet). 1999. Fire-Trol Holdings, L.L.C. Fire-Trol© LCG-R, Liquid Concentrate. December 30, 1999.

NMFS (National Marine Fisheries Service). 1995. Proposed recovery plan for Snake River salmon. NOAA Fisheries, Portland, OR. 364 p. Norris, L.A., and W.L. Webb. 1989. Effects of Fire Retardant on Water Quality. General Technical Report PSW-109. USDA, Forest Service. Berkeley, California, pp. 79-86.

NMFS (National Marine Fisheries Service). 1999. The habitat approach: implementation of Section 7 of the Endangered Species Act for actions affecting the habitat of Pacific anadromous salmonids. Northwest Region, Habitat Conservation and Protected Resources Divisions, Portland, Oregon (August 26, 1999). http://www.nwr.noaa.gov/1habcon/habweb/habguide/habitatapproach_081999.pdf

NRC (National Research Council). 1996 . Upstream: salmon and society in the Pacific Northwest. National Academy Press, Washington, D.C. 452 p.

PFMC (Pacific Fishery Management Council). 1998a. Final environmental assessment/ regulatory review for Amendment 11 to the Pacific Coast Groundfish Fishery Management Plan. Pacific Fishery Management Council, Portland, Oregon (October 1998). http://www.pcouncil.org/groundfish/gffmp/gfa11.html

PFMC (Pacific Fishery Management Council). 1998b. The Coastal Pelagic Species Fishery Management Plan: Amendment 8. Pacific Fishery Management Council, Portland, Oregon (December 1998). http://www.pcouncil.org/cps/cpsfmp.html

PFMC (Pacific Fishery Management Council). 1999. Amendment 14 to the Pacific Coast Salmon Plan. Appendix A: description and identification of essential fish habitat, adverse impacts and recommended conservation measures for salmon. Pacific Fishery Management Council, Portland, Oregon (March 1999). http://www.pcouncil.org/salmon/salfmp/a14.html

Rhodes, J.J., D.A. McCullough, and F.A. Espinosa, Jr. 1994. A Coarse Screening Process for Potential Application in ESA Consultations. Columbia River Intertribal Fish Commission. Prepared under NMFS/BIA Inter-Agency Agreement 40ABNF3. December.

Russo, R. C. 1985. Ammonia, nitrite, nitrate. In Fundamentals of Aquatic Toxicology, Methods and Applications (G. M. Rand and S.R. Petrocelli, Eds.), pp. 455-469. Hemisphere, Washington, D.C.

Sedell, J.R. and J.L. Froggatt. 1984. Importance of Streamside Forests to Large Rivers: The Isolation of theWillamette River, Oregon, USA, from Its Floodplain by Snagging and Streamside Forest Removal. Internationale Vereinigung fur theoretische und angewandte Limnologie Verhandlungen 22:1828 1834.

Spence, B.C, G.A. Lomnicky, R.M. Hughes, R.P. Novitzki. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, Oregon. (December 1996). http://www.nwr.noaa.gov/1habcon/habweb/habguide/ManTech/front.htm

State of Idaho. 1999. 1998 303(d) List. Division of Environmental Quality.

TRT (Interior Columbia Basin Technical Recovery Team). 2003. Independent populations of chinook, steelhead, and sockeye for listed evolutionarily significant units within the Interior Columbia River Domain. Working draft. NOAA Fisheries, Northwest Fisheries Science Center, Seattle, WA.

USDA (U.S. Department of Agriculture). 1983. Influence of Forest and Rangeland Management on Anadromous Fish Habitat in Western North America. Forest Service. Pacific Northwest Forest and Range Experiment Station. February 1983. GTR PNW-149.

USFS (U.S. Forest Service). 2004. Wildland Fire Chemical Systems: Toxicity and Environmental Issues. http://www.fs.fed.us/rm August 30, 2004.

USEPA (U.S. Environmental Protection Agency). 1980. Ambient water Quality Criteria for Cyanides. USEPA Rep 440/5-80-037, pp. 1-72.

Vucetich, J. A., T.A. Waite, L. Qvarnmark, and S. Ibargüen. 1999. Population variability and extinction risk. Conservation Biology. Vol. 14, No.6. pp. 1704-1714.

Wagoner, L., and D.C. Burns. 2001. Biological Assessment for the potential effects of managing the Payette National Forest in the South Fork Salmon River section 7 watershed on Snake River spring/summer and fall Chinook salmon, Snake River steelhead, and Columbia River bull trout, and Biological Evaluation for Westslope Cutthroat Trout, Volume 24: Ongoing Actions.

Waples, R.S. 1991. Definition of "species" under the Endangered Species Act: application to Pacific Salmon. U.S. Department of Commerce, National Marine Fisheries Service, Northwest Fisheries Science Center, NOAA Technical Memorandum NMFS F/NWC-194. http://www.nwfsc.noaa.gov/publications/techmemos/tm194/waples.htm

Wissmar, R.C., J.E. Smith, B.A. McIntosh, H.W. Li, G.H. Reeves, and J.R. Sedell. 1994. Ecological Health of River Basins in Forested Regions of Eastern Washington and Oregon. Gen. Tech. Rep. PNW-GTR-326. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Portland, OR. 65 p.

Appendix A. Federal Register Notices for Rules that list species, designate critical habitat, or apply protective regulations to ESUs considered in this consultation. (Listing status "T" means listed as threatened under the ESA, "E" means listed as endangered, and "P" means proposed for listing or proposed for designation as critical habitat; see also, proposed listing determinations for 27 ESUs of West Coast salmonids at 69 FR 33102, June 14, 2004, and proposed designation of critical habitat for 13 ESUs of Pacific salmon and steelhead at 69 FR 74572, December 14, 2004).

Species ESU	Listing Status	Critical Habitat	Protective Regulations
Chinook salmon (*Oncorhynchus tshawytscha*)			
Lower Columbia River	T 3/24/99; 64 FR 14308	P 12/14/04; 69 FR 74572	7/10/00; 65 FR 42422
Upper Willamette River	T 3/24/99; 64 FR 14308	P 12/14/04; 69 FR 74572	7/10/00; 65 FR 42422
Upper Columbia River spring-run	E 3/27/99; 64 FR 14308	P 12/14/04; 69 FR 74572	ESA Section 9 applies
Snake River spring / summer run	T 4/22/92; 57 FR 14653	10/25/99; 64 FR 57399	7/10/00; 65 FR 42422
Snake River fall-run	T 6/3/92; 57 FR 23458	12/28/93; 58 FR 68543	7/10/00; 65 FR 42422
Chum salmon (*O. keta*)			
Columbia River	T 3/25/99; 64 FR 14508	P 12/14/04; 69 FR 74572	7/10/00; 65 FR 42422
Coho salmon (*O. kisutch*)			
Lower Columbia River	P 6/14/04; 69 FR 33102	Not applicable	Not applicable
Oregon Coast	P 6/14/04; 69 FR 33102	P 12/14/04; 69 FR 74572	Not applicable
Southern Oregon / Northern California Coasts coho	T 5/6/97; 62 FR 24588	5/5/99; 64 FR 24049	7/18/97; 62 FR 68479
Sockeye salmon (*O. nerka*)			
Snake River	E 11/20/91; 56 FR 58619	12/28/93; 58 FR 68543	ESA Section 9 applies
Steelhead (*O. mykiss*)			
Lower Columbia River	T 3/19/98; 63 FR 13347	P 12/14/04; 69 FR 74572	7/10/00; 65 FR 42422
Upper Willamette River	T 3/25/99; 64 FR 14517	P 12/14/04; 69 FR 74572	7/10/00; 65 FR 42422
Middle Columbia River	T 3/25/99; 64 FR 14517	P 12/14/04; 69 FR 74572	7/10/00; 65 FR 42422
Upper Columbia River	E 8/18/97; 62 FR 43937	P 12/14/04; 69 FR 74572	ESA Section 9 applies
Snake River Basin	T 8/18/97; 62 FR 43937	P 12/14/04; 69 FR 74572	7/10/00; 65 FR 42422