Supplemental Biological Opinion on Impacts of Non-Treaty Fisheries in the Columbia River Basin in Years 2006 and 2007, on Winter Steelhead Listed Under the Endangered Species Act and Magnuson-Stevens Act Essential Fish Habitat Consultation.

Action Agency: National Marine Fisheries Service (NMFS)

Species/Distinct Population Segment (DPS) Affected:

Species	Distinct Population Segment	Present Status	Federal Register Notice	
Steelhead (*O. mykiss*)	Lower Columbia River	Threatened	71 FR 834	1/05/06
	Upper Willamette River	Threatened	71 FR 834	1/05/06
	Middle Columbia River	Threatened	71 FR 834	1/05/06

Activities considered: To conduct fisheries proposed for 2006 and 2007 in the Columbia River Basin by the States of Oregon and Washington

Consultation conducted by: NMFS, Sustainable Fisheries Division, Northwest Region.
Consultation Number: F/NWR/2006/00223

The U.S. v Oregon parties entered into a three year agreement regarding the Columbia River fisheries (U.S. v Oregon Parties 2005), and submitted a biological assessment of impacts of Treaty Indian and non-Treaty fisheries included in the agreement (LeFleur 2005a, LeFleur 2005b). The National Marine Fisheries Service (NMFS) wrote a biological opinion on impacts of Treaty Indian and non-Treaty fisheries in the Columbia River Basin in years 2005-2007 (NMFS 2005a). However, that opinion did not consider impacts to listed winter steelhead associated with non-Treaty mainstem fisheries below the Dalles Dam. Non-Treaty mainstem fisheries with impacts to listed winter steelhead in 2005 were covered by an earlier biological opinion (NMFS 2005b). It was understood that the effects to winter steelhead from fisheries in 2006 and 2007 would be considered through a subsequent consultation that would be incorporated as a supplement to the 2005-07 Interim Agreement opinion. Consultation was delayed to provide more time to develop necessary elements of the proposed fishery and the associated effect to winter steelhead. On January 6, 2006, the U.S. v. Oregon Technical Advisory Committee (TAC) submitted to NMFS a supplemental biological assessment concerning impacts to listed winter steelhead in mainstem non-Treaty fisheries below the Dalles Dam for 2006 and 2007 (Ellis 2006). In this supplemental biological opinion, NMFS reviews information regarding the impacts to ESA listed winter steelhead associated with the proposed fisheries. The Incidental Take Statement describes the amount of take expected to occur as the result of the proposed fisheries. This biological opinion has been prepared in accordance with section 7 of the Endangered Species Act (ESA), as amended (16 U.S.C. 1531 et seq.). A complete administrative record of this consultation is on file with NMFS, Sustainable Fisheries Division in Seattle, Washington.

Approved by: _____ **Date:** _____
D. Robert Lohn, Regional Administrator

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INTRODUCTION

The National Marine Fisheries Service (NMFS) is required under section 7 of the Endangered Species Act (ESA) to conduct a consultation that considers the effects of the proposed U.S. v. Oregon Columbia River fisheries on ESA-listed species. The proposed fisheries are to be conducted pursuant to the 2005-2007 Interim Management Agreement for Upper Columbia River Chinook, Sockeye, Steelhead, Coho and White Sturgeon (U.S. v. Oregon Parties 2005). The parties to the 2005-2007 Interim Management Agreement are: the states of Oregon, Washington and Idaho, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Yakama Indian Nation, the Shoshone-Bannock Tribes, the Bureau of Indian Affairs, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (hereafter "Parties.") The Parties completed an Interim Agreement in 2005. The NMFS completed a section 7 consultation on the Interim Agreement and concluded that the proposed fisheries are not likely to jeopardize any ESA-listed species (NMFS 2005a). As explained below, the 2005 biological opinion did not consider impacts to winter steelhead. This supplemental biological opinion considers the effects of fisheries pursuant to the 2005-07 Interim Agreement on listed steelhead with particular attention to associated winter populations.

CONSULTATION HISTORY

Steelhead Distinct Population Segments (DPS) in the Columbia River that include winter steelhead populations were first listed in 1998 and 1999 (See Table 1). Impacts to listed Columbia River winter steelhead populations in 1998, 1999 and 2000 were considered in three separate consultations (NMFS 1998, NMFS 1999, and NMFS 2000, respectively).

The U.S. v Oregon parties entered into an Agreement in 2001 regarding winter, spring, and summer season fisheries (U.S. v Oregon parties 2001). NMFS conducted an Endangered Species Act (ESA) Section 7 consultation on the Agreement and associated Biological Assessments submitted by the tribes and states, respectively (Speaks 2000; Tweit and Norman 2000). One of the provisions considered during the consultation was that the combined incidental mortality rate in all non-Treaty fisheries would be 2 percent or less for each of the affected steelhead DPSs. NMFS concluded in its biological opinion that the implementation of the fisheries as proposed would not jeopardize any of the affected DPSs (NMFS 2001).

In 2002, the states of Oregon and Washington implemented their first full fleet commercial spring Chinook salmon selective tangle net fishery, contemplated in the Agreement. The U.S. v. Oregon Technical Advisory Committee (TAC) estimated post-season that the incidental mortality rate on winter steelhead during the 2002 fishery, including Upper Willamette steelhead and the winter run populations of the Lower Columbia River and Middle Columbia River Distinct Population Segments (DPSs), likely ranged between 5.6 to 14.5 percent (TAC 2003). Because the incidental take associated with this fishery in 2002 exceeded the take exemptions of the original consultation, and because this fishery was to be conducted in 2003 and beyond, NMFS reinitiated its consultation related to the 2001 Agreement in 2003.

The Washington Department of Fish and Wildlife (WDFW) and Oregon Department of Fish and Wildlife (ODFW) provided NMFS with a list of steps to be taken to modify the management guidelines for the commercial spring Chinook tangle net fishery in 2003 (LeFleur 2003). These additional management guidelines were intended to reduce impacts on winter steelhead and to ensure that all fisheries, and particularly the commercial spring Chinook tangle net fishery, were carried out within the ESA constraints specified in the 2001 biological opinion (NMFS 2001). These additional management guidelines amended the 2001 Interim Management Agreement by describing in more detail how the non-Treaty commercial spring Chinook tangle net fishery was to be managed (LeFleur 2003). In 2003, NMFS wrote a supplemental biological opinion and a supplemental Environmental Assessment (EA) based on the States' new management guidelines (NMFS 2003a and 2003b). NMFS concluded in its supplemental biological opinion that the modified management provisions would allow fisheries to be managed within the previously defined incidental take limits and would not jeopardize any of the affected DPSs (NMFS 2003).

On January 2, 2004, the WDFW and ODFW submitted a biological assessment of the impacts of the fisheries on the listed species (LeFleur and Melcher 2004) and proposed to modify the provisions of the management plan that formed the basis of the 2001 Agreement among the parties, the 2001 biological opinion (NMFS 2001), and the 2003 supplemental biological opinion (NMFS 2003). WDFW and ODFW proposed that NMFS allow harvest rates up to 7 percent for listed steelhead DPSs in 2004 and 2005. The objective of their proposal was to allow increased access to harvestable, non-listed spring Chinook.

After the States submitted the 2004 biological assessment, NMFS, in a letter dated January 22, 2004, requested further clarification and information (Dygert 2004). In response to this request the States prepared a revised biological assessment that decreased the proposed harvest rate from 7 percent to 6 percent, with a management goal of 5 percent, for 2004 and 2005, which was submitted on February 13, 2004. However, NMFS had outstanding questions, and the 2004 fishery concluded before these questions were resolved. The 2004 fishery was managed subject to the still applicable 2% harvest rate constrains.

After the 2004 fishery concluded, the States formed a work group that included WDFW and ODFW staff, harvest managers, steelhead biologists, and population biologists to address outstanding issues. NMFS staff also attended the work group meetings. The work group was formed primarily to respond to questions and issues regarding management of wild winter steelhead in the Lower Columbia River commercial fishery as proposed under the current consultation. On November 2, 2004, the States submitted an addendum to the February 13, 2004 biological assessment with a proposal for the commercial spring Chinook fishery in the Lower Columbia River in 2005 (LeFleur 2004b).

The States proposed to increase the allowable incidental take limit for winter steelhead populations in three Columbia River DPSs affected by the non-Treaty commercial spring Chinook tangle net fishery in 2005 from 2 percent to 6 percent, with a management guideline of 5 percent (LeFleur and Melcher 2004). The affected steelhead populations belong to the Upper Willamette River, Lower Columbia River, and Middle Columbia River steelhead DPSs. Most of the impacts to these three steelhead DPSs result from the commercial spring Chinook tangle net

fishery. On January 2005, NMFS completed its consultation on the states' proposal and completed a one-year supplemental biological opinion and a supplemental Environmental Assessment (EA) related to the proposed harvest rate of 6% (NMFS 2005a and 2005b, respectively). NMFS concluded in its supplemental biological opinion that a harvest rate of 6% for one year would not jeopardize any of the affected DPSs (NMFS 2005a). The 2005 winter and spring fisheries were managed under the terms of the 2001biological opinion (NMFS 2001), and with regards to the three affected steelhead DPSs, under the terms of the 2005 supplemental biological opinion.

In May 2005 the U.S. v Oregon parties entered into a 3-year Interim Management Agreement (2005-07) for year-round fisheries in the Columbia River Basin (U.S. v Oregon parties 2005), and submitted a biological assessment for Interim Management Agreement which did not include a proposal for incidental impacts to listed winter steelhead populations in the mainstem Columbia River (LeFleur 2005a, LeFleur 2005b). It was understood that the effects to winter steelhead from fisheries in 2006 and 2007 would be considered through a subsequent consultation that would be incorporated as a supplement to the 2005-07 Interim Agreement opinion. The states requested that consultation on the 2006 and 2007 fisheries be delayed to provide more time prior to the 2006 season to develop the related proposal.

On May 9, 2005 NMFS completed a biological opinion and an EA on the 2005-2007 Interim Management Agreement and associated Biological Assessment submitted by the parties (NMFS 2005c, NMFS 2005d), which superseded the January 2001 opinion (NMFS 2001) and will now remain in effect through 2007.

On January 9, 2006, the U.S. v. Oregon Technical Advisory Committee (TAC) submitted to NMFS a supplemental biological assessment concerning impacts to listed winter steelhead in mainstem non-Treaty fisheries below the Dalles Dam for 2006 and 2007 (Ellis 2006). The purpose of this supplemental biological opinion is to analyze the effects of incidental take of ESA-listed of Upper Willamette River, Lower Columbia River, and Middle Columbia River steelhead DPSs, and associated winter steelhead populations in particular, under the jurisdiction of NMFS associated non-Treaty fisheries in 2006 and 2007.

BIOLOGICAL OPINION

1. DESCRIPTION OF THE PROPOSED ACTION

1.1 Proposed Action

The action considered in the 2005 biological opinion (NMFS 2005c) was for the Federal parties to U.S. v Oregon to enter into an Interim Management Agreement with the non-Federal parties to the case regarding the management of year-round fisheries in the Columbia River Basin in 2005-2007. The fisheries considered in the 2005 Biological Opinion included winter, spring, summer, and fall season fisheries in the Columbia River Basin as proposed by the Columbia River treaty tribes (the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes

and Bands of the Yakama Indian Nation) and the states of Oregon and Washington (LeFleur 2005a, LeFleur 2005b). However, as described above, the 2005 biological opinion (NMFS 2005a) did not consider impacts to listed steelhead and particularly the effects to winter populations. On January 9, 2005, the U.S. v Oregon TAC submitted a supplemental biological assessment of impacts to winter steelhead in 2006 and 2007.

In this supplemental biological opinion NMFS considers incidental impacts to listed winter steelhead in mainstem non-Treaty fisheries below the Dalles Dam for 2006 and 2007. The states of Oregon and Washington propose to manage all mainstem Columbia River fisheries with incidental take of winter steelhead populations of 2% (Ellis 2006). The states propose managing subject to a 2% harvest mortality limit on the aggregate of returning listed winter-run steelhead. The proposed 2% incidental take limit is a cap and not a target. The states propose to manage their fishery to minimize the impacts to steelhead to the degree possible. The ESA listed species in the action area that are affected by the proposed fisheries are listed in Table 1.

Table 1. Species/Distinct Population Segment (DPS) affected by the proposed action.

Species	Distinct Population Segment	Present Status	Federal Register Notice	
Steelhead (*O. mykiss*)	Lower Columbia River	Threatened	71 FR 834	1/05/06
	Upper Willamette River	Threatened	71 FR 834	1/05/06
	Middle Columbia River	Threatened	71 FR 834	1/05/06

A key assumption of the proposal, discussed in detail in NMFS's 2005 opinion (NMFS 2005a), is that the incidental mortality rate for steelhead associated with the spring Chinook tanglenet fishery is the same for each of the affected steelhead DPSs. Although there are minor impacts to winter steelhead in mainstem recreational fisheries, virtually all of the impacts in 2006 and 2007 are expected to occur in the tanglenet commercial fishery targeting unlisted spring Chinook (Table 2). Nonetheless, mortality resulting from the recreational fishery is counted against the total mortality rate limit.

The catch-and-release mortality rate varies for different gear types, different species, and different fishing conditions, and those values are often not well known. Catch-and-release mortality rates have been estimated from available data and applied by the Technical Advisory Committee to U.S. v Oregon (TAC) in the calculation of impacts to listed fish evaluated in this consultation. At the February 5, 2004 Compact hearing the states adopted the TAC recommended mortality rates of 18.5% for steelhead captured and released using small mesh nets (≤ 4¼") and 30% for steelhead captured and released using large mesh nets (≥ 8"). Nets of intermediate mesh size are not used in the fishery because of higher associated mortality. These same mortality rates will be used again for estimating fishery-related incidental mortality in 2006 and 2007 unless new information becomes available during this time.

The states have developed a fishing plan for 2006 and 2007, which includes test fishing prior to every opening of the commercial tanglenet fishery to provide pre-fishery estimates of stock composition of spring Chinook and relative abundance of steelhead in the fishing area. The states will use this information in determining when it is appropriate to set a full fleet fishery and which gear restrictions, primarily mesh size restrictions, should be adopted. The states will be looking for a large percentage of Willamette hatchery spring Chinook in the catch and a low percentage of upriver spring Chinook. Information on the number of steelhead handled will be used to make decisions about specific gear configurations for specific open periods.

Table 2. The following is a list of non-Indian fisheries that are expected to occur during the timeframe when wild winter steelhead are present in the action area. The first 3 fisheries on the list are expected to result in incidental take of listed winter steelhead; the rest are not.

Fishery	time frame	Percent of the total anticipated impacts to winter steelhead.
Winter commercial sturgeon fishery	January – late February	1%
Winter commercial salmon fishery	Late February-June 15	94%
Mainstem sport fishery	January – mid-June 15	5%
Select Area sport fishery	January – mid-June 15	0%
Spring Chinook commercial fishery - Select Areas	February - June	0%
Smelt commercial fishery/test fishery	December - March	0%
Smelt recreational fishery	December - March	0%
Anchovy and herring commercial bait fishery	Year round	0%
Sturgeon recreational fishery	Year round	0%
Warmwater recreational fishery	Year round	0%
	Total	**100%**

The states will require the use of ≥8 inch mesh size in the first few open periods of the fishery when the relative abundance of Upper Willamette spring Chinook is high to minimize handling of steelhead. Additionally, the use of steelhead excluders for 2006 and 2007 is being strongly encouraged, but will not be mandatory. The states intend to collect additional information on the effectiveness of these nets and may require their use in future years. Information gathered in 2006 and 2006 on the steelhead excluder will be added to the data from previous years and tested to see if there is a difference in steelhead catch with or without a steelhead excluder.

1.1.1 Management of Steelhead Impacts

The management actions and consequent measures for the non-Treaty commercial spring Chinook tanglenet fishery introduced in the 2003 and 2005 supplemental biological opinions (NMFS 2003, NMFS 2005a) would remain in effect for 2006 and 2007.

1.1.1.1 TAC will provide a pre-season runsize forecast for winter steelhead prior to the start of the fishery each year. Maximum allowable mortality rates will be based on a percentage of this preseason runsize estimate. Some steelhead DPSs have both, winter and summer run components. By managing for a mortality rate on winter steelhead, the mortality rate estimates will be conservative for those affected DPSs with both run components.

1.1.1.2 TAC recommends using a 30% long-term mortality rate for nets that are 8-inch or larger and an 18.5% for the 4 1/4 inch mesh for winter steelhead. These rates will be applied to the estimated numbers of wild winter steelhead handled and released in the fishery in 2006 and 2007. TAC will review any new long-term survival study results and use these to modify the mortality estimates to be used in 2007 and beyond, as appropriate.

1.1.1.3 The fishery will be monitored daily to estimate the number of steelhead and spring Chinook handled, including the number of marked and unmarked fish. The ratio of steelhead observed versus the number of marked spring Chinook observed in the fishery will be multiplied by the number of spring Chinook landed to estimate total number of steelhead handled in the fishery. Spring Chinook landings will be tallied the day following each fishing period. Monitoring data and landing information will be used to calculate impacts on wild winter steelhead, based on the projected run size (the preseason forecast for 2006 is 16,000 fish) and the assumption that all of the steelhead caught through March are winter-run fish, and that 0.4% of the unmarked steelhead are hatchery-origin fish.. This information was updated at a TAC meeting on December 13, 2005.

1.1.1.4 The sport fishery impacts on wild winter steelhead were expected to be less than 0.1%. Expected recreational fishery impacts will be specified preseason and used to set appropriate take limits for the commercial spring Chinook tangle-net selective fishery.

1.1.1.5 The TAC will investigate the feasibility of in-season run size updates using counts at Willamette Falls and use them for future management if appropriate.

1.1.2 Management Actions to Minimize Steelhead Handle and Mortality

The following management provisions will be in effect in 2006 and 2007. As new information becomes available, some of the details may change, but the general principles will continue to apply for the duration of the agreement.

1.1.2.1 Large mesh nets (8" minimum and 9¾" maximum mesh sizes) will be used during the late February 2006 and 2007 time frame. Net length not to exceed 150 fathoms except for nets fitted with a steelhead excluder (175 fathoms). Red corks are required at 25-fathom intervals and red corks must be in contrast to the corks used in the remainder of the net.

1.1.2.2 Tanglenets with a maximum mesh size of 4 1/4-inch mesh will be used during the March 2006 and 2007 time frame. Based on analysis of steelhead size versus mesh size, it is estimated that approximately 96% of the steelhead will be tangled in this mesh size rather than gilled. Details of that analysis can be found in the TAC report titled "Steelhead Handle and Mortality Impacts in the 2002 Non-Treaty Spring Chinook Tangle Net Fishery" dated January 22, 2003.

1.1.2.3 Fishing time during mid-March or when wild steelhead are in greatest abundance will be reduced. The fishery will be managed to have minimal days of fishing during this time frame when it is expected that wild steelhead will be in greatest abundance in the lower Columbia River.

1.1.2.4 Voluntary use of steelhead excluders by the commercial fishers is encouraged. The excluder panel is designed to be incorporated at the top of the net and will pass steelhead completely through without being captured. The excluder panel is defined as being a minimum of 5 feet in depth and the mesh size is >12 inches.

1.1.2.5 Use of recovery boxes, short soak times, and reduced net length are mandatory. These restrictions are the same as those in place in 2005 and will be required during the entire winter/spring season. Each vessel participating in this fishery is required to have 2 operable recovery boxes or one box with two chambers. Operable recovery boxes require a flow of 16-20 gallons per minute to each chamber of the box(es). Each box must be operating during any time that the net is being retrieved or picked. These measures will help increase the overall survival of fish that are released.

1.1.2.6 Lighted buoys are required on each end of nets being fished between sunset and sunrise.

1.1.3 Monitoring Program

The following monitoring requirements would be in effect in 2006 and 2007. As new information becomes available, some of the details of the program may change, as appropriate, but monitoring will continue for the duration of the agreement.

1.1.3.1 Onboard monitoring will occur inseason and throughout the test fishery to determine species-specific encounter and mark rates for use in estimating cumulative impact rates.

1.1.3.2 Data will be summarized the day following each fishing period and reported to the fishery managers and the TAC.

1.2 Action Area

The action area as specified in the 2005 opinion encompasses the Columbia River and its tributaries from its mouth upstream to the Wanapum Dam, and in the Snake River up to the Washington/Idaho border (NMFS 2005c). In this supplemental opinion, NMFS' analysis focuses on the area downstream of the Dalles Dam.

2. STATUS OF SPECIES UNDER THE ENVIRONMENTAL BASELINE

In order to describe a species' status, it is first necessary to define precisely what "species" means in this context. Traditionally, one thinks of the ESA listing process as pertaining to entire taxonomic species of animals or plants. While this is generally true, the ESA also recognizes that there are times when the listing unit must necessarily be a subset of the species as a whole. A 'distinct population segment' (DPS) of steelhead (71 FR 834, January 5, 2006) are considered to be 'species,' as defined in Section 3 of the ESA. Lower Columbia River Steelhead, for example, is just such a DPS of the species *O. mykiss* and is considered a species under the ESA.

The discussion in this opinion is limited to the three steelhead DPSs with winter steelhead populations. These include Upper Willamette River, Lower Columbia River and Middle Columbia River steelhead DPSs listed as threatened under the ESA (Table 1). The status of these DPSs is described in the 2005 Biological Opinion (NMFS 2005c) which is incorporated here by reference. That information is updated and described in more detail in the following discussion, particularly to include abundance information for 2002, 2003, 2004 and estimates for 2005.

2.1 Life History and Critical Habitat of Affected Steelhead DPSs

The general life history characteristics of steelhead DPSs are described in the 2005 Biological Opinion (NMFS 2005) and are incorporated here by reference.

Critical habitat encompasses accessible reaches of all rivers (including estuarine areas and tributaries) within the range of each listed species. Critical habitat includes all waterways, substrate, and adjacent riparian zones below longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years). Critical habitat for Lower

Columbia River steelhead, Mid-Columbia River steelhead and Upper Willamette River steelhead was designated on September 2, 2005 (70 FR 52630). More detailed habitat information (i.e., specific watersheds and habitat features and special management considerations) for these three steelhead DPSs can be found in the designation and on the internet at *www.nwr.noaa.gov* (as of September 7, 2005). The final rule on critical habitat took effect on January 2, 2006. With respect to Lower Columbia River steelhead, Mid-Columbia River steelhead, and Upper Willamette River steelhead potentially affected by the proposed action, the rearing/migration corridor downstream of the spawning range is considered to have a high conservation value.

2.2 Status of Affected Steelhead DPSs

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

2.2.1 Distribution, Trends and Productivity

2.2.1.1 Lower Columbia River Steelhead DPS

The Lower Columbia River steelhead DPS includes naturally-produced steelhead returning to Columbia River tributaries on the Washington side between the Cowlitz and Wind rivers in Washington and on the Oregon side between the Willamette and Hood Rivers, inclusive. In the Willamette River, the upstream boundary of this DPS is at Willamette Falls. The Willamette/Lower Columbia Technical Review Team (WLC-TRT) identified historical demographically independent populations (Myers et al. 2002). Myers et al. (2002) hypothesized the DPS historically consisted of 17 winter-run populations and six summer-run populations, for a total of 23 populations. Of the 17 winter-run populations, three (Cispus River, Upper Cowlitz River, and Tilton River) are extirpated (Steel and Sheer 2002). In this supplemental biological opinion, we focus our discussion on the remaining 14 winter steelhead populations because these are the ones affected by the proposed action. Abundance data is available only for 11 of these 14 populations (three in Oregon and eight in Washington).

A comparison of the current and historically available habitat indicates that habitat has been reduced for most populations. Overall, about 75% or more of the historical habitat is currently available or present (Table 3).

Oregon Tributaries

The abundance of wild winter steelhead in Oregon's portion of the Lower Columbia DPS is monitored at dams in three basins, the Clackamas, Sandy and Hood. Recent abundance trends at these monitoring locations are shown in Table 4. These three monitoring stations intercept only part of the Lower Columbia DPS abundance in Oregon. The recent 5-year (2001-2005) average abundance in these basins was approximately 3,000 wild winter steelhead. Abundance in the Oregon basins in this DPS declined to very low numbers in the 1990s. Abundance increased in the Clackamas and Hood rivers in the early 2000s, peaking at 3,100 fish in the Clackamas in 2004 and at 1,034 in the Hood in 2002. The counts have declined since these recent peaks. The 2005 counts in the Hood and Sandy were similar to counts in the 1990s, while the Clackamas counts remained higher than the lows observed in the late 1990s.

Table 3. Historical populations of Lower Columbia River winter-run steelhead and loss of habitat from barriers[1] (Steel and Sheer (2002).

Population	Potential Current Habitat (Km)	Potential Historic Habitat (Km)	Current to Historical Habitat (%)
Cispus River	0	87	0
Tilton River	0	120	0
Upper Cowlitz River	6	358	2
Coweeman River	85	102	84
Lower Cowlitz River	542	674	80
South Fork Toutle River	82	92	89
North Fork Toutle River	209	330	63
Kalama River	112	122	92
North Fork Lewis	115	525	22
East Fork Lewis	239	315	76
Salmon Creek	222	252	88
Washougal River	122	232	53
Clackamas River	919	1,127	82
Sandy River	295	386	76
Lower Gorge Tributaries	46	46	99
Upper Gorge Tributaries	31	31	100
Hood River	138	138	99

[1] The potential current habitat is the kilometers of stream below all currently impassible barriers between a gradient of 0.5% and 4%. The potential historical habitat is the kilometers of stream below historically impassible barriers between a gradient and 0.5% and 6%. The current to-historical habitat ratio is the percent of the historical habitat that is currently available.

Washington Tributaries

Individual populations in the Washington portion of the Lower Columbia DPS are typically under 1,000 fish, except the South Fork Toutle and Kalama populations. The rest of the Washington populations in the DPS are smaller with several streams having escapements of less than 100 fish. It should be noted that the Green River up until 2005 and the Lewis through 1995 are only an index of the total population in those systems (Ellis 2006). Population abundances

have experienced alternating time periods of high and low survival rates. Average returns during these time periods can be used to show how the current abundances compares to historical abundance levels and how effectively abundance levels rebounded from years with poor smolt to adult survival rates. The time frame of 1984-1988, represents a period when smolt to adult survival rates were extremely high, while the time frame of 1996-2000 represents a period of extremely poor smolt to adult survival rates. The time period of 2001-2004 represents the recent period of improved smolt to adult survival rates.

Table 4. Abundance Trends Of Major Oregon Populations In The Lower Columbia DPS.

Year	Clackamas	Sandy	Hood
1984	1,238		
1985	1,225		
1986	1,432		
1987	1,318		
1988	1,773		
1989	1,249		
1990	1,487	3,065	
1991	829	1,995	
1992	2,106	2,918	697
1993	1,174	1,636	397
1994	1,218	1,567	378
1995	1,131	1,680	194
1996	203	536	270
1997	273	1,398	275
1998	265	943	209
1999	133	629	290
2000	442	742	908
2001	893	902	1,000
2002	1,328	1,031	1,034
2003	1,230	671	717
2004	3,110	870	472
2005	936	626	352
2001-2005 Average	**1,499**	**820**	**715**

Washington populations in the Lower Columbia DPS have generally increased in recent years, compared to the poor returns in the 1990's. During the poor abundance years of 1995-1999, average returns to individual basins ranged between 60 and 620 wild winter steelhead with an overall index abundance estimated at 2,000 fish. Returns to individual streams in recent years (2001-2005) have an average range of 90 to 1,575 fish, with an overall index abundance of 4,600 wild winter steelhead. On average, abundance trends during 2001-2005 are 40% to nearly twice that observed in the previous 5-year span between 1996 and 2000 (Table 5).

The reported abundance for 2005 totals over 3,600 wild winter steelhead. Although this count is 20% less than that of the recent five-year average (2000-2004) of 4,600 fish, the 2005 abundance is nearly twice that (174%) of the 1990's average abundance, and comparable to the high survival years of the late 1980's.

Table 5. Abundance Of Wild Winter Steelhead In Washington Index Areas Within The Lower Columbia River DPS (Ellis 2006).

Year	Coweeman	SF Toutle	NF Toutle	Green Index[1]	Kalama	EF Lewis Index[2]	Cedar Creek	Washougal
Escapement Goal	**1,064**	**1,058**	**--**	**--**	**1,000**	**204/ 1,243**	**328**	**520**
Recovery Plan Goal	**800**	**1,600**	**700**		**650**	**600**		**500**
1985	--	1,807	--	775	632	--	--	--
1986	--	1,595	--	--	919	282	--	--
1987	889	1,650	--	402	982	192	--	--
1988	1,088	2,222	--	310	1,079	258	--	--
1989	392	1,371	18	128	506	140	--	--
1990	522	752	36	86	356	102	--	--
1991	--	904	108	108	959	72	--	114
1992	--	1,290	322	44	1,974	88	--	142
1993	438	1,242	165	84	843	90	--	118
1994	362	632	90	128	725	78	--	158
1995	68	396	175	174	1,030	53	--	206
1996	44	150	251	108	725	--	70	--
1997	108	388	183	132	456	192	78	92
1998	486	374	149	118	413	420	38	195
1999	198	562	133	72	478	476	52	294
2000	530	490	238	124	817	--	73	--
2001	384	348	185	192	922	328	41	216
2002	298	858	328	180	1,355	316	88	286
2003	460	1,510	410	438	1,699	624	237	764
2004	722	1,212	249	256	2,150	1,298	44	1,114
2005	370	520	166	222	1,751	246	38	320
2001-2005 Average	447	890	268	258	1,575	562	90	540

[1] Green River is an index count through 2004, total count thereafter. No escapement goal defined.

[2] EF Lewis goal is an index goal (204) through 1995, and a total goal (1,243) thereafter.

Escapement goals have been developed for several Washington tributaries. Escapement and recovery goals are shown in Table 5. These escapement goals were based on the rearing capacity of the stream measured by the summer low flow capacity (Gibbons et al 1985). Recovery goals are from the Lower Columbia Salmon Recovery And Fish & Wildlife Subbasin Plan (LCFRB 2004).

The status of Lower Columbia River steelhead was reviewed in a report that updated the status of listed salmon and steelhead species (Good et. al. 2005). Summary statistics on population trends and growth rate from the BRT report are presented in Table 6 and Table 7. The majority of populations have a long-term (based on 14-25 years ending in 2001, 2002 and 2003) trend less than one, indicating the population is in decline. In addition, there is a high probability for most populations that the true trend/growth rate is less than one (Table 7). Short-term trends are also generally less than 1.0 for most populations. Short-term trend analysis includes information over the last 12 or 13 years. The potential reasons for these declines have been cataloged in the WLC-TRT status reviews and include habitat degradation, deleterious hatchery practices, and climate-driven changes in marine survival (BRT 2003).

2.2.1.2 Middle Columbia River Steelhead DPS

The Middle Columbia River Steelhead DPS includes steelhead populations in Oregon and Washington drainages upstream of the Hood and Wind River systems to and including the Yakima River. The Snake River is not included in this DPS.

The abundance of natural-origin populations in the Middle Columbia River steelhead DPS has increased substantially over the past 5 years. The Deschutes and Upper John Day Rivers have recent 5-year mean abundance levels in excess of their respective interim recovery target abundance levels (Lohn 2002). Due to an uncertain proportion of out-of-DPS strays in the Deschutes River, the recent increases in this population are difficult to interpret. The Umatilla River recent 5-year mean natural-origin population abundance is approximately 72 percent of its interim recovery target abundance level (Good et. al. 2005). The natural-origin populations in the Yakima River, Klickitat River, Touchet River, Walla Walla River, and Fifteenmile Creek, however, remain well below their interim recovery target abundance levels (BRT 2003). Long-term trends for 11 of the 12 production areas in the DPS were negative, although it was observed that these downward trends are driven, at least in part, by a peak in returns in the middle to late 1980s, followed by relatively low escapement levels in the early 1990s (BRT 2003). Short-term trends in the 12 production areas were mostly positive from 1990 to 2001 (BRT 2003). The continued low number of natural-origin returns to the Yakima River (10 percent of the interim recovery target abundance level, historically a major production center for the DPS) generated concern among the BRT. However, anadromous and resident *O. mykiss* remain well distributed in the majority of subbasins in the Middle Columbia River DPS. The presence of substantial numbers of out-of-basin (and largely out-of-DPS) natural-origin spawners in the Deschutes River, raised substantial concern regarding the genetic integrity and productivity of the native Deschutes population. The extent to which this straying is an historical natural phenomenon is unknown. The cool Deschutes River temperatures may attract fish migrating in the comparatively warmer Columbia River waters, thus inducing high stray rates.

Table 6. Trend and growth rate for subset of Lower Columbia winter steelhead populations. 95% confidence intervals are in parentheses. The long-term analysis used the entire data set (see table B.2.4.2 in the BRT report for years). The criteria for the short-term data set is defined in the methods section. In the "Hatchery = 0" columns, the hatchery fish are assumed to have zero reproductive success. In the "Hatchery = Wild" columns, hatchery fish are assumed to have the same relative reproductive success as natural-origin fish (BRT 2003).

Population	Long-Term Analysis			Short-Term Analysis		
	Trend (C.I.)	Lamda (C.I.)		Trend (C.I.)	Lambda (C.I.)	
		Hatchery = 0	Hatchery =Wild		Hatchery = 0	Hatchery =Wild
Coweeman River	0.916 (0.847-0.990)	0.908 (0.792-1.041)	0.742 (0.678-0.903)	0.941 (0.818-1.083)	0.920 (0.803-1.055)	0.787 (0.682-0.909)
South Fork Toutle River	0.917 (0.876-0.961)	0.938 (0.830-1.059)	0.933 (0.821-1.061)	0.94 (0.879-1.006)	0.933 (0.826-1.054)	0.929 (0.817-1.056)
North Fork Toutle River	1.135 (1.038-1.242)	1.062 (0915-1.233)	1.062 (0.915-1.233)	1.086 (0.999-1.18)	1.038 (0.894-1.206)	1.038 (0.894-1.206)
Kalama River	0.998 (0.973-1.023)	1.10 (0.913-1.117)	0.916 (0.824-1.019)	1.004 (0.923-1.091)	0.984 (0.890-1.088)	0.922 (0.829-1.025)
Clackamas River	0.979 (0.966-0.933)	0.971 (0.901-1.047)	0.949 (0.877-1.027)	0.914 (0.806-1.036)	0.875 (0.812-0.943)	0.830 (0.767-0.898)
Sandy River	0.940 (0.919-0.960)	0.945 (0.85-1.051)	0.828 (0.741-0.925)	0.889 (0.835-0.946)	0.866 (0.797-0.985)	0.782 (0.700-0.874)

Table 7. Probability the trend or growth rate is less than one. In the "Hatchery = 0" columns, the hatchery fish are assumed to have zero reproductive success. In the "Hatchery = Wild" columns, hatchery fish are assumed to have the same relative reproductive success as natural-origin fish (BRT 2003).

Population	Long-Term Analysis			Short-Term Analysis		
	Trend	Lamda		Trend	Lambda	
		Hatchery = 0	Hatchery =Wild		Hatchery = 0	Hatchery =Wild
Coweeman River	0.985	0.936	1.000	0.822	0.851	0.995
South Fork Toutle River	0.999	0.884	0.899	0.919	0.797	0.812
North Fork Toutle River	0.005	0.063	0.063	0.026	0.135	0.135
Kalama River	0.574	0.405	0.971	0.463	0.593	0.846
Clackamas River	0.998	0.784	0.918	0.929	0.849	0.929
Sandy River	1.000	0.993	1.000	0.999	0.991	1.000

The BRT noted the particular difficulty in evaluating the contribution of resident fish to DPS-level extinction risk. Several sources indicate that resident fish are very common in the DPS and may greatly outnumber anadromous fish. The BRT concluded that the relatively abundant and widely distributed resident fish in the DPS reduce risks to overall DPS abundance, but provide an uncertain contribution to DPS productivity, spatial structure, and diversity (BRT 2003b; BRT 2004a).

Current hatchery programs may provide a slight benefit to DPS abundance. Artificial propagation increases total DPS abundance, principally in the Umatilla and Deschutes Rivers. The kelt reconditioning efforts in the Yakima River do not augment natural-origin abundance, but do benefit the survival of the natural-origin populations. The Touchet River hatchery program has only recently been established, and its contribution to DPS viability is uncertain. The contribution of DPS hatchery programs to the productivity of the three target populations, and the DPS in-total, is uncertain. The hatchery programs affect a small proportion of the DPS, providing a negligible contribution to DPS spatial structure. Overall the impacts to DPS diversity are neutral. The Umatilla River program, through the incorporation of natural-origin broodstock, likely limits adverse effects to population diversity. The Deschutes River hatchery program may be decreasing population diversity. The recently initiated Touchet River endemic program is attempting to reduce adverse effects to diversity through the elimination of out-of-DPS Lyons Ferry Hatchery steelhead stock. Collectively, artificial propagation programs in the DPS provide a slight beneficial effect to DPS abundance, but have neutral or uncertain effects on DPS productivity, spatial structure, and diversity.

2.2.1.3 Upper Willamette River Steelhead DPS

The Upper Willamette River steelhead DPS includes five populations, all of which are winter populations. An analysis was conducted by Steel and Sheer (2002) to assess the number of stream kilometers (km) historically and currently available to steelhead populations in the Upper Willamette River (Table 8). Stream km usable by salmon are determined based on simple gradient cut offs, and on the presence of impassable barriers. This approach will over estimate the number of usable stream km as it does not take into consideration habitat quality (other than gradient); however, the analysis does indicate that for all populations the number of stream km currently accessible is reduced significantly from the historical condition.

Escapement information is available for all Upper Willamette River steelhead DPS populations, except for West Side Tributaries. The recent trend in wild winter steelhead abundance was in decline during the 1990's, followed by increases beginning in 2000 (Table 9). Information is also available for the DPS as a whole by evaluating passage information over Willamette Falls. The Willamette Falls data set contains information on wild winter steelhead counts from 1993 and represents the total escapement of wild winter steelhead for the Upper Willamette DPS. Counts at Willamette Falls increased by a factor of three in 2001 compared to earlier years.

Table 8. Historical populations of Upper Willamette River steelhead and loss of habitat from barriers[1] (Steel and Sheer (2002).

	Potential Current Habitat (km)	Potential Historical Habitat (km)	Current to Historical Habitat Ratio (%)
Molalla River	521	827	63
North Santiam River	210	347	61
South Santiam River	581	856	68
Calapooia	203	318	64
West Side Tributaries	1376	2053	67

Molalla River

The Molalla River currently contains three distinct runs of steelhead: native late-run winter steelhead, introduced early-run winter steelhead (from Lower Columbia River populations), and introduced Skamania summer-run steelhead (Chilcote 1997). Releases of the early-run steelhead into the Molalla were discontinued in the mid-1990s (Chilcote 1997). An abundance time series for natural-origin winter steelhead in the Molalla River shows a declining trend in the mid 1990s, and an increasing trend since 1997 (Table 9). The 2001-05 average is 1,865, which compares to a recent high of 2,485 in 2002, and it is comparable to returns in the late 1990s.

North Santiam River

Native late-winter and introduced Skamania summer-run steelhead are both present in the North Santiam River (Chilcote 1997). Surveys done in 1940 estimated that the run of steelhead at the time was at least 2,000 fish (Parkhurst et al. 1950). Parkhurst et al. (1950) also reported that larger runs of steelhead existed in Breitenbush, Little North Santiam, and Marion Fork Rivers, which are tributaries of the North Santiam River. Native steelhead were artificially propagated at the North Santiam Hatchery beginning in 1930, when a record 2,860,500 eggs (686 females @ 4170 eggs/female) were taken (Wallis 1963). The release of hatchery propagated steelhead (late-winter run) in the North Santiam was discontinued in 1998. Recent (through 1994) average escapements to the North Santiam have averaged 1,800 fish of mixed hatchery and natural-origin (Busby et al. 1996). An abundance time series based on redd counts data from the North Santiam River show a declining trend from 1984-1995, and a stable, slightly increasing tend from 1996-2004. The estimated return for 2005 is the second lowest return since 1984 (Table 9).

South Santiam River

Index areas for the South Santiam River population are divided into the Lower and Upper reaches. Native late-winter and introduced Skamania summer-run steelhead are both present in the South Santiam River. An abundance time series based on dam counts from the Upper South Santiam River show a low, but stable trend from 1984-2000, and an increasing trend from 2001-2004. The estimated return in 2005 was intermediate (Table 9). An abundance time series based on redd counts from the Lower South Santiam River shows a declining trend from 1984-1997, and a stable, slightly increasing trend since 1998. The estimated return in 2005 was the third lowest since 1984 (Table 9).

Table 9. Estimated Spawner Abundance Of Wild Winter Steelhead In Selected Populations In The Upper Willamette River DPS.

Year	Willamette Falls	Molalla	North Santiam	Lower S. Santiam	Upper S. Santiam	Calapooia
1984		1,908			504	
1985		2,660	4,968	2,521	355	555
1986					326	
1987			3,225	1,853	214	481
1988		2,482	1743	1,790	656	439
1989		1,985	3,370	1,199	222	183
1990		1,691			272	
1991		1,398	2,455	1,853	139	309
1992		1,898	1,771	1,715	361	119
1993		577	2,306	929	256	39
1994		2,321	2,273	1,630	234	161
1995		898	1,252		297	109
1996	1,324	398			131	
1997	3,431	590	1,919	578	337	253
1998	2,179	1,411	1,970	616	359	358
1999	4,414	1,090	2,025		328	
2000	4,315	1,898	2,414		326	225
2001	11,792	1,654	3,375	2,485	783	446
2002	16,039	2,485[2]	3,227	1,274	1,002	351
2003	8,681	1,730[2]	4,013	1,175	850	458
2004	11,433	2,010[2]	3,863	2,531	1,015	684
2005	5,927	1,445[2]	1,650	891	628	140
2001-2005 Average	10,774	1,865	3,226	1,671	856	416

1/ Tributary counts based on spawning ground surveys in years when counts were conducted.
2/ Recent abundances in the Molalla are estimates.

Calapooia River

An abundance time series based on redd counts data from the Calapooia River show a declining trend from 1984-1997, and an increasing trend since 1998. The estimated return in 2005 was the fourth lowest since 1984 (Table 9).

West Side Tributaries
No time series or current counts of spawner abundance for the West Side Tributaries population are available. It is questionable if there was ever a self-sustaining steelhead population on the west side. There is assumed to be little, if any, natural production of steelhead in these tributaries.

Willamette Falls Counts
Counts of natural-origin winter steelhead at Willamette Falls represent the total escapement for the Upper Willamette DPS. Natural-origin winter steelhead counts at Willamette falls averaged 3,100 fish between 1996 and 2000 (range 1,324 - 4,414), and 12,144 fish between 2001 and 2003 (range 8,681 - 16,039) (Table 9). The return of Upper Willamette steelhead in 2005 was 5,927 (Table 9).

2.3 Factors Affecting the Environmental Baseline

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

Many of the biological requirements for listed DPSs in the action area can best be expressed in terms of essential habitat features. That is, the DPS requires adequate: (1) substrate (especially spawning gravel), (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) migration conditions (February 16, 2000, 65 FR 7764). The best scientific information presently available demonstrates that a multitude of factors, past and present, have contributed to the decline of west coast salmonids by adversely affecting these essential habitat features. NMFS reviewed much of that information in its reinitiated Consultation on Operation of the Federal Columbia River Power System (FCRPS) (NMFS 2000b). Information describing the environmental baseline is summarized in the following sections. NMFS again reviewed and summarized the environmental baseline in its more recent consultation on the FCRPS (NMFS 2004)

2.3.1 The Hydropower System and Flood Control Dams

Hydropower development on the Columbia River and its tributaries has dramatically affected anadromous salmonids in the basin. Dams have eliminated spawning and rearing habitat and altered the natural hydrograph of the Columbia River – decreasing spring and summer flows and increasing fall and winter flows. Power operations cause flow levels and river elevations to fluctuate – slowing fish movement through reservoirs, altering riparian ecology, and stranding fish in shallow areas. The dams in the migration corridors kill smolts and adults and alter their

migrations. The dams have also converted the once-swift river into a series of slow-moving reservoirs – slowing the smolts' journey to the ocean and creating habitat for predators.

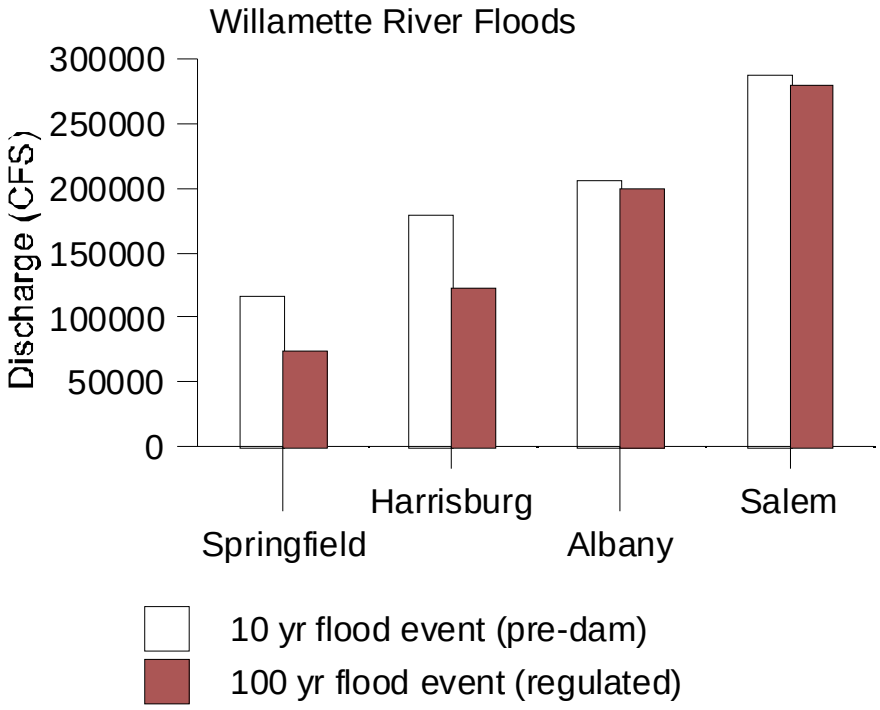
Of the affected DPSs, only three of the LCR winter steelhead populations and two MCR winter steelhead populations must navigate past major hydroelectric projects during their up- and downstream migrations. Because of these migrations and the fact that all the populations experience the effects of other dam operations occurring upstream from their DPS boundary, all three DPSs are subject to all the impacts described above. For more information on the effects of the mainstem hydropower system, please see NMFS (2004).

For the UWR winter steelhead populations, the construction and operation of the Federal flood control dams in the Willamette Basin has significantly influenced the status of listed species and their habitat. From 1952 to 1968, the Corps constructed 13 dams on all of the major east side tributary streams to the Willamette River above the Falls, blocking over 400 miles of stream habitat previously accessible to spring Chinook salmon and winter steelhead (ODFW and WDFW 1999). Most of the dams do not have fish passage or the facilities are inadequate for unimpeded passage upstream and downstream.

In addition to the elimination of the majority of anadromous fish habitat, the operation of the dams has significantly affected the life history, distribution, and survival of the remaining natural-origin populations of winter steelhead. The occurrence and magnitude of floods events has been significantly altered in the Willamette Basin (Figure 1). This change has implications to nutrient input, stream habitat dynamics, and the survival of juvenile fish. Current flow regimes in the Willamette Basin are counter to the natural regimes observed historically. Winter and spring water releases from the dams are warmer and of lower discharge, which has accelerated egg development and fish emerge earlier than what occurred historically. Summer flows are higher and cooler than historically. In the fall, flows are relatively high because the dams are being drawn down in preparation for the next year's winter run-off into the reservoirs.

However, ongoing biological opinions from NMFS to the Bonneville Power Administration (BPA), the U.S. Army Corps of Engineers (USACE), the USFWS, and the Bureau of Reclamation (BOR) have brought about numerous beneficial changes in the operation and configuration of the Willamette River hydropower system. For example, increased spill at the dams allows smolts to avoid both turbine intakes and bypass systems; increased flow in the mainstem Willamette and Columbia Rivers provides better inriver conditions for smolts; and better smolt transportation, through the addition and modification of barges in the Columbia River.

Figure 1. Comparison of the magnitude and frequency of floods before dam development and under current dam regulation at four locations on the mainstem Willamette River. Floods events that, on average, recurred every ten years during pre-dam development, now occur a low magnitude every 100 years (Data from Benner and Sedell 1997)



2.3.2 Human Induced Habitat Degradation

The quality and quantity of freshwater habitat in much of the Columbia River Basin, including the Willamette sub-basin, have declined dramatically in the last 150 years. Forestry, farming, grazing, road construction, hydropower development, mining, and urban development have radically changed the historical habitat conditions of the basin. With the exception of fall Chinook salmon, which generally spawn and rear in the mainstem rivers, salmon and steelhead spawning and rearing habitat is found in the tributaries to the Columbia and Willamette Rivers.

A major player in salmonid habitat degradation, urban development in the Willamette Valley followed agriculture which was also damaging. Ninety-six percent of Oregon's population resided in Portland in the 1850s. By the 1930's there were twenty-one incorporated cities in the valley, and by the 1990's, there were over 70 incorporated cities (Hulse 1998). In the Metro region, there are an estimated total of 8,840 structures in or close to the floodplain, and approximately 1,080 household units were built in or close to the floodplain between 1992 and 1995. The Willamette floodplain has been dammed, diked, drained, filled, and confined to the point that it no longer functions as a healthy ecosystem with the capacity to support native fish

and wildlife, absorb and reduce the impact of flooding, and filter contaminants (Allen et. al, 1999). Tributary water quality problems contribute to poor water quality when sediment and contaminants from the tributaries settle in mainstem reaches and the estuary.

Over 2,500 streams and river segments and lakes do not meet Federally-approved, state and Tribal water quality standards and are now listed as water-quality-limited under Section 303(d) of the Clean Water Act (CWA). Most of the water bodies in Oregon and Washington on the 303(d) list do not meet water quality standards for temperature. High water temperatures adversely affect salmonid metabolism, growth rate, and disease resistance, as well as the timing of adult migrations, fry emergence, and smoltification. Many factors can cause high stream temperatures, but they are primarily related to land-use practices rather than point-source discharges. Some common actions that cause high stream temperatures are the removal of trees or shrubs that directly shade streams, water withdrawals for irrigation or other purposes, and warm irrigation return flows. Loss of wetlands and increases in groundwater withdrawals contribute to lower base-stream flows, which in turn contribute to temperature increases. Activities that create shallower streams (e.g., channel widening) also cause temperature increases.

Pollutants also degrade water quality. Many waterways in the Willamette River Basin fail to meet the CWA and Safe Drinking Water Act (SDWA) water quality standards due to the presence of pesticides, heavy metals, dioxins and other pollutants (Willamette River Basin Task Force 1997). These pollutants originate from both point sources (industrial and municipal waste) and nonpoint sources (agriculture, forestry, urban activities, etc.). The types and amounts of compounds found in runoff are often correlated with land use patterns (e.g. fertilizers and pesticides are found frequently in agricultural and urban settings, and nutrients are found in areas with human and animal waste). People contribute to chemical pollution in the basin, but natural and seasonal factors also influence pollution levels in various ways.

Nutrient and pesticide concentrations vary considerably from season to season, as well as among regions with different geographic and hydrological conditions. Natural features (such as geology and soils) and land-management practices (such as storm water drains, tile drainage and irrigation) can influence the movement of chemicals over both land and water (Allen et al. 1999). Salmon require clean gravel for successful spawning, egg incubation, and the emergence of fry. Fine sediments clog the spaces between gravel and restrict the flow of oxygen-rich water to the incubating eggs. Excess nutrients, low levels of dissolved oxygen, heavy metals, and changes in pH also directly affect the water quality for salmon and steelhead.

Water quantity problems are also a significant cause of habitat degradation and reduced fish production. Millions of acres of land in the basins are irrigated. Although some of the water withdrawn from streams eventually returns as agricultural runoff or groundwater recharge, crops consume a large proportion of it. Withdrawals affect seasonal flow patterns by removing water from streams in the summer (mostly May through September) and restoring it to surface streams and groundwater in ways that are difficult to measure. Withdrawing water for irrigation, urban consumption, and other uses increases temperatures, smolt travel time, and sedimentation. Return water from irrigated fields can introduce nutrients and pesticides into streams and rivers.

Deficiencies in water quantity have impacted the McKenzie, mainstem Willamette, and Lower Columbia Rivers, all of which have experienced major agricultural development over the last century. Water withdrawals (primarily for irrigation) have lowered summer flows in nearly every stream in the basin and profoundly decreased the amount and quality of rearing habitat (Allen et al. 1999). In fact, in 1993, fish and wildlife agency, Tribal, and conservation group experts estimated that 80 percent of 153 Oregon tributaries had low-flow problems with two-thirds caused, at least in part, by irrigation withdrawals (OWRD 1993). The Northwest Power Planning Council (NWPPC) showed similar problems in many Oregon and Washington tributaries (NWPPC 1992).

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

On the landscape scale, human activities have affected the timing and amount of peak water runoff from rain and snowmelt. Forest and range management practices have changed vegetation types and density which, in turn, affect runoff timing and duration. Many riparian areas, flood plains, and wetlands that once stored water during periods of high runoff have been destroyed by development that paves over or compacts soil—thus increasing runoff and altering their natural hydrograph pattern. Land ownership has also played its part in the region's habitat and land-use changes. Federal lands, which compose 50 percent of the Willamette basin, are generally forested and are situated in the upstream portions of the watersheds. While there is substantial habitat degradation across all land ownership types, in general, habitat quality in many headwater stream sections is in better condition than in the largely non-Federal lower portions of tributaries (Doppelt et al. 1993, Frissell 1993, Henjum et al. 1994, Quigley and Arbelbide 1997). In the past, valley bottoms were among the most productive fish habitats in the basin (Stanford and Ward 1992, Spence et al. 1996, Independent Science Group (ISG) 1996). Today agricultural and urban land development and water withdrawals have significantly altered the habitat for fish and wildlife. Streams in these areas typically have high water temperatures, sedimentation problems, low flows, simplified stream channels, and reduced riparian vegetation.

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

The Columbia River estuary, through which all the basin's anadromous species must pass, has also been changed by human activities. Historically, the downstream half of the estuary was a dynamic environment with multiple channels, extensive wetlands, sandbars, and shallow areas. The mouth of the Columbia River was about four miles wide, today it is two. Winter and spring floods, low flows in late summer, large woody debris floating downstream, and a shallow bar at the mouth of the Columbia River kept the environment dynamic. Today navigation channels have been dredged, deepened, and maintained. Jetties and pile-dike fields have been constructed to stabilize and concentrate flow in navigation channels. Marsh and riparian habitats have been filled and diked, and causeways have been constructed across waterways. These actions have decreased the width of the mouth of the Columbia River to two miles and increased the depth of the Columbia River channel at the bar from less than 20 to more than 55 feet.

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

Human-caused habitat alterations have also increased the number of predators feeding on listed fish. A population of terns on Rice Island (16,000 birds in 1997) consumed an estimated 6 to 25 million outmigrating salmonid smolts during 1997 (Roby et al.1998) and 7 to 15 million outmigrating smolts during 1998 (Collis et al. 1999). Rice Island is a dredged material disposal site in the Columbia River estuary, created by the USACE under its Columbia River Channel Operation and Maintenance Program.

As another example, populations of Northern pikeminnow (Ptychocheilus oregonensis—a voracious salmonid predator) in the Columbia River have proliferated in the warm, slow-moving reservoirs created by mainstem dams. Some researchers have estimated the pikeminnow population in the John Day pool alone to be over one million (Bevan et al. 1994) and they all consume salmonids if given the opportunity.

To counteract all the ill effects listed in this section, Federal, state, tribal, and private entities have, singly and in partnership, begun recovery efforts to help slow and, eventually, reverse the decline of salmon and steelhead populations. Notable efforts within the range of the DPSs under this biological opinion are the Basinwide Recovery Strategy (Federal Caucus 2000), the Northwest Forest Plan (NFP), PACFISH, the Washington Wild Stock Restoration Initiative, the Oregon Plan for Salmon and Watersheds (OPSW), and the Washington Wild Salmonid Policy. Nevertheless, much remains to be done to recover salmonids in the Columbia River basin. Full discussions of these efforts can be found in the referenced documents and in the FCRPS biological opinions.

2.3.3 Hatcheries

For more than 100 years, hatcheries in the Pacific Northwest have been used to (a) produce fish for harvest and (b) replace natural production lost to dam construction and other development—not to protect and rebuild naturally-produced salmonid populations. As a result, most salmonid populations in the region are primarily derived from hatchery fish. In 1987, for example, 95 percent of the coho salmon, 70 percent of the spring Chinook salmon, 80 percent of the summer Chinook salmon, 50 percent of the fall Chinook salmon, and 70 percent of the steelhead returning to the Columbia River Basin, including the Lower Columbia River and Willamette sub-basins, originated in hatcheries (CBFWA 1990). Hatchery percentage estimates, proportions of hatchery fish relative to total run size, by sub-basin are: UWR steelhead are 24% in the Molalla, 17% in the North Santiam, 5% to 12% in the South Santiam, and less than 5% in the Calapooia (Chilcote 1997, 1998), LCR steelhead are 92% in the Cowlitz River, and 77% in the Kalama River, 50% in the North Fork Washougal River, 0% in the mainstem Washougal River, and 0% to 1% in the North Fork Toutle and Wind rivers (NMFS 2000a).

Because hatcheries have traditionally focused on providing fish for harvest and replacing declines in native runs (and generally not carefully examined their own effects on local populations), it is only recently that the substantial effects of hatcheries on native naturally produced populations been demonstrated. For example, the production of hatchery fish, among other factors, has contributed to the 90 percent reduction in naturally produced coho salmon runs in the Lower Columbia River over the past 30 years (Flagg et al. 1995).

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

In many areas, hatchery fish provide increased fishing opportunities. However, when naturally produced fish mix with hatchery stocks in these areas, smaller or weaker naturally produced stocks can be over harvested. Moreover, when migrating adult hatchery and naturally produced fish mix on the spawning grounds, the health of the naturally produced runs and the habitat's ability to support them can be overestimated because the hatchery fish mask the surveyors' ability to discern naturally produced run conditions.

The role hatcheries play in the Columbia basin is being redefined by NOAA Fisheries' proposed hatchery listing policy, developing environmental impact statements, and recovery planning efforts. These efforts will focus on maintaining and improving DPS viability. Research designed to clarify interactions between natural and hatchery fish and quantify the effects of artificial propagation on natural fish will play a pivotal role in informing these efforts. The final facet of

these initiatives is to use hatcheries to create fishing opportunities that are benign to listed populations (e.g., terminal area fisheries).

2.3.4 Harvest

Steelhead have been harvested in the Columbia basin and Willamette sub-basin as long as there have been people there. Commercial fishing developed rapidly with the arrival of European settlers and the advent of canning technologies in the late 1800s. The development of non-Treaty fisheries began in about 1830; by 1861, commercial fishing was an important economic activity. The early commercial fisheries used gill nets, seines hauled from shore, traps, and fish wheels. Later, purse seines and trolling (using hook and line) fisheries developed. Recreational (sport fishing) harvest began in the late 1800s, occurring primarily in tributary locations (ODFW and WDFW 1998). Though steelhead and chum salmon were never as important a component of the Columbia basin's fisheries as Chinook salmon, net-based fisheries generally do not discriminate among species, so it can fairly be said that harvest has also contributed to the decline of all salmonid DPSs.

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

For years, the response to declining catches was hatchery construction to produce more fish. Because hatcheries require fewer adults to sustain their production, harvest rates in the fisheries were allowed to remain high or even increase, further exacerbating the effects of overfishing on the naturally-produced (non-hatchery) runs mixed in the same fisheries. More recently, harvest managers have instituted reforms including weak stock, abundance-based, harvest rate, and escapement-goal management. As with improvements being made in other phases of the life histories, it will take some time for these (and future) measures to contribute greatly to the species recovery, but the effort has begun.

<u>Columbia River Basin Harvest</u>
There is some harvest of listed steelhead that occurs within the action area, but outside the mainstem Columbia River which is the focus of the proposed action. This includes tributary recreational fisheries that are being considered separately under section 4(d) of the ESA.

No commercial fishing is allowed in the tributary areas. Catch-and-release of all unmarked steelhead is required in recreational fisheries. Some mortality occurs associated with catch-and-

release of natural-origin steelhead. Mortality rates are population specific since these on effort and encounter rates in each tributary area. Additional mortality associated with these recreational fisheries is on the order of 2% or less.

2.3.5 Natural Conditions

Natural changes in freshwater environments play a major role in salmonid abundance. Steelhead are exposed to high rates of natural predation, particularly during freshwater rearing and migration stages. In general, salmonids are prey for pelagic fishes, birds, and marine mammals, including harbor seals, sea lions, and killer whales. There have been recent concerns that the rebound of seal and sea lion populations—following their protection under the Marine Mammal Protection Act of 1972—has caused a substantial number of salmonid deaths. In recent years, for example, sea lions have learned to target Upper Willamette River spring Chinook salmon in the fish ladder at Willamette Falls.

2.3.6 Scientific Research

ESA-listed and other fish in the Lower Columbia River basin and Willamette River sub-basin are the subject of scientific research and monitoring activities. Most biological opinions NMFS issues recommend specific monitoring, evaluation, and research projects to gather information to aid the survival of listed fish. In addition, NMFS has issued numerous research permits authorizing takes of ESA-listed fish over the last few years. Each authorization for take by itself would not lead to decline of the species. However the sum of the authorized takes indicate a high level of research effort in the action area, and as anadromous fish stocks have continued to decline, the proportion of fish handled for research/monitoring purposes has increased. The effect of these activities is difficult to assess because despite the fact that fish are harassed and even killed in the course of scientific research, these activities have a great potential to benefit ESA-listed salmon and steelhead. For example, aside from simply increasing what is known about the listed species and their biological requirements, research is essentially the only way to answer key questions associated with difficult resource issues that crop up in every management arena and involve every salmonid life history stage (particularly the resource issues discussed in the previous sections). Perhaps most importantly, the information gained during research and monitoring activities can help resource managers recover listed species. That is, no rational resource allocation or management decisions can be made without the knowledge to back them up. Further, there is no way to tell if the corrective measures described in the previous sections are working unless they are monitored and no way to design new and better ones if research is not done.

In any case, scientific research and monitoring efforts (unlike the other factors described in the previous sections) are not considered to be a factor contributing to the decline of listed salmonids, and NMFS believes that the information derived from the research activities is essential to their survival and recovery. Nonetheless, fish are harmed during research activities. And activities that are carried out in a careless or undirected fashion are not likely to benefit the species at all. Therefore, to reduce adverse effects from research activities on the species, NMFS imposes conditions in its permits so that Permit Holders conduct their activities in such a way as to minimize adverse effects on the ESA-listed species, including keeping mortalities as low as

possible. Also, researchers are encouraged to use non-listed fish species and hatchery fish instead of listed naturally-produced fish when possible. In addition, researchers are required to share fish samples, as well as the results of the scientific research, with other researchers and co-managers in the region as a way to avoid duplicative research efforts and to acquire as much information as possible from the ESA-listed fish sampled. NMFS also works with other agencies to coordinate research and thereby prevent duplication of effort.

In general, for projects that require a section 10(a)(1)(A) permit, applicants provide NMFS with high take estimates to compensate for potential inseason changes in research protocols, accidental catastrophic events, and the annual variability in listed fish numbers. Also, most research projects depend on annual funding and the availability of other resources. So, a specific research project for which take of ESA-listed species is authorized by a permit may be suspended in a year when funding or resources are not available. As a result, the overall take in a given year for all research projects, as provided to NMFS in post-season annual reports, is usually less than the authorized level of take in the permits and the related NMFS biological opinion on the issuance of those permits. Therefore, because actual take levels tend to be lower than authorized takes, the severity of effects to the ESA-listed species due to the conduct of scientific research activities are usually less than the effects analyzed in a typical biological opinion.

2.3.7 Summary

In conclusion, the picture of whether biological requirements are being met is more clear-cut for habitat related parameters than it is for population factors. Given all the factors for decline—even taking into account the conservation measures being implemented—it is still clear that the biological requirements for Upper Willamette River, Lower Columbia River steelhead, and Middle Columbia River steelhead DPSs are currently not being met under the environmental baseline. Their status is such that there must be a significant improvement in the environmental conditions of the species' respective habitats (over those currently available under the environmental baselines). Any further degradation of the environmental conditions would have a significant impact due to the amount of risk the species presently face under the environmental baselines. In addition, there must be improvements to minimize impacts due to dams, incidental harvest, hatchery practices, and unfavorable estuarine and marine conditions

3. EFFECTS OF THE ACTION

3.1 Evaluating the Effects of the Action

3.1.1 Applying ESA Section 7(a)(2) Standards

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

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

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

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

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

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

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

3.2 Effects on Habitat

Previous sections have described the habitat of the affected ESA listed steelhead DPSs in the Columbia River, the essential features of that habitat, and depicted its present condition. The discussion here focuses on how those features are likely to be affected by the proposed action.

While harvest activities do affect passage in that fish are intercepted, those impacts are accounted for explicitly in the following analyses regarding harvest related mortality. Most of the harvest related activities occur from boats. Gears that are used include primarily drift nets (gillnets and tanglenet), which do not substantially affect the habitat. There will be no disturbance to vegetation, and negligible harm to spawning or rearing habitat, or to water quantity and water quality. Thus, there will be minimal effects on the essential habitat features of the affected species from the actions discussed in this supplemental biological opinion, certainly not enough to contribute to a decline in the values of the habitat.

3.3 Effects on ESA listed Steelhead DPSs

Fisheries may affect steelhead DPSs in several ways which have bearing on the likelihood of continued survival of the species. Some fish are caught and killed immediately during the course of the fishery. However, this fishery is designed for live capture to allow for the selective release of all steelhead and natural-origin Chinook.

Nonetheless, some fish released alive subsequently die. All harvest-related mortality is estimated and accounted for. The proposed 2% mortality rate therefore refers to a total mortality rate for all the proposed fisheries.

The key question to address in the consultation is whether the proposed action, managing the fishery subject to a 2% harvest mortality limit in 2006 and 2007, is likely to jeopardize the continued existence of the affected DPSs. However, several additional issues came up during prior consultations that relate to how the fishery can best be managed to minimize uncertainty and stay within the prescribed mortality limit. During past consultations the states provided additional information related to:

1) Differential run timing of the winter steelhead populations and the potential that populations would be subject to different mortality rates;
2) Methods for forecasting run size, both preseason and inseason;
3) The statistical design for monitoring and evaluating fishery mortality rates;
4) What additional impacts may occur to winter steelhead in Tribal fisheries above Bonneville Dam in Zone 6, and;
5) The degree to which summer run steelhead contribute to the catch and thereby reduce the estimated mortality to winter steelhead populations.

Of these, the first question related to differential run timing was most problematic and the subject of considerable scrutiny during prior consultations. A key assumption of the management system is that all winter steelhead populations are equally vulnerable to the fisheries so that all would be subject to the same harvest mortality. There is some evidence that certain populations have earlier run timing and would thus be past the mainstem fishing area during the peak of the fishery. If that is true, the remaining populations would be subject to a mortality rate that was potentially significantly higher than the proposed 2% mortality rate limit. Evidence related to the question of differential run timing was discussed in some detail in the 2005 Supplemental Biological Opinion (NMFS 2005a). No new run-timing information is available and the conclusion that fisheries can be managed to maintain relative equal level of impact to all the winter run steelhead populations reached during the 2005 consultation remain valid for 2006 and 2007. Nonetheless, new information related to run timing differences and how they may affect population-specific harvest rate would be useful.

3.3.1 Effects of the Proposed Action

<u>Considerations Related to a 2% Mortality Rate</u>

The states propose to manage fisheries with a mortality rate limit of winter steelhead of 2% in 2006 and 2007. The states have indicated that the proposed 2% mortality rate is needed to implement their harvest objectives which includes the implementation of mark-selective fisheries designed to reduce impacts on wild spring Chinook stocks. For spring Chinook the transition to selective fishing has been successful in maintaining harvest opportunity in both the recreational and commercial fisheries with much reduced impacts to wild spring Chinook. For example, inriver harvest rates on listed Upper Willamette spring Chinook have been reduced from 40% - 50% to less than 10% in recent years with

less than half the impacts occurring in the commercial fishery. Impacts to listed upriver spring Chinook are limited to a maximum of 2%. However, the transition to a selective fishery that requires the use of small mesh tanglenets has resulted in the increased handle of steelhead. Prior to the switch to tanglenets, impacts to steelhead were quite low because steelhead generally passed through the larger mesh gillnets used to target Chinook salmon. The states articulated that the use of tanglenets is motivated by their desire to maintain a fishery that has been redesigned successfully to reduce impacts to wild spring Chinook.

Regardless of the need and related justification, it is still necessary to determine whether the effect of the proposed fishery is or is not likely to jeopardize the affected steelhead DPSs. The recent ESA listing review reaffirmed that the status of the affected steelhead DPSs was still depressed and proposed to maintain the listing status of Upper Willamette River, Lower Columbia River, and Middle Columbia River steelhead as threatened (69 FR 33102, June 14, 2004). The Biological Review Team reviewed and documented the record of decline for winter steelhead populations (Good et. al. 2005). As discussed above the environmental baseline for steelhead in these DPSs is generally degraded.

However, it is apparent that the abundance of winter steelhead has increased over the last three to five years prior to 2005. This recent level of increase varies among populations, but the increase is spread broadly and evident for virtually every available winter steelhead population or abundance indicator. On average, abundance prior to 2005 was 134% higher in the last four years (2000-2003) compared to the previous four years (1996-1999) for these indicators (see Table 6 and Table 7). It is also pertinent to note that the available data is reasonably comprehensive representing most of the winter steelhead populations in the three DPSs. Abundance data is available for all of the populations in the Upper Willamette River DPS, and 11 of 14 populations in the Lower Columbia River DPS. Most of the larger populations in the Lower Columbia River DPS are represented by the abundance indicators including 70% of the total potential current habitat in the DPS (from Table 3). There are two winter steelhead populations in the Middle Columbia River DPS. Although information is limited, what is available for Fifteenmile Creek and the Klickitat River also suggests a comparable upward trend prior to 2005. When the states proposed to increase the allowable harvest rate to 6% in 2005, they relied largely on recent increases in abundance for justification. However, abundance for all populations of the Lower Columbia River and Upper Willamette River steelhead DPSs declined in 2005 relative to the recent 2001-2004 average.

Escapement goals are useful as benchmarks for comparison to current estimates of abundance. Different types of escapement goals are available for most of the Lower Columbia River winter steelhead populations. The states have management related escapement goals for several of the populations. These escapement goals presumably relate to some estimate of desired abundance level, but context for these goals is not defined. Two additional abundance goals were identified through the recent subbasin planning process (LCSRB 2004). The higher goal referred to as PFC represents the theoretical capacity if currently accessible habitat was restored to "proper functioning conditions." The "high" escapement goal is consistent with a viable state for the

population. Of the eight Lower Columbia River indicator stocks on the Washington side, five have been above one or more of the escapement benchmarks prior to 2005; some by a substantial margin (Table 7). Other populations are generally below the specified goals despite increases prior to 2005. In 2005, only two of the eight Lower Columbia River indicator stocks on the Washington side (Kalama and Washougal Rivers) were above Recovery Plan Goals and PFC goals.

There are no comparable goals for the Upper Willamette River steelhead populations. Returns to three of the five Upper Willamette populations (Molalla, North Santiam, and South Santiam) have been 2,000 fish or more in recent years prior to 2005, which is generally greater than the goals identified for the Lower Columbia River DPS populations and certainly high enough to mitigate against immediate risks. The smallest system in the DPS is Calapooia, where returns have been several hundred in recent years prior to 2005. In 2005 however, all five population exhibited a significant decrease. Returns in 2005 for all five populations were comparable to the returns before the recent observed increase.

Counts at Willamette Falls are a good index for the total return to the DPS since all returning winter-run steelhead destined to the Upper Willamette River DPS must pass above the Falls. In recent years prior to 2005, returns have been three to four times what they were prior to 2001 (Table 9). However, in 2005, winter-run steelhead counts at Willamette Falls were 5,927, which is slightly higher than counts in 1999 and 2000 (4,414 and 4,415, respectively), but still almost twice as much as the 1996-2000 average of 3,134.

The 2006 forecast for the total listed winter-run steelhead is 16,000, which is slightly higher than the actual return of 14,700 in 2005.

4. CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local or private actions not involving Federal activities that are reasonably certain to occur within the action area subject to this consultation. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act. State, Tribal and local government actions will likely to be in the form of legislation, administrative rules or policy initiatives. Government and private actions may include changes in land and water uses, including ownership and intensity, any of which could impact listed species or their habitat. Government actions are subject to political, legislative and fiscal uncertainties. These realities, added to the geographic scope of the action area which encompasses numerous government entities exercising various authorities and the many private land holdings, make any analysis of cumulative effects difficult and speculative. This section identifies representative actions that, based on currently available information, are reasonably certain to occur. It also identifies some goals, objectives and proposed plans by government entities; however, NMFS is unable to determine at this time whether any proposals will result in specific actions.

4.1 Representative State Actions

Each state in the Columbia River basin administers the allocation of water resources within its borders. Most streams in the basin are over–appropriated even though water resource development has slowed in recent years. Washington closed the mainstem Columbia River to new water withdrawals, and is funding a program to lease or buy water rights. If carried out over the long term this might improve water quantity. State and local governments are cooperating with each other and Federal agencies to increase environmental protections, including better habitat restoration, hatchery and harvest reforms. NMFS also cooperates with the state water resource management agencies in assessing water resource needs in the Columbia River basin, and in developing flow requirements that will benefit listed fish. During years of low water, however, there could be insufficient flow to meet the needs of the fish. These government efforts could be discontinued or even reduced, so their cumulative effects on listed fish is unpredictable. Most future actions in Oregon are described in the Oregon Plan for Salmon and Watershed (OPSW).

Along with significant harvest and hatchery measures, the OPSW includes the following habitat-related programs designed to benefit salmon and watershed health:

• Oregon Department of Agriculture Water Quality Management plans
• Oregon Department of Environmental Quality Total Maximum Daily (pollutant) Loads (TMDLs) in targeted basins.
• Oregon Watershed Enhancement Board funding programs for watershed enhancement programs, land and water acquisitions.
• ODFW and Oregon Water Resources Department programs to enhance flow restoration.

If these programs are actually implemented, there may be some improvement in various habitat features considered important for the listed species. The Oregon Plan also identifies several private and public cooperative programs for improving the environment for listed species. The success of such programs will depend on continued interest and cooperation among the parties involved.

The state of Washington has various strategies and programs designed to improve the habitat for listed species and assist in recovery planning. One such is the Salmon Recovery Planning Act—a framework for developing watershed restoration projects. The state is also developing a water quality improvement scheme through the development of TMDLs. As with the Oregon initiatives, these programs could benefit the listed species if implemented and sustained.
The Washington state government is cooperating with other governments to increase environmental protection for listed DPSs, including better habitat restoration, hatchery and harvest reforms, and water resource management. The following is a list of many of Washington's major efforts to protect and restore salmonids and their habitat:

• Washington Wildlife and Recreation Program
• Wild Stock Restoration Initiative
• Joint Wild Salmonid Policy

• Governor's Salmon Recovery Office
• Conservation Commission
• Salmon Recovery Lead Entities
• Salmon Recovery Funding Board

In the past, each state's economy was heavily dependent on natural resources, with intense resource extraction activity. Changes in the states' economies have occurred in the last decade and are likely to continue with less large scale resource extraction, more targeted extraction methods, and significant growth in other economic sectors. Growth in new businesses is creating urbanization pressures with increased demands for buildable land, electricity, water supplies, waste disposal sites and other infrastructure.

Economic diversification has contributed to population growth and movement in the states, a trend likely to continue for the next few decades. Such population trends will place greater demands in the action area for electricity, water and buildable land; affect water quality directly and indirectly; and increase the need for transportation, communication and other infrastructure development. The impacts associated with economic and population demands will affect habitat features, such as water quality and quantity, which are important to the survival and recovery of the listed species. The overall effect is likely to be negative, unless carefully planned for and mitigated.

Some of the state programs described above are designed to address these impacts. Oregon has a statewide land use planning program with growth management and natural resource protection goals. Washington enacted a Growth Management Act to help communities plan for growth and address growth impacts on the natural environment. If the programs continue they may help lessen some of the potential adverse effects identified above.

4.2 Local Actions

Local governments will be faced with similar but more direct pressures from population growth and movement. There will be demands for intensified development in rural areas as well as increased demands for water, municipal infrastructure and other resources. The reaction of local governments to such pressures is difficult to assess at this time without certainty in policy and funding. In the past local governments in the action area generally accommodated additional growth in ways that adversely affected listed fish habitat. Also, there is little consistency among local governments in dealing with land use and environmental issues so that any positive effects from local government actions on listed species and their habitat are likely to be scattered throughout the action area.

In both Oregon and Washington local governments are considering ordinances to address aquatic and fish habitat health impacts from different land uses. These programs are part of state planning structures; however, local governments in Oregon are likely to be cautious about implementing new programs because of the passage of a takings constitutional amendment. Some local government programs, if submitted, may qualify for a limit under the NMFS' ESA section 4(d) rule which is designed to conserve listed species. Local governments also may participate in regional watershed health programs,

although political will and funding will determine participation and therefore the effect of such actions on listed species. Overall, without comprehensive and cohesive beneficial programs and the sustained application of such programs, it is likely that local actions will not have measurable positive effects on listed species and their habitat, but may even contribute to further degradation.

4.3 Tribal Actions

Tribal governments will continue to participate in cooperative efforts involving watershed and basin planning designed to improve fish habitat. The results from changes in Tribal forest and agriculture practices, in water resource allocations, and in changes to land uses are difficult to assess for the same reasons discussed under State and Local Actions. The earlier discussions related to growth impacts apply also to Tribal government actions. Tribal governments will need to apply comprehensive and beneficial natural resource programs to areas under their jurisdiction to produce measurable positive effects for listed species and their habitat.

4.4 Private Actions

The effects of private actions are the most uncertain. Private landowners may convert current use of their lands, or they may intensify or diminish current uses. Individual landowners may voluntarily initiate actions to improve environmental conditions, or they may abandon or resist any improvement efforts. Their actions may be compelled by new laws, or may result from population growth and economic pressures. Changes in ownership patterns will have unknown impacts. Whether any of these private actions will occur is highly unpredictable, and the effects even more so.

4.5 Summary

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

5. INTEGRATION AND SYNTHESIS OF EFFECTS

NMFS has again reviewed information related to the biological requirements, status, and environmental baseline for the Upper Willamette River, Lower Columbia River, and Middle Columbia River steelhead DPSs with particular emphasis on winter steelhead populations. It is apparent that steelhead from these DPSs have gone through a long period of decline to the point where their listing under the ESA was warranted. The proposed incidental take cap of 2% is related the states’ desire to continue with

implementation and development of a selective tanglenet fishery directed at unlisted, hatchery-origin spring Chinook. The development of selective fishing technologies has allowed the states to maintain a commercial fishery with low impacts to wild spring Chinook. However, as a consequence of using the small mesh tanglenets that allows for live capture and release of Chinook, more steelhead are handled in the fishery. Steelhead are thus a potential constraint to the Chinook fishery under certain circumstances.

It is difficult to evaluate the effects of the proposed fisheries on individual steelhead DPSs. The proposed fisheries considered in this supplemental opinion affects almost exclusively winter-run populations of the Lower Columbia River, Middle Columbia River, and Upper Willamette River steelhead DPSs. Estimates of mortality rate for winter steelhead (as a total) can be used as a surrogate for mortality rates to individual steelhead DPSs resulting from the implementation of these fisheries, if we assume that impacts are proportionally distributed amongst winter-run stocks of all three affected steelhead DPSs. This approach is conservative for the Middle Columbia River steelhead DPS, and to some extent for the Lower Columbia River DPS sine these DPSs also include summer-run populations. Impacts on affected steelhead DPSs with summer-run stocks will be considerably less than for the Upper Willamette River DPS which contains only winter-run steelhead stocks.

If there are significant run timing differences between winter steelhead populations of these three DPSs, some populations may be subject to higher harvest mortality than others. After reviewing the available information in 2005, NMFS concluded that it is unlikely that particular populations or run components will be subject to significant disproportionate impacts (NMFS 2005). More information is clearly needed related to migration timing, but NMFS concurs that it is reasonable to assume, based on available information and the structure of the fisheries, that winter steelhead populations are not likely to be subject to significant differences in harvest mortality as a result of the proposed fisheries. There is no new information regarding run-timing at this time, thus this assumption and conclusion remains for 2006 and 2007. NMFS expects that the states will continue to collect information relative to run timing of ESA listed winter steelhead population. If the current conclusion changes based on new information, NMFS expects that appropriate measures be implemented to deal with this potential problem as necessary.

The management guidelines introduced in 2003, including the requirement for a yearly wild winter steelhead runsize forecast, and a cap for allowable handle of steelhead each year, have proved effective in regulating fisheries inseason since 2003. The mortality rate for wild winter steelhead in the 2003, 2004 and 2005 tangle net fishery are estimated to be 1.02%, 0.91% and 0.54% of the river mouth wild winter steelhead runsize estimate, respectively (Ellis 2006). Despite an increase in the allowable take limit for listed winter steelhead in 2005, the states were able to manage fisheries under a 2% cap. It is evident that the management guidelines introduced in 2003 are very effective in ensuring that yearly incidental take limits are not exceeded. The states have indicated their desire to continue to manage the selective commercial tangle net spring Chinook fishery inside the allowable take limit of 2% for 2006 and 2007. The management guidelines that are in

effect provide reasonable assurance that allowable take of 2% for listed wild winter steelhead will not be exceeded in 2006 and 2007. By managing fisheries with a mortality rate limit for wild winter steelhead of 2% or less, the impacts on wild summer steelhead will be considerably less than 2% for all the affected steelhead DPSs.

6. CONCLUSION

The proposal considered in this consultation is to manage non-Treaty fisheries in the Columbia River below the Dalles Dam subject to a 2% harvest mortality limit on listed winter-run steelhead. But conclusions related to jeopardy for a proposed action pertain to the DPSs and not a subset of the populations. Two of the three DPSs considered in this consultation also include summer run populations. Upper Willamette River steelhead all have winter-run timing. The Lower Columbia River DPS is composed primarily of winter run populations (fourteen of twenty extant populations have winter-run timing). Only two of the Middle Columbia River populations have winter-run timing.

The proposed harvest rate limit of 2% for the affected steelhead DPSs has been in effect since they became listed in 1998 and 1999. During this time, the abundance of winter steelhead populations for the three DPSs have had periods of substantial increase and periods when abundance has been relative stable, suggesting that a harvest rate limit of 2% is at least consistent with a potential for increase in abundance for the affected populations. The proposed harvest rate limit of 2% is also consistent with the Lower Columbia Salmon Recovery And Fish and Wildlife Subbasin Plan.

The status and other information related to the summer run populations from these DPSs were not reviewed in this consultation since the states' proposal would not change the level of impact considered in the 2005 opinion for the Interim Management Agreement (NMFS 2005c). Populations with summer run timing will also be subject to a 2% harvest mortality limit. The focus of the analysis is on winter steelhead; the conclusion pertains to the affected DPSs.

After reviewing the current status of the listed DPSs considered in this supplemental opinion, the environmental baseline for the action area, the effects of the proposed fisheries and associated management guidelines, and cumulative effects, it is NMFS' biological opinion that the proposed fisheries for 2006 and 2007 are not likely to jeopardize the continued existence of the Lower Columbia River, Middle Columbia River, or Upper Willamette River steelhead DPSs.

The essential habitat features for the three DPSs considered in this biological opinion are not substantially affected by the proposed fisheries. The proposed fisheries will therefore not result in the destruction or adverse modification of any of the essential habitat features for Upper Willamette River, Lower Columbia River, or Middle Columbia River steelhead.

7. INCIDENTAL TAKE STATEMENT

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

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

The ITS from the 2005 biological opinion is incorporated by reference in this supplemental biological opinion to provide a complete record of the applicable provisions. Elements of the ITS related to the steelhead DPSs, and winter populations in particular, are added in this supplemental biological opinion. The ITS in this consultation relate only to winter steelhead populations for 2006 and 2007. The full text of the ITS for all other salmon Evolutionarily Significant Units and steelhead DPSs can be found in the 2005 biological opinion on the Interim Management Agreement (NMFS 2005).

7.1 Amount or Extent of the Take

NMFS anticipates that listed winter steelhead will be taken as a result of non-Treaty fisheries in 2006 and 2006 managed by the terms of the 2005-07 Interim Management Agreement. The incidental take is expected to be in the form of catch and retention, or mortalities resulting from catch and release, or mortalities resulting from encounter with fishing gear, as a consequence of fishery activities. The amount of take is described in terms of a mortality rate or the percent of the total listed winter steelhead run taken by non-Treaty fisheries. The harvest rate limit for the aggregate of winter-run populations returning to Lower Columbia River, Upper Willamette River, and Middle Columbia River steelhead DPSs is 2%.

The expected impacts are based on the pre-season run size projection by the TAC. The actual number of listed fish which can be incidentally harvested will change accordingly each year. It is the applicable harvest rate limits, and not a static number of listed fish, that defines the limit of mortality in these fisheries. A post-season report, based on catch and the observed run size, will also be provided by TAC. Inseason monitoring will occur to ensure that fishery-specific impacts, applied to inseason updates of the run-size projection whenever possible, do not deviate substantially from expectation.

7.2 Reasonable and Prudent Measures

The NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize the take of winter steelhead listed under the ESA.

It is essential that inseason management actions taken during the course of the fisheries be consistent with the management objectives described in TAC's supplemental biological assessment (Ellis 2006). In order to implement these measures, it is necessary to monitor both run size and catch during the season. To assure conformity with the specified harvest rate limit of 2%, and to provide information necessary for monitoring performance, NMFS shall oversee implementation of the following Reasonable and Prudent Measures by the specified parties to the 2005-2007 U.S. v. Oregon Interim Management Agreement.

1. ODFW and WDFW shall manage their fisheries to minimize harvest impacts to listed winter steelhead.

2. Parties to the Interim Agreement shall provide preseason information necessary to manage fisheries as proposed.

3. Parties to the Interim Agreement shall monitor winter steelhead runs inseason, and TAC shall provide updates to run size projections as appropriate.

4. ODFW and WDFW shall monitor the catch for all commercial and recreational fisheries.

7.3 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, NMFS must comply with the following terms and conditions, which implement the reasonable and prudent measures, described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary. NMFS shall oversee implementation of the following Terms and Conditions by the specified parties to the 2005-2007 U.S. v. Oregon Interim Management Agreement.

1a. ODFW and WDFW shall manage their commercial spring Chinook fishery to keep harvest rates within the above described limits, based on TAC's preseason projections of run size and any subsequent inseason updates.

1b. the non-Treaty commercial spring Chinook tangle-net selective fishery shall be managed using a harvest rate cap for winter steelhead that is less than 2% to allow for anticipated recreational fishery impacts and provide a buffer for management uncertainty.

1c. large mesh nets (9-inch minimum mesh) may be used to minimize the encounter rate for steelhead. Alternatively, tangle nets with a maximum mesh size of 4 1/4-inch mesh shall be used to minimize the mortality rate associated with steelhead encounters. Voluntary use of steelhead excluders by the commercial fishers shall be encouraged.

1d. in 2003, TAC recommended using a 30% long-term mortality rate for 8-inch mesh and an 18.5% rate for the 4 1/4 inch mesh for winter steelhead in the non-Treaty commercial spring Chinook tangle-net selective fishery. TAC shall review any other available information to modify the mortality estimates if necessary for use in 2007 and beyond.

1e. Use of recovery boxes, short soak times, and reduced net length are mandatory.

2a. the parties to the Interim Agreement are responsible for providing preseason forecasts of run size necessary to manage the proposed fisheries as proposed. These shall be provided annually to NMFS by the TAC by December 15 of each year, for fisheries starting on January 1st the following year.

2b. ODFW and WDFW shall also report annually the expected total mortality rate in state fisheries for listed winter steelhead. The report shall be provided to NMFS by December 15 of each year and will be used by NMFS to assess continued compliance with the proposed action.

3a. Parties to the Interim Agreement shall monitor available information to develop inseason updates to run size estimates for listed winter steelhead. All revisions to preseason information shall be report to NMFS by TAC as they become available. The inseason information is necessary to ensure continued compliance with the proposed action.

3b. Maximum allowable mortality rates used to plan fisheries shall be based on a percentage of this preseason runsize estimate as applicable.

3c. In 2006 and 2007, estimates of impacts on wild winter steelhead in the non-Treaty commercial spring Chinook tangle-net selective fishery will be based on the preseason run size information, the assumption that all of the steelhead caught through March are winter-run fish, and that 0.4% of the unmarked steelhead are hatchery-origin fish. These estimates may be updated based on new information, but similar procedures shall be used for estimating harvest impacts.

4a. Monitoring of catch in all fisheries by ODFW and WDFW shall be sufficient to provide statistically valid estimates of listed winter steelhead mortality. Sampling of the commercial catch shall include daily contact with buyers regarding the catch of the previous day. The recreational fishery shall be sampled using effort surveys and suitable measures of catch rate. The monitors shall be on-board the commercial boats and collect a variety of data, including numbers of steelhead and spring Chinook handled, mark rate, condition at capture, and condition at release.

4b. Results from the catch monitoring shall be reported to NMFS by TAC periodically as necessary to ensure that the catch remains within the prescribed harvest rate limits. Periodically may mean weekly or more often during active fishing periods. Data are summarized the day following each fishing period and reported to the fishery managers and the TAC.

4c. The TAC shall account for the catch of each fishery as it occurs through the season. If it becomes apparent inseason that any of the established harvest rate limits may be exceeded due to catch or revisions in the run-size projection, then the states shall take additional management measures to reduce the anticipated catch as needed to conform to the limits.

NMFS believes that incidental take resulting from the proposed fisheries will be no greater than that described in section 7.1, above. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, or impacts are incurred disproportionately on any component of the aggregate winter steelhead return in a manner not considered here, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided, as described in section 9.0, below. In such a case, the agencies must immediately provide an explanation of the causes of the excess taking, and review with the NMFS the need for possible modification of the reasonable and prudent measures.

8. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary

measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop additional information. The following conservation recommendations are consistent with the above described obligations, and therefore should be implemented:

1. It would be useful to have a method for updating the expected return of natural-origin spring Chinook and steelhead inseason so that harvest can be more responsive to the strength of the run. NMFS therefore recommends that TAC explore the options for developing such a method.

2. There continues to be some uncertainty about impacts to winter steelhead resulting from implementation of the harvest mortality limit in 2006 and 2007. Prior the 2008 season, the states of Oregon and Washington should further analyze and describe the status of winter run populations and conduct a risk assessment that relates population size to varying levels of harvest mortality. This should include a consideration of the effects on weaker populations among the aggregate of winter run populations.

3. Prior to the 2008 season the states of Oregon and Washington should investigate the use of a sliding scale harvest rate schedule related to stock abundance and indicators of marine survival.

4. The assumption that winter run steelhead populations have similar run timing and are thus subject to similar mortality rates as a result of the fishery remains key. Additional information or research related to run timing should be considered prior the 2008 fishery.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, NMFS requests notification of the implementation of any conservation recommendations.

9. REINITIATION OF CONSULTATION

This concludes formal consultation on the proposed action, and it is thereby to be incorporated into the 2005-07 Interim Management Agreement. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take specified in the Incidental Take Statement is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect on to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, section 7 consultation must be immediately reinitiated.

10. MAGNUSON-STEVENS ACT ESSENTIAL FISH HABITAT CONSULTATION

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

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

An EFH consultation was conducted and is included in the 2005 biological opinion for the 2005-07 Interim Management Agreement (NMFS 2005c). An action agency must reinitiate the EFH consultation if plans for these actions are substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for the EFH conservation recommendations (50 CFR Section 600.920(k)). EFH is not designated for the listed steelhead DPSs considered in this supplemental biological opinion.

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