

## DEPARTMENT OF COMMERCE

## National Oceanic and Atmospheric Administration

## 50 CFR Part 227

[Docket No. 980225046-8046-01 ; I.D. No. 021098B]

RIN 0648-AK54

**Endangered Species: Proposed Threatened Status for Two ESUs of Steelhead in Washington and Oregon**

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Proposed rule; request for comments.

**SUMMARY:** NMFS has completed a comprehensive status review of West Coast steelhead (*Oncorhynchus mykiss*, or *O. mykiss*) populations in Washington and Oregon and has identified 15 Evolutionarily Significant Units (ESUs) within this range. NMFS is now issuing a proposed rule to list two steelhead ESUs as threatened under the Endangered Species Act (ESA). The proposed ESUs include the Middle Columbia River ESU located in Washington and Oregon, and the Upper Willamette River ESU located in Oregon.

In both ESUs, only naturally spawned steelhead are proposed for listing. Prior to the final listing determination, NMFS will examine the relationship between hatchery and naturally spawned populations of steelhead in these ESUs and assess whether any hatchery populations are essential for the recovery of the naturally spawned populations. This may result in the inclusion of specific hatchery populations as part of a listed ESU in NMFS' final determination.

NMFS requests public comments on the issues pertaining to this proposed rule. NMFS also requests suggestions and comments on integrated local/state/tribal/Federal conservation measures that will achieve the purposes of the ESA to recover the health of steelhead populations and the ecosystems upon which they depend. NMFS strongly supports current efforts by the states of Oregon and Washington to develop effective and scientifically based conservation measures to address at-risk salmon and steelhead stocks. NMFS believes these efforts, if successful, could serve as the central components of a broad conservation program that would provide a steady, predictable, and well grounded road to recovery and rebuilding of these stocks. NMFS

intends to work closely with these efforts and those of local and regional watershed groups, as well as other involved Federal agencies, and hopes that this proposal will add greater impetus to those efforts.

**DATES:** Comments must be received by June 8, 1998. NMFS will announce the dates and locations of public hearings in Washington and Oregon in a separate **Federal Register** notice. Requests for additional public hearings must be received by April 24, 1998.

**ADDRESSES:** Comments on this proposed rule should be sent to Chief, Protected Resources Division, NMFS, Northwest Region, 525 NE Oregon Street, Suite 500, Portland, OR 97232-2737. Comments may not be submitted electronically.

**FOR FURTHER INFORMATION CONTACT:**

Garth Griffin, 503-231-2005, or Joe Blum, 301-713-1401. Requests for public hearings or reference materials should be sent to Jim Lynch via the Internet at jim.lynch@noaa.gov.

**SUPPLEMENTARY INFORMATION:****Background**

On May 20, 1993, NMFS announced its intent to conduct a status review to identify all coastal steelhead ESU(s) within California, Oregon, and Washington, and to determine whether any identified ESU(s) warranted listing under the ESA. Subsequently, on February 16, 1994, NMFS received a petition from the Oregon Natural Resources Council and 15 co-petitioners to list all steelhead (or specific ESUs, races, or stocks) within the states of California, Oregon, Washington, and Idaho. In response to this petition, NMFS announced the expansion of its status review to include inland steelhead populations occurring in eastern Washington and Oregon and the State of Idaho (59 FR 27527, May 27, 1994).

On August 9, 1996, NMFS published a proposed rule to list 10 ESUs of west coast steelhead as threatened and endangered under the ESA; NMFS solicited comments on the proposal (61 FR 41541). In this notice, NMFS concluded that the Middle Columbia River ESU warranted classification as a candidate species since NMFS was concerned about the status of steelhead in this area, but lacked sufficient information to merit a proposed listing. In this notice NMFS also concluded that the Upper Willamette River steelhead ESU did not warrant listing based on available scientific information.

On August 18, 1997, NMFS published a final rule listing five ESUs as threatened and endangered under the

ESA (62 FR 43937). In a separate notice published on the same day, NMFS determined substantial scientific disagreement remained for five proposed ESUs (62 FR 43974, August 18, 1997). In accordance with section 4(b)(6)(B)(i) of the ESA, NMFS deferred its decision on these remaining steelhead ESUs for six months, until February 9, 1998, for the purpose of soliciting additional data. By court order the deadline for these final determinations was extended to March 13, 1998.

During the 6-month period of deferral, NMFS received new scientific information concerning the status of the Upper Willamette River and Middle Columbia River ESUs. This new information was considered by NMFS' Biological Review Team, a team composed of staff from NMFS' Northwest Fisheries Science Center and Southwest Regional Office, as well as a representative of the U.S. Geological Survey Biological Resources Division (formerly the National Biological Service). NMFS has now completed an updated status review for steelhead that analyzes this new information [Memorandum to William Stelle and William Hogarth from M. Schiewe, December 18, 1997, Status of Deferred and Candidate ESUs of West Coast Steelhead]. Copies of this memorandum are available upon request (see **ADDRESSES**). Based on this updated review and other information, NMFS now proposes to list the Upper Willamette River and Middle Columbia River steelhead ESUs as threatened species under the ESA.

Given the complicated background of this proposed rule, it is important to understand how information is presented in this notice. First, we discuss the life history and ESA policies applicable to steelhead in general. Second, we describe NMFS' findings concerning the geographic extent of the Upper Willamette and Middle Columbia River ESUs. Third, we discuss the factors that have led to the decline of these two ESUs, as well as existing conservation efforts that may ameliorate risks to these species. Finally, we describe NMFS' conclusions regarding the status of these two ESUs, along with potential regulatory implications of a final listing.

**Steelhead Life History**

Steelhead exhibit one of the most complex suite of life history traits of any salmonid species. Steelhead may exhibit anadromy (meaning that they migrate as juveniles from fresh water to the ocean, and then return to spawn in fresh water) or freshwater residency (meaning that

they reside their entire lives in fresh water). Resident forms are usually referred to as "rainbow" or "redband" trout, while anadromous life forms are termed "steelhead". Few detailed studies have been conducted regarding the relationship between resident and anadromous *O. mykiss* and as a result, the relationship between these two life forms is poorly understood. Recently however, the scientific name for the biological species that includes both steelhead and rainbow trout was changed from *Salmo gairdneri* to *O. mykiss*. This change reflects the premise that all trouts from western North America share a common lineage with Pacific salmon.

Steelhead typically migrate to marine waters after spending 2 years in fresh water. They then reside in marine waters for typically 2 or 3 years prior to returning to their natal stream to spawn as 4- or 5-year-olds. Unlike Pacific salmon, steelhead are iteroparous, meaning that they are capable of spawning more than once before they die. However, it is rare for steelhead to spawn more than twice before dying; most that do so are females. Steelhead adults typically spawn between December and June (Bell 1990). Depending on water temperature, steelhead eggs may incubate in "redds" (nesting gravels) for 1.5 to 4 months before hatching as "alevins" (a larval life stage dependent on food stored in a yolk sac). Following yolk sac absorption, alevins emerge from the gravel as young juveniles or "fry" and begin actively feeding. Juveniles rear in fresh water from 1 to 4 years, then migrate to the ocean as "smolts".

Biologically, steelhead can be divided into two reproductive ecotypes, based on their state of sexual maturity at the time of river entry and the duration of their spawning migration. These two ecotypes are termed "stream maturing" and "ocean maturing." Stream maturing steelhead enter fresh water in a sexually immature condition and require several months to mature and spawn. Ocean maturing steelhead enter fresh water with well developed gonads and spawn shortly after river entry. These two reproductive ecotypes are more commonly referred to by their season of freshwater entry (e.g., summer- and winter-run steelhead, respectively).

Two major genetic groups or "subspecies" of steelhead occur on the west coast of the United States: a coastal group and an inland group, separated by the Fraser and Columbia River Basins by the Cascade crest approximately (Huzyk & Tsuyuki, 1974; Allendorf, 1975; Utter & Allendorf, 1977; Okazaki, 1984; Parkinson, 1984; Schreck et al., 1986;

Reisenbichler et al., 1992). Behnke (1992) proposed to classify the coastal subspecies as *O. m. irideus* and the inland subspecies as *O. m. gairdneri*. These genetic groupings apply to both anadromous and nonanadromous forms of *O. mykiss*. Both coastal and inland steelhead occur in Washington and Oregon. California is thought to have only coastal steelhead while Idaho has only inland steelhead.

Historically, steelhead were distributed throughout the North Pacific Ocean from the Kamchatka Peninsula in Asia to the northern Baja Peninsula. Presently, the species distribution extends from the Kamchatka Peninsula, east and south along the Pacific coast of North America, to at least as far as Malibu Creek in southern California. There are infrequent anecdotal reports of steelhead continuing to occur as far south as the Santa Margarita River in San Diego County (McEwan & Jackson 1996). Historically, steelhead likely inhabited most coastal streams in Washington, Oregon, and California as well as many inland streams in these states and Idaho. However, during this century, over 23 indigenous, naturally reproducing stocks of steelhead are believed to have been extirpated, and many more are thought to be in decline in numerous coastal and inland streams in Washington, Oregon, Idaho, and California. Forty-three stocks were identified by Nehlsen et al., 1991 as at moderate to high risk of extinction.

#### Consideration as a "Species" Under the ESA

To qualify for listing as a threatened or endangered species, the identified populations of steelhead must be considered "species" under the ESA. The ESA defines a *species* to include "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature". NMFS published a policy describing the agency's application of the ESA definition of "species" to anadromous Pacific salmonid species (56 FR 58612, November 20, 1991). NMFS's policy provides that a Pacific salmonid population will be considered distinct and, hence, a species under the ESA if it represents an ESU of the biological species. A population must satisfy two criteria to be considered an ESU: (1) It must be reproductively isolated from other conspecific population units, and (2) it must represent an important component in the evolutionary legacy of the biological species. The first criterion, reproductive isolation, need not be absolute, but must be strong enough to permit

evolutionarily important differences to accrue in different population units. The second criterion is met if the population contributes substantially to the ecological/genetic diversity of the species as a whole. Guidance on the application of this policy is contained in a NOAA Technical Memorandum "Definition of 'Species' Under the Endangered Species Act: Application to Pacific Salmon," that is available upon request (see ADDRESSES).

#### Reproductive Isolation

Genetic data provide useful indirect information on reproductive isolation because they integrate information about migration and gene flow over evolutionarily important time frames. During the status review, NMFS worked in cooperation with the States of California, Oregon, Idaho, and Washington to develop a genetic stock identification database for steelhead. Natural and hatchery steelhead were collected by NMFS, California Department of Fish and Game, Oregon Department of Fish and Wildlife (ODFW), Idaho Department of Fish and Game (IDFG), Washington Department of Fish and Wildlife (WDFW), and U.S. Fish and Wildlife Service (FWS) for protein electrophoretic analysis by NMFS and WDFW. Existing NMFS data for Columbia and Snake River Basin steelhead were also included in the database.

In addition to the new studies, published results from numerous studies of genetic characteristics of steelhead populations were considered. These included studies based on protein electrophoresis (Huzyk & Tsuyuki, 1974; Allendorf, 1975; Utter & Allendorf, 1977; Okazaki, 1984; Parkinson, 1984; Campton & Johnson, 1985; Milner & Teel, 1985; Schreck et al., 1986; Hershberger & Dole, 1987; Berg & Gall, 1988; Reisenbichler & Phelps, 1989; Reisenbichler et al., 1992; Currens & Schreck, 1993; Waples et al., 1993; Phelps et al., 1994; Leider et al., 1995). Supplementing these protein electrophoretic studies were two studies based on mitochondrial DNA (Buroker, unpublished; Nielsen 1994) and chromosomal karyotyping studies conducted by Thorgard (1977 and 1983) and Ostberg and Thorgard, 1994.

Genetic information obtained from allozyme, DNA, and chromosomal sampling indicate a strong differentiation between coastal and inland subspecies of steelhead. Several studies have identified coastal and inland forms of *O. mykiss* as distinct genetic life forms. Allendorf, 1975 first identified coastal and inland steelhead life forms in Washington, Oregon, and

Idaho based on large and consistent allele frequency differences that applied to both anadromous and resident *O. mykiss*. In the Columbia River, it was determined that the geographic boundary of these life forms occurs at or near the Cascade crest. Subsequent studies have supported this finding (Utter & Allendorf, 1977; Okazaki, 1984; Schreck et al., 1986; Reisenbichler et al., 1992). Recent genetic data from WDFW further supports the major differentiation between coastal and inland steelhead forms.

Few detailed studies have explored the relationship between resident and anadromous *O. mykiss* residing in the same location. Genetic studies generally show that, in the same geographic area, resident and anadromous life forms are more similar to each other than either is to the same form from a different geographic area. Recently, Leider et al., 1995 found that results from comparisons of rainbow trout in the Elwha and Cedar Rivers and Washington steelhead indicate that the two forms are not reproductively isolated. Further, Leider et al., 1995 also concluded that, based on preliminary analyses of data from the Yakima and Big White Salmon Rivers, resident trout would be genetically indistinguishable from steelhead. Based on these studies, it appears that resident and anadromous *O. mykiss* from the same geographic area may share a common gene pool, at least over evolutionary time periods.

On February 7, 1996, FWS and NMFS adopted a joint policy to clarify their interpretation of the phrase "distinct population segment (DPS) of any species of vertebrate fish or wildlife" for the purposes of listing, delisting, and reclassifying species under the ESA (61 FR 4722). DPSs are "species" pursuant to section 3(15) of the ESA. Previously, NMFS had developed a policy for stocks of Pacific salmon where an ESU of a biological species is considered "distinct" (and hence a species) if (1) it is substantially reproductively isolated from other conspecific population units, and (2) it represents an important component in the evolutionary legacy of the species (56 FR 58612, November 20, 1991). NMFS believes available data suggest that resident rainbow trout are in many cases part of steelhead ESUs. However, the FWS, which has ESA authority for resident fish, maintains that behavioral forms can be regarded as separate DPSs (e.g., western snowy plover) and that absent evidence suggesting resident rainbow trout need ESA protection, the FWS concludes that only the anadromous forms of each ESU should be listed under the ESA (DOI, 1997; FWS, 1997).

In response to earlier listing proposals, NMFS received numerous comments on the inclusion of summer and winter steelhead within the same steelhead ESUs. In addition to the comments received, additional genetic data has become available since the original status review. NMFS' assessment of this new information follows.

While NMFS considers both life history forms (summer and winter steelhead) to be important components of diversity within the species, new genetic data reinforces previous conclusions that within a geographic area, summer and winter steelhead typically are more genetically similar to one another than either is to populations with similar run timing in different geographic areas. This indicates that a conservation unit that included summer-run populations from different geographic areas but excluded winter-run populations (or vice-versa) would be an inappropriate unit. The only biologically meaningful way to have summer and winter steelhead populations in separate ESUs would be to have a very large number of ESUs, most consisting of just one or a very few populations. This would be inconsistent with the approach NMFS has taken in defining ESUs in other anadromous Pacific salmonids. Taking these factors into consideration, NMFS concludes that summer and winter steelhead should be considered part of the same ESU in geographic areas where they occur.

#### Summary of Proposed ESU Determinations

A summary of NMFS' ESU determinations for these species follows. A more detailed discussion of ESU determinations is presented in the "Status Review of West Coast Steelhead from Washington, Idaho, Oregon, and California" and "Status Review Update for Deferred and Candidate ESUs of West Coast Steelhead" (NMFS, 1996a; NMFS, 1997a). Copies of these documents are available upon request (see ADDRESSES).

##### (1) Upper Willamette River ESU

This coastal steelhead ESU occupies the Willamette River and its tributaries, upstream from Willamette Falls. The Willamette River Basin is zoogeographically complex. In addition to its connection to the Columbia River, the Willamette River historically has had connections with coastal basins through stream capture and headwater transfer events (Minckley et al., 1986).

Steelhead from the upper Willamette River are genetically distinct from those

in the lower river. Reproductive isolation from lower river populations may have been facilitated by Willamette Falls, which is known to be a migration barrier to some anadromous salmonids. For example, winter steelhead and spring chinook salmon (*O. tshawytscha*) occurred historically above the falls, but summer steelhead, fall chinook salmon, and coho salmon did not (Pacific Gas and Electric (PGE), 1994).

The native steelhead of this basin are late-migrating winter steelhead, entering fresh water primarily in March and April (Howell et al., 1985), whereas most other populations of west coast winter steelhead enter fresh water beginning in November or December. As early as 1885, fish ladders were constructed at Willamette Falls to aid the passage of anadromous fish. The ladders have been modified and rebuilt, most recently in 1971, as technology has improved (Bennett, 1987; PGE, 1994). These fishways facilitated successful introduction of Skamania stock summer steelhead and early-migrating Big Creek stock winter steelhead to the upper basin. Another effort to expand the steelhead production in the upper Willamette River was the stocking of native steelhead in tributaries not historically used by that species. Native steelhead primarily used tributaries on the east side of the basin, with cutthroat trout predominating in streams draining the west side of the basin.

Nonanadromous *O. mykiss* are known to occupy the Upper Willamette River Basin; however, most of these nonanadromous populations occur above natural and manmade barriers (Kostow, 1995). Historically, spawning by Upper Willamette River steelhead was concentrated in the North and Middle Santiam River Basins (Fulton, 1970). These areas are now largely blocked to fish passage by dams, and steelhead spawning is now distributed throughout more of the Upper Willamette River Basin than in the past (Fulton, 1970). Due to introductions of non-native steelhead stocks and transplantation of native stocks within the basin, it is difficult to formulate a clear picture of the present distribution of native Upper Willamette River steelhead, and their relationship to nonanadromous and possibly residualized *O. mykiss* within the basin.

##### (2) Middle Columbia River ESU

This inland steelhead ESU occupies the Columbia River Basin and tributaries from above (and excluding) the Wind River in Washington and the Hood River in Oregon, upstream to, and including, the Yakima River, in Washington. Steelhead of the Snake

River Basin are excluded. Franklin and Dyrness (1973) placed the Yakima River Basin in the Columbia Basin Physiographic Province, along with the Deschutes, John Day, Walla Walla, and lower Snake River Basins. Geology within this province is dominated by the Columbia River Basalt formation, stemming from lava deposition in the Miocene epoch, overlain by plio-Pleistocene deposits of glaciolacustrine origin (Franklin & Dyrness, 1973). This intermontane region includes some of the driest areas of the Pacific Northwest, generally receiving less than 40 cm of rainfall annually (Jackson, 1993). Vegetation is of the shrub-steppe province, reflecting the dry climate and harsh temperature extremes.

Genetic differences between inland and coastal steelhead are well established, although some uncertainty remains about the exact geographic boundaries of the two forms in the Columbia River. Electrophoretic and meristic data show consistent differences between steelhead from the middle Columbia and Snake Rivers. No recent genetic data exist for natural steelhead populations in the upper Columbia River, but recent WDFW data show that the Wells Hatchery stock from the upper Columbia River does not have a close genetic affinity to sampled populations from the middle Columbia River.

All steelhead in the Columbia River Basin upstream from The Dalles Dam are summer-run, inland steelhead (Schreck et al., 1986; Reisenbichler et al., 1992; Chapman et al., 1994). Steelhead in Fifteen Mile Creek, OR, are genetically allied with inland *O. mykiss*, but are winter-run. Winter steelhead are also found in the Klickitat and White Salmon Rivers, WA.

Life history information for steelhead of this ESU indicates that most middle Columbia River steelhead smolt at 2 years and spend 1 to 2 years in salt water (i.e., 1-ocean and 2-ocean fish, respectively) prior to re-entering fresh water, where they may remain up to a year prior to spawning (Howell et al., 1985; Bonneville Power Association (BPA), 1992). Within this ESU, the Klickitat River is unusual in that it produces both summer and winter steelhead, and the summer steelhead are dominated by 2-ocean steelhead, whereas most other rivers in this region produce about equal numbers of both 1- and 2-ocean steelhead.

#### Summary of Factors Affecting the Species

Section 4(a)(1) of the ESA and NMFS implementing regulations (50 CFR part 424) set forth procedures for listing

species. The Secretary of Commerce (Secretary) must determine, through the regulatory process, if a species is endangered or threatened based upon any one or a combination of the following factors: (1) The present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; or (5) other natural or human-made factors affecting its continued existence.

Several recent documents describe in more detail the impacts of various factors contributing to the decline of steelhead and other salmonids (e.g., NMFS, 1997b). Relative to west coast steelhead, NMFS has prepared a supporting document that addresses the factors leading to the decline of this species entitled "Factors for Decline: A supplement to the notice of determination for west coast steelhead" (NMFS, 1996b). This report, available upon request (see ADDRESSES), concludes that all of the factors identified in section 4(a)(1) of the ESA have played a role in the decline of the species. The report identifies destruction and modification of habitat, overutilization for recreational purposes, and natural and human-made factors as being the primary reasons for the decline of west coast steelhead. The following discussion briefly summarizes findings regarding factors for decline across the range of west coast steelhead.

#### A. The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

Steelhead on the west coast of the United States have experienced declines in abundance in the past several decades as a result of natural and human factors. Forestry, agriculture, mining, and urbanization have degraded, simplified, and fragmented habitat. Water diversions for agriculture, flood control, domestic, and hydropower purposes have greatly reduced or eliminated historically accessible habitat. Studies estimate that during the last 200 years, the lower 48 states have lost approximately 53 percent of all wetlands and the majority of the rest are severely degraded (Dahl, 1990; Tiner, 1991). Washington and Oregon's wetlands are estimated to have diminished by one-third, while California has experienced a 91 percent loss of its wetland habitat (Dahl, 1990; Jensen et al., 1990; Barbour et al., 1991; Reynolds et al., 1993). Loss of habitat complexity has also contributed to the decline of steelhead. For example, in

national forests in Washington, there has been a 58 percent reduction in large, deep pools due to sedimentation and loss of pool-forming structures such as boulders and large wood (Federal Ecosystem Management Assessment Team (FEMAT), 1993). Similarly, in Oregon, the abundance of large, deep pools on private coastal lands has decreased by as much as 80 percent (FEMAT, 1993). Sedimentation from land use activities is recognized as a primary cause of habitat degradation in the range of west coast steelhead.

#### B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Steelhead support an important recreational fishery throughout their range. During periods of decreased habitat availability (e.g., drought conditions or summer low flow when fish are concentrated), the impacts of recreational fishing on native anadromous stocks may be heightened. NMFS has reviewed and evaluated the impacts of recreational fishing on west coast steelhead populations (NMFS, 1996b). Steelhead are not generally targeted in commercial fisheries. High seas driftnet fisheries in the past may have contributed slightly to a decline of this species in local areas, but could not be solely responsible for the large declines in abundance observed along most of the Pacific coast over the past several decades.

A particular problem occurs in the main stem of the Columbia River where listed steelhead from the Middle Columbia River ESU are subject to the same fisheries as unlisted, hatchery-produced steelhead, chinook and coho salmon. Incidental harvest mortality in mixed-stock sport and commercial fisheries may exceed 30 percent of listed populations.

#### C. Disease or Predation

Infectious disease is one of many factors that can influence adult and juvenile steelhead survival. Steelhead are exposed to numerous bacterial, protozoan, viral, and parasitic organisms in spawning and rearing areas, hatcheries, migratory routes, and marine environments. Specific diseases such as bacterial kidney disease, ceratomyxosis, columnaris, Furunculosis, infectious hematopoietic necrosis, redmouth and black spot disease, Erythrocytic Inclusion Body Syndrome, and whirling disease among others are present and are known to affect steelhead and salmon (Rucker et al., 1953; Wood, 1979; Leek, 1987; Foott et al., 1994; Gould & Wedemeyer, undated). Very little current or

historical information exists to quantify changes in infection levels and mortality rates attributable to these diseases for steelhead. However, studies have shown that native fish tend to be less susceptible to pathogens than hatchery-reared fish (Buchanon et al., 1983; Sanders et al., 1992).

Introductions of non-native species and habitat modifications have resulted in increased predator populations in numerous river systems, thereby increasing the level of predation experienced by salmonids. Predation by marine mammals is also of concern in areas experiencing dwindling steelhead run sizes. NMFS recently published a report describing the impacts of California Sea Lions and Pacific Harbor Seals upon salmonids and on the coastal ecosystems of Washington, Oregon, and California (NMFS 1997c). This report concludes that in certain cases where pinniped populations co-occur with depressed salmonid populations, salmon populations may experience severe impacts due to predation. An example of such a situation is Ballard Locks, Washington, where sea lions are known to consume significant numbers of adult winter steelhead. This study further concludes that data regarding pinniped predation is quite limited, and that substantial additional research is needed to fully address this issue. Existing information on the seriously depressed status of many salmonid stocks is sufficient to warrant actions to remove pinnipeds in areas of co-occurrence where pinnipeds prey on depressed salmonid populations (NMFS, 1997c).

#### *D. Inadequacy of Existing Regulatory Mechanisms*

##### 1. Federal Land Management Practices

The Northwest Forest Plan (NFP) is a Federal management policy with important benefits for steelhead. While the NFP covers a very large area, the overall effectiveness of the NFP in conserving steelhead is limited by the extent of Federal lands and the fact that Federal land ownership is not uniformly distributed in watersheds within the affected ESUs. The extent and distribution of Federal lands limits the NFP's ability to achieve its aquatic habitat restoration objectives at watershed and river basin scales and highlights the importance of complementary salmon habitat conservation measures on non-Federal lands within the subject ESUs.

On February 25, 1995, the U.S. Forest Service and Bureau of Land Management adopted Implementation of Interim Strategies for Managing

Anadromous Fish-producing Watersheds in eastern Oregon and Washington, Idaho, and Portions of California (known as PACFISH). The strategy was developed in response to significant declines in naturally spawned salmonid stocks, including steelhead, and widespread degradation of anadromous fish habitat throughout public lands in Idaho, Washington, Oregon, and California outside the range of the northern spotted owl. Like the NFP, PACFISH is an attempt to provide a consistent approach for maintaining and restoring aquatic and riparian habitat conditions which, in turn, are expected to promote the sustained natural production of anadromous fish. However, as with the NFP, PACFISH is limited by the extent of Federal lands and the fact that Federal land ownership is not uniformly distributed in watersheds within the affected ESUs.

Interagency PACFISH implementation reports from 1995 and 1996 indicate PACFISH has not been consistently implemented and has not achieved the level of conservation anticipated for the short-term. Additionally, because PACFISH was expected to be replaced within 18 months, it required only minimal levels of watershed analysis and restoration. The interim PACFISH strategy will be effective until a long-term land management strategy is implemented. The Interior Columbia River Basin Ecosystem Management Project (ICBEMP) was intended to be in place by the end of the 18-month PACFISH period. Current projections indicate ICBEMP its implementation date will be delayed until late 1998 or 1999. In effect, PACFISH will have been in place 2.5 times longer than designed and its long-term limitations have already resulted in lost conservation opportunities for threatened and proposed anadromous fishes.

##### 2. State Land Management Practices

The Washington Department of Natural Resources implements and enforces the State of Washington's forest practice rules (WFPRs) that are promulgated through the Forest Practices Board. These WFPRs contain provisions that can be protective of steelhead if fully implemented. This is possible given that the WFPR's are based on adaptive management of forest lands through watershed analysis, development of site-specific land management prescriptions, and monitoring. Watershed Analysis prescriptions can exceed WFPR minima for stream and riparian protection. However, NMFS believes the WFPRs, including watershed analysis, do not provide properly functioning riparian

and instream habitats. Specifically, the base WFPRs do not adequately address large woody debris recruitment, tree retention to maintain stream bank integrity and channel networks within floodplains, and chronic and episodic inputs of coarse and fine sediment that maintain habitats that are properly functioning for all life stages of steelhead.

The Oregon Forest Practices Act (OFPA), while modified in 1995 and improved over the previous OFPA, does not have implementing rules that adequately protect salmonid habitat. In particular, the current OFPA does not provide adequate protection for the production and introduction of large woody debris (LWD) to medium, small and non-fish bearing streams. Small non-fish bearing streams are vitally important to the quality of downstream habitats. These streams carry water, sediment, nutrients, and LWD from upper portions of the watershed. The quality of downstream habitats is determined, in part, by the timing and amount of organic and inorganic materials provided by these small streams (Chamberlin et al. in Meehan, 1991). Given the existing depleted condition of most riparian forests on non-Federal lands, the time needed to attain mature forest conditions, the lack of adequate protection for non-riparian LWD sources in landslide-prone areas and small headwater streams (which account for about half the wood found naturally in stream channels) (Burnett and Reeves, 1997, citing Van Sickle and Gregory, 1990; McDade et al., 1990; and McCreary, 1994) and current rotation schedules (approximately 50 years), there is a low probability that adequate LWD recruitment could be achieved under the current requirements of the OFPA. Also, the OFPA does not adequately consider and manage timber harvest and road construction on sensitive, unstable slopes subject to mass wasting, nor does it address cumulative effects.

Agricultural activity has had multiple and often severe impacts on salmonid habitat. These include depletion of needed flows by irrigation withdrawals, blocking of fish passage by diversion or other structures, destruction of riparian vegetation and bank stability by grazing or cultivation practices, and channelization resulting in loss of side channel and wetland-related habitat (NMFS, 1996b).

Historically, the impacts to fish habitat from agricultural practices have not been closely regulated. The Oregon Department of Agriculture has recently completed guidance for development of agricultural water quality management

plans (AWQMPs) (as enacted by State Senate Bill 1010). Plans that are consistent with this guidance are likely to achieve state water quality standards. It is open to question, however, whether they will adequately address salmonid habitat factors, such as properly functioning riparian conditions. Their ability to address all relevant factors will depend on the manner in which they are implemented. AWQMPs are anticipated to be developed at a basin scale and will include regulatory authority and enforcement provisions. The Healthy Streams Partnership schedules adoption of AWQMPs for all impaired waters by 2001.

Washington also has not historically regulated impacts of agricultural activity on fish habitat overall, although there are some special requirements in the Puget Sound area, and Department of Ecology is currently giving close attention to impacts from dairy operations. As in Oregon, development of TMDLs should over the long term improve water quality; the extent to which other habitat impacts will be ameliorated is unknown.

### 3. Dredge, Fill, and Inwater Construction Programs

The Army Corps of Engineers (COE) regulates removal/fill activities under section 404 of the Clean Water Act (CWA), which requires that the COE not permit a discharge that would "cause or contribute to significant degradation of the waters of the United States". One of the factors that must be considered in this determination is cumulative effects. However, the COE guidelines do not specify a methodology for assessing cumulative impacts or how much weight to assign them in decision-making. Furthermore, the COE does not have in place any process to address the additive effects of the continued development of waterfront, riverine, coastal, and wetland properties.

### 4. Water Quality Programs

The CWA is intended to protect beneficial uses, including fishery resources. To date, implementation has not been effective in adequately protecting fishery resources, particularly with respect to non-point sources of pollution.

Section 303(d)(1)(C) and (D) of the CWA requires states to prepare Total Maximum Daily Loads (TMDLs) for all water bodies that do not meet state water quality standards. TMDLs are a method for quantitative assessment of environmental problems in a watershed and identifying pollution reductions needed to protect drinking water, aquatic life, recreation, and other use of

streams, rivers, lakes, and streams. TMDLs may address all pollution sources, including point sources such as sewage or industrial plant discharges, and non-point discharges such as runoff from roads, farm fields, and forests.

The CWA gives state governments the primary responsibility for establishing TMDLs. However, EPA is required to do so if a state does not meet this responsibility. State agencies in Oregon are committed to completing TMDLs for coastal drainages within four years, and all impaired waters within ten years. Similarly ambitious schedules are in place, or being developed for Washington and Idaho.

The ability of these TMDLs to protect steelhead should be significant in the long term; however, it will be difficult to develop them quickly in the short term and their efficacy in protecting steelhead habitat will be unknown for years to come.

### 5. Hatchery and Harvest Management

In an attempt to mitigate the loss of habitat, extensive hatchery programs have been implemented throughout the range of steelhead on the West Coast. While some of these programs have succeeded in providing fishing opportunities, the impacts of these programs on naturally spawned stocks are not well understood. Competition, genetic introgression, and disease transmission resulting from hatchery introductions may significantly reduce the production and survival of naturally spawned steelhead. Collection of native steelhead for hatchery broodstock purposes often harms small or dwindling natural populations. Artificial propagation can play an important role in steelhead recovery through carefully controlled supplementation programs.

Hatchery programs and harvest management have strongly influenced steelhead populations in the Lower and Middle Columbia River Basin ESUs. Hatchery programs intended to compensate for habitat losses have masked declines in natural stocks and have created unrealistic expectations for fisheries. Collection of natural steelhead for broodstock and transfers of stocks within and between ESUs has detrimentally impacted some populations.

The two state agencies (ODFW and WDFW) have adopted and are implementing natural salmonid policies designed to limit hatchery influences on natural, indigenous steelhead. Sport fisheries are based on marked, hatchery-produced steelhead and sport fishing regulations are designed to protect wild fish. While some limits have been

placed on hatchery production of anadromous salmonids, more careful management of current programs and scrutiny of proposed programs is necessary in order to minimize impacts on listed species.

### *E. Other Natural or Human-Made Factors Affecting its Continued Existence*

Natural climatic conditions have exacerbated the problems associated with degraded and altered riverine and estuarine habitats. Persistent drought conditions have reduced already limited spawning, rearing and migration habitat. Climatic conditions appear to have resulted in decreased ocean productivity which, during more productive periods, may help offset degraded freshwater habitat conditions (NMFS, 1996b).

### **Efforts Being Made to Protect West Coast Steelhead**

Section 4(b)(1)(A) of the ESA requires the Secretary of Commerce to make listing determinations solely on the basis of the best scientific and commercial data available and after taking into account efforts being made to protect the species. Therefore, in making its listing determinations, NMFS first assesses the status of the species and identifies factors that have led to the decline of the species. NMFS then assesses available conservation measures to determine if such measures ameliorate risks to the species.

In judging the efficacy of existing conservation efforts, NMFS considers the following: (1) The substantive, protective, and conservation elements of such efforts; (2) the degree of certainty such efforts will be reliably implemented; and (3) the presence of monitoring provisions that permit adaptive management (NMFS, 1996c). In some cases, conservation efforts may be relatively new and may not have had time to demonstrate their biological benefit. In such cases, provisions for adequate monitoring and funding of conservation efforts are essential to ensure intended conservation benefits are realized.

During its west coast steelhead status review, NMFS reviewed an array of protective efforts for steelhead and other salmonids, ranging in scope from regional strategies to local watershed initiatives. NMFS has summarized some of the major efforts in a document entitled "Steelhead Conservation Efforts: A Supplement to the Notice of Determination for West Coast Steelhead under the Endangered Species Act" (NMFS, 1996d). NMFS has identified additional conservation measures in the

States of Washington, Oregon that are not specifically addressed in this earlier report. We summarize these additional conservation measures below.

#### *State of Washington Conservation Measures*

The State of Washington is currently in the process of developing a statewide strategy to protect and restore wild steelhead and other salmon and trout species. In May of 1997, Governor Gary Locke and other state officials signed a Memorandum of Agreement creating the Joint Natural Resources Cabinet (Joint Cabinet). This body is comprised of State agency directors or their equivalents from a wide variety of agencies whose activities and constituents influence Washington's natural resources. The goal of the Joint Cabinet is to restore healthy salmon, steelhead and trout populations by improving those habitats on which the fish rely. The Joint Cabinet's current activities include development of the Lower Columbia Steelhead Conservation Initiative (LCSCI), which is intended to comprehensively address protection and recovery of steelhead in the lower Columbia River area.

The scope of the LCSCI includes Washington's steelhead stocks in two transboundary ESUs that are shared by both Washington and Oregon. The initiative area includes all of Washington's stocks in the Lower Columbia River ESU (Cowlitz to Wind rivers) and the portion of the Southwest Washington ESU in the Columbia River (Grays River to Germany Creek). When completed, conservation and restoration efforts in the LCSCI area will form a comprehensive, coordinated, and timely protection and rebuilding framework. Benefits to steelhead and other fish species in the LCSCI area will also accrue due to the growing bi-state partnership with Oregon.

Advance work on the initiative was performed by WDFW. That work emphasized harvest and hatchery issues and related conservation measures. Consistent with creation of the Joint Cabinet, conservation planning has recently been expanded to include major involvement by other state agencies and stakeholders, and to address habitat and tributary dam/hydropower components.

The utility of the LCSCI is to provide a framework to describe concepts, strategies, opportunities, and commitments that will be critically needed to maintain the diversity and long term productivity of steelhead in the lower Columbia River for future generations. The initiative does not represent a formal watershed planning

process; rather, it is intended to be complementary to such processes as they may occur in the future. The LCSCI details a range of concerns including natural production and genetic conservation, recreational harvest and opportunity, hatchery strategies, habitat protection and restoration goals, monitoring of stock status and habitat health, evaluation of the effectiveness of specific conservation actions, and an adaptive management structure to implement and modify the plan's trajectory as time progresses. It also addresses improved enforcement of habitat and fishery regulations, and strategies for outreach and education.

The LCSCI is currently a "work-in-progress" and will evolve and change over time as new information becomes available. Input will be obtained through continuing outreach efforts by local governments and other stakeholders. Further refinements to strategies, actions, and commitments will occur using public and stakeholder review and input, and continued interaction with the State of Oregon, tribes, and other government entities, including NMFS. The LCSCI will be subjected to independent technical review. In sum, these input and coordination processes will play a key role in determining the extent to which the eventual conservation package will benefit wild steelhead.

NMFS intends to continue working with the State of Washington and stakeholders involved in the formulation of the LCSCI. Ultimately, when completed, this conservation effort may ameliorate risks facing many salmonid species in this region.

#### *State of Oregon Conservation Measures*

In April 1996, the Governor of Oregon completed and submitted to NMFS a comprehensive conservation plan directed specifically at coho salmon stocks on the Coast of Oregon. This plan, termed the Oregon Plan for Salmon and Watersheds (OPSW) (formerly known as the Oregon Coastal Salmon Restoration Initiative) was later expanded to include conservation measures for coastal steelhead stocks (Oregon, 1998). For a detailed description of the OPSW, refer to the May 6, 1997, listing determination for Southern Oregon/Northern California coho salmon (62 FR 24602-24606). The essential tenets of the OPSW include the following:

1. The plan comprehensively addresses all factors for decline of coastal coho and steelhead, most notably, those factors relating to harvest, habitat, and hatchery activities.

2. Under this plan, all State agencies whose activities affect salmon are held accountable for coordinating their programs in a manner that conserves and restores the species and their habitat. This is essential since salmon and steelhead have been affected by the actions of many different state agencies.

3. The Plan includes a framework for prioritizing conservation and restoration efforts.

4. The Plan includes a comprehensive monitoring plan that coordinates Federal, state, and local efforts to improve our understanding of freshwater and marine conditions, determine populations trends, evaluate the effects of artificial propagation, and rate the OPSW's success in restoring the salmon.

5. The Plan recognizes that actions to conserve and restore salmon must be worked out by communities and landowners—those who possess local knowledge of problems and who have a genuine stake in the outcome. Watershed councils, soil and water conservation districts, and other grassroots efforts are the vehicles for getting this work done.

6. The Plan is based upon the principles of adaptive management. Through this process, there is an explicit mechanism for learning from experience, evaluating alternative approaches, and making needed changes in the programs and measures.

7. The Plan includes an Independent Multi-disciplinary Science Team (IMST). The IMST's purpose is to provide an independent audit of the OPSW's strengths and weaknesses. They will aid the adaptive management process by compiling new information into a yearly review of goals, objectives, and strategies, and by recommending changes.

8. The Plan requires that a yearly report be made to the Governor, the legislature, and the public. This will help the agencies make the adjustments described for the adaptive management process.

To implement the various monitoring programs associated with the steelhead portion of the OPSW, the State of Oregon Legislature appropriated over \$1 million in January, 1998. This funding commitment is in addition to funds previously allocated for the coho portion of the OPSW.

#### *Tribal Conservation Measures*

A comprehensive salmon restoration plan for Columbia Basin salmon was prepared by the Nez Perce, Warm Springs, Umatilla and Yakama Indian Nations. This plan, Wy-Kan-Ush-Mi Wa-Kish-Wit (The Spirit of the

Salmon)(CRITFC 1996) is more comprehensive than past draft recovery plans for Columbia River basin salmon in that it proposes actions to protect salmon not currently listed under the ESA. The tribal plan sets goals and objectives to meet the multiple needs of these sovereign nations, and provides guidance for management of tribal lands. NMFS will work closely with the four tribes as conservation measures related to Columbia Basin salmonids, particularly those at-risk populations are further developed and implemented.

### Proposed Status of Steelhead ESUs

Section 3 of the ESA defines the term "endangered species" as "any species which is in danger of extinction throughout all or a significant portion of its range". The term *threatened species* is defined as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Thompson, 1991 suggested that conventional rules of thumb, analytical approaches, and simulations may all be useful in making this determination. In previous status reviews, NMFS has identified a number of factors that should be considered in evaluating the level of risk faced by an ESU, including: (1) absolute numbers of fish and their spatial and temporal distribution; (2) current abundance in relation to historical abundance and current carrying capacity of the habitat; (3) trends in abundance; (4) natural and human-influenced factors that cause variability in survival and abundance; (5) possible threats to genetic integrity (e.g., from strays or outplants from hatchery programs); and (6) recent events (e.g., a drought or changes in harvest management) that have predictable short-term consequences for abundance of the ESU.

During the coastwide status review for steelhead, NMFS evaluated both quantitative and qualitative information to determine whether any proposed ESU is threatened or endangered according to the ESA. The types of information used in these assessments are described here, followed by a summary of results for each ESU.

### Quantitative Assessments

A significant component of NMFS' status determination was analyses of abundance trend data. Principal data sources for these analyses were historical and recent run size estimates derived from dam and weir counts and stream surveys. Of the 160 steelhead stocks on the west coast of the United States for which sufficient data existed, 118 (74 percent) exhibited declining

trends in abundance, while the remaining 42 (26 percent) exhibited increasing trends in abundance. Sixty-five of the stock abundance trends analyzed were statistically significant. Of these, 57 (88 percent) indicated declining trends in abundance and the remaining 8 (12 percent) indicated increasing trends in abundance. Aside from analyzing these data, NMFS also considered recent risk assessment modeling conducted by ODFW.

Analyses of steelhead abundance indicate that across the species' range, the majority of naturally reproducing steelhead stocks have exhibited long-term declines in abundance. The severity of declines in abundance tends to vary by geographic region. Based on historical and recent abundance estimates, stocks in the southern extent of the coastal steelhead range appear to have declined significantly, with widespread stock extirpations. In several areas, a lack of accurate run size and trend data make estimating abundance difficult.

### Qualitative Assessments

Although numerous studies have attempted to classify the status of steelhead populations on the west coast of the United States, problems exist in applying results of these studies to NMFS' ESA evaluations. A significant problem is that the definition of "stock" or "population" varies considerably in scale among studies, and sometimes among regions within a study. In several studies, identified units range in size from large river basins, to minor coastal streams and tributaries. Only two studies (Nehlsen et al., 1991; Higgins et al., 1992) used categories that relate to the ESA "threatened" or "endangered" status. Even these studies applied their own interpretations of these terms to individual stocks, not to broader geographic units such as those discussed here. Another significant problem in applying previously published studies to this evaluation is the manner in which stocks or populations were selected for inclusion in the review. Several studies did not evaluate stocks that were not perceived to be at risk, making it difficult to determine the proportion of stocks they considered to be at risk in any given area.

Nehlsen et al., 1991 considered salmon and steelhead stocks throughout Washington, Idaho, Oregon, and California and enumerated all stocks they found to be extinct or at risk of extinction. They considered 23 steelhead stocks to be extinct, one possibly extinct, 27 at high risk of extinction, 18 at moderate risk of

extinction, and 30 of special concern. Steelhead stocks that do not appear in their summary were either not at risk of extinction or there was insufficient information to classify them.

Washington Department of Fisheries et al., 1993 categorized all salmon and steelhead stocks in Washington on the basis of stock origin ("native", "non-native", "mixed", or "unknown"), production type ("wild", "composite", or "unknown") and status ("healthy", "depressed", "critical", or "unknown"). Of the 141 steelhead stocks identified in Washington, 36 were classified as healthy, 44 as critical, 10 as depressed, and 60 as unknown.

The following summaries draw on these quantitative and qualitative assessments to describe NMFS' conclusions regarding the status of each steelhead ESU. A more detailed discussion of status determinations is presented in the "Status Review of West Coast Steelhead from Washington, Idaho, Oregon, and California" and "Status Review Update for Deferred and Candidate ESUs of West Coast Steelhead" (NMFS, 1996a; NMFS, 1997a). Copies of these documents are available upon request (see ADDRESSES).

### Upper Willamette River ESU

Steelhead in the Upper Willamette River ESU are distributed in a few, relatively small, natural populations. Over the past several decades, total abundance of natural late-migrating winter steelhead ascending the Willamette Falls fish ladder has fluctuated several times over a range of approximately 5,000—20,000 spawners. However, the last peak occurred in 1988, and this peak has been followed by a steep and continuing decline. Abundance in each of the last 5 years has been below 4,300 fish, and the run in 1995 was the lowest in 30 years. Declines also have been observed in almost all natural populations, including those with and without a substantial component of naturally spawning hatchery fish. NMFS notes with concern the results from ODFW's extinction assessment, which estimates that the Molalla River population had a greater than 20 percent extinction probability in the next 60 years, and that the upper South Santiam River population had a greater than 5 percent extinction risk within the next 100 years (Chilcote, 1997).

Steelhead native to the Upper Willamette River ESU are late-run winter steelhead, but introduced hatchery stocks of summer and early-run winter steelhead also occur in the upper Willamette River. Estimates of the proportion of hatchery fish in natural



spawning escapements range from 5–25 percent. NMFS is concerned about the potential risks associated with interactions between non-native summer and wild winter steelhead, whose spawning areas are sympatric in some rivers (especially in the Molalla and North and South Santiam Rivers).

#### Listing Determination

Based on new information submitted by ODFW and others, NMFS concludes Upper Willamette River steelhead warrant listing as a threatened species. Recent abundance trends indicate naturally spawned steelhead have declined to historically low levels in areas above Willamette Falls. This low abundance, coupled with potential risks associated with interactions between naturally spawned steelhead and hatchery stocks is of great concern to NMFS.

Recent conservation planning efforts by the State of Oregon may reduce risks faced by steelhead in this ESU in the future; however, these efforts are still in their formative stages. Specifically, the OPSW, while substantially implemented and funded on the Oregon Coast, has not yet reached a similar level of development in inland areas.

#### *Middle Columbia River Basin ESU*

Current population sizes are substantially lower than historic levels, especially in the rivers with the largest steelhead runs in the ESU, the John Day, Deschutes, and Yakima Rivers. At least two extinctions of native steelhead runs in the ESU have occurred (the Crooked and Metolius Rivers, both in the Deschutes River Basin). In addition, NMFS remains concerned about the widespread long- and short-term downward trends in population abundance throughout the ESU. Trends in natural escapement in the Yakima and Umatilla Rivers have been highly variable since the mid to late 1970s, ranging from abundances that indicate relatively healthy runs to those that are cause for concern (i.e., from 2,000–3,000 steelhead during peaks to approximately 500 fish during the low points).

One of the most significant sources of risk to steelhead in the Middle Columbia ESU is the recent and dramatic increase in the percentage of hatchery fish in natural escapement in the Deschutes River Basin. ODFW estimates that in recent years, the percentage of hatchery strays in the Deschutes River has exceeded 70 percent, and most of these are believed to be long-distance strays from outside the ESU. Coincident with this increase in the percentage of strays has been a decline in the abundance of native

steelhead in the Deschutes River. In combination with the trends in hatchery fish in the Deschutes River, estimates of increased proportions of hatchery fish in the John Day and Umatilla River Basins pose a risk to wild steelhead due to negative effects of genetic and ecological interactions with hatchery fish. For example, in recent years, most of the fish planted in the Touchet River are from other ESU stocks. As a result, a recent analysis of this stock by WDFW found that it was most similar genetically to Wells Hatchery steelhead from the Upper Columbia River ESU.

#### *Listing Determination*

The new and updated information considered by NMFS suggest that over the past 34 years, continued declines in steelhead abundance and increases in the percentage of hatchery fish in natural escapements indicate significantly higher risk than was apparent during the initial status review. Taking this new information into consideration, NMFS concludes that the Middle Columbia ESU warrants listing as a threatened species. Recent conservation planning efforts by the States of Washington and Oregon may reduce risks faced by steelhead in this ESU in the future; however, these efforts are still in their formative stages. Specifically, the State of Washington's LCSCI is still in a developmental stage and various technical and financial aspects of the plan need to be addressed (NMFS, 1998). Furthermore, this effort is currently limited to lower Columbia River areas. The OPSW, while substantially implemented and funded on the Oregon Coast, has not yet reached a similar level of development in inland areas.

#### **Proposed Determination**

The ESA defines an endangered species as any species in danger of extinction throughout all or a significant portion of its range, and a threatened species as any species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Section 4(b)(1) of the ESA requires that the listing determination be based solely on the best scientific and commercial data available, after conducting a review of the status of the species and after taking into account those efforts, if any, being made to protect such species.

Based on new information obtained from its coastwide assessment, NMFS concludes that Upper Willamette River steelhead and Middle Columbia River steelhead warrant listing as threatened species under the ESA. The geographic boundaries (i.e., the watersheds within

which the members of the ESU spend their freshwater residence) for these ESUs are described under "ESU Determinations".

In both proposed ESUs, only naturally spawned steelhead are proposed for listing. Prior to the final listing determination, NMFS will examine the relationship between hatchery and naturally spawned populations of steelhead in these ESUs, and assess whether any hatchery populations are essential for their recovery. This may result in the inclusion of specific hatchery populations as part of a listed ESU in NMFS' final determination.

#### **Prohibitions and Protective Measures**

Section 9 of the ESA prohibits certain activities that directly or indirectly affect endangered species. These prohibitions apply to all individuals, organizations, and agencies subject to U.S. jurisdiction. Section 9 prohibitions apply automatically to endangered species; as the following discussion explains, this is not the case for threatened species.

Section 4(d) of the ESA directs the Secretary to implement regulations "to provide for the conservation of [threatened] species," that may include extending any or all of the prohibitions of section 9 to threatened species. Section 9(a)(1)(g) also prohibits violations of protective regulations for threatened species implemented under section 4(d). Therefore, in the case of threatened species, NMFS has discretion under section 4(d) to tailor protective regulations based on the contents of available conservation measures. NMFS has already adopted 4(d) rules that exempt a limited range of activities from take prohibitions. For example, the interim 4(d) rule for Southern Oregon/Northern California coho salmon (62 FR 38479, July 18, 1997) exempts habitat restoration activities conducted in accordance with approved plans and fisheries conducted in accordance with an approved state management plan. In appropriate cases, 4(d) rules could contain a narrower range of prohibitions applicable to activities such as forestry, agriculture, and road construction when such activities are conducted in accordance with approved state or tribal plans.

These examples show that NMFS may apply take prohibitions narrowly in light of the strong protections provided in a state or tribal plan. There may be other circumstances as well in which NMFS would use the flexibility of section 4(d). For example, in some cases there may be a healthy population of salmon or steelhead within an overall ESU that is listed. In such a case, it may

not be necessary to apply the full range of prohibitions available in section 9. NMFS intends to use the flexibility of the ESA to respond appropriately to the biological condition of each ESU and the populations within it, and to the strength of state and tribal plans in place to protect them. Therefore, after further analysis, NMFS will issue protective regulations pursuant to section 4(d) for the Upper Willamette River and Middle Columbia River ESUs.

Section 7(a)(4) of the ESA requires that Federal agencies consult with NMFS on any actions likely to jeopardize the continued existence of a species proposed for listing and on actions likely to result in the destruction or adverse modification of proposed critical habitat. For listed species, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or conduct are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with NMFS.

Examples of Federal actions likely to affect steelhead in the listed ESUs include authorized land management activities of the U.S. Forest Service and U.S. Bureau of Land Management, as well as operation of hydroelectric and storage projects of the Bureau of Reclamation and U.S. Army Corps of Engineers (COE). Such activities include timber sales and harvest, hydroelectric power generation, and flood control. Federal actions, including the COE section 404 permitting activities under the CWA, COE permitting activities under the River and Harbors Act, National Pollution Discharge Elimination System permits issued by the Environmental Protection Agency, highway projects authorized by the Federal Highway Administration, Federal Energy Regulatory Commission licenses for non-Federal development and operation of hydropower, and Federal salmon hatcheries, may also require consultation. These actions will likely be subject to ESA section 7 consultation requirements that may result in conditions designed to achieve the intended purpose of the project and avoid or reduce impacts to steelhead and its habitat within the range of the listed ESUs. It is important to note that the current proposed listing applies only to the anadromous form of *O. mykiss*; therefore, section 7 consultations will not address resident forms of *O. mykiss* at this time.

Sections 10(a)(1)(A) and 10(a)(1)(B) of the ESA provide NMFS with authority

to grant exceptions to the ESA's "taking" prohibitions (see regulations at 50 CFR 222.22 through 222.24). Section 10(a)(1)(A) scientific research and enhancement permits may be issued to entities (Federal and non-Federal) conducting research that involves a directed take of listed species.

NMFS has issued section 10(a)(1)(A) research or enhancement permits for other listed species (e.g., Snake River chinook salmon and Sacramento River winter-run chinook salmon) for a number of activities, including trapping and tagging, electroshocking to determine population presence and abundance, removal of fish from irrigation ditches, and collection of adult fish for artificial propagation programs. NMFS is aware of several sampling efforts for steelhead in the proposed ESUs, including efforts by Federal and state fishery management agencies. These and other research efforts could provide critical information regarding steelhead distribution and population abundance.

Section 10(a)(1)(B) incidental take permits may be issued to non-Federal entities performing activities that may incidentally take listed species. The types of activities potentially requiring a section 10(a)(1)(B) incidental take permit include the operation and release of artificially propagated fish by state or privately operated and funded hatcheries, state or university research on species other than steelhead, not receiving Federal authorization or funding, the implementation of state fishing regulations, and timber harvest activities on non-Federal lands.

#### Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the ESA include recognition, recovery actions, Federal agency consultation requirements, and prohibitions on taking. Recognition through listing promotes public awareness and conservation actions by Federal, state, and local agencies, private organizations, and individuals.

Several conservation efforts are underway that may help reverse the decline of west coast steelhead and other salmonids. These include the Northwest Forest Plan (on Federal lands within the range of the northern spotted owl), PACFISH (on all additional Federal lands with anadromous salmonid populations), Oregon's Plan for Salmon and Watersheds (formerly known as the Oregon Coastal Salmon Restoration Initiative), and Washington's Lower Columbia River Salmon Restoration Initiative. NMFS is very encouraged by a number of these

efforts and believes they have or may constitute significant strides in the efforts in the region to develop a scientifically well grounded conservation plan for these stocks. Other efforts, such as the Middle Columbia River Habitat Conservation Plan, are at various stages of development, but show promise to ameliorate risks facing listed steelhead ESUs. NMFS intends to support and work closely with these efforts—staff and resources permitting—in the belief that they can play an important role in the recovery planning process.

Based on information presented in this proposed rule, general conservation measures that could be implemented to help conserve the species are listed here. This list does not constitute NMFS' interpretation of a recovery plan under section 4(f) of the ESA.

1. Measures could be taken to promote land management practices that protect and restore steelhead habitat. Land management practices affecting steelhead habitat include timber harvest, road building, agriculture, livestock grazing, and urban development.

2. Evaluation of existing harvest regulations could identify any changes necessary to protect steelhead populations.

3. Artificial propagation programs could be required to incorporate practices that minimize impacts upon natural populations of steelhead.

4. Efforts could be made to ensure that existing and proposed dam facilities are designed and operated in a manner that will lessen adverse effects to steelhead populations.

5. Water diversions could have adequate headgate and staff gauge structures installed to control and monitor water usage accurately. Water rights could be enforced to prevent irrigators from exceeding the amount of water to which they are legally entitled.

6. Irrigation diversions affecting downstream migrating steelhead trout could be screened. A thorough review of the impact of irrigation diversions on steelhead could be conducted.

NMFS recognizes that, to be successful, protective regulations and recovery programs for steelhead will need to be developed in the context of conserving aquatic ecosystem health. NMFS intends that Federal lands and Federal activities play a primary role in preserving listed populations and the ecosystems upon which they depend. However, throughout the range of the two ESUs proposed for listing, steelhead habitat occurs and can be affected by activities on state, tribal, or private land. Agricultural, timber, and urban

management activities on non-federal land could and should be conducted in a manner that minimizes adverse effects to steelhead habitat.

NMFS encourages non-Federal landowners to assess the impacts of their actions on potentially threatened or endangered salmonids. In particular, NMFS encourages the establishment of watershed partnerships to promote conservation in accordance with ecosystem principles. These partnerships will be successful only if state, tribal, and local governments, landowner representatives, and Federal and non-Federal biologists all participate and share the goal of restoring steelhead to the watersheds.

#### Critical Habitat

Section 4(a)(3)(A) of the ESA requires that, to the maximum extent prudent and determinable, NMFS designate critical habitat concurrently with a determination that a species is endangered or threatened. NMFS intends to propose critical habitat for all previously listed and currently proposed steelhead ESUs in a forthcoming **Federal Register** notice. Copies of this notice will be available upon request (see ADDRESSES).

#### NMFS Policies on Endangered and Threatened Fish and Wildlife

On July 1, 1994, NMFS, jointly with the U.S. FWS, published a series of policies regarding listings under the ESA, including a policy for peer review of scientific data (59 FR 34270), and a policy to identify, to the maximum extent possible, those activities that would or would not constitute a violation of section 9 of the ESA (59 FR 34272).

*Role of peer review:* The intent of the peer review policy is to ensure that listings are based on the best scientific and commercial data available. Prior to a final listing, NMFS will solicit the expert opinions of three qualified specialists, concurrent with the public comment period. Independent peer reviewers will be selected from the academic and scientific community, tribal and other native American groups, Federal and state agencies, and the private sector.

*Identification of those activities that would constitute a violation of section 9 of the ESA:* The intent of this policy is to increase public awareness of the effect of this listing on proposed and ongoing activities within the species' range. NMFS will identify, to the extent known at the time of the final rule, specific activities that will not be considered likely to result in violation of section 9, as well as activities that

will be considered likely to result in violation. NMFS believes that, based on the best available information, the following actions will not result in a violation of section 9:

(1) Possession of steelhead acquired lawfully by permit issued by NMFS pursuant to section 10 of the ESA, or by the terms of an incidental take statement pursuant to section 7 of the ESA.

(2) Federally approved projects that involve activities such as silviculture, grazing, mining, road construction, dam construction and operation, discharge of fill material, stream channelization or diversion for which consultation has been completed, and when such activity is conducted in accordance with any terms and conditions given by NMFS in an incidental take statement accompanied by a biological opinion.

Activities that NMFS believes could potentially harm the steelhead and result in "take", include, but are not limited to:

(1) Unauthorized collecting or handling of the species. Permits to conduct these activities are available for purposes of scientific research or to enhance the propagation or survival of the species.

(2) Unauthorized destruction/alteration of the species' habitat such as removal of large woody debris or riparian shade canopy, dredging, discharge of fill material, draining, ditching, diverting, blocking, or altering stream channels or surface or ground water flow.

(3) Discharges or dumping of toxic chemicals or other pollutants (i.e., sewage, oil and gasoline) into waters or riparian areas supporting the species.

(4) Violation of discharge permits.

(5) Interstate and foreign commerce (commerce across State lines and international boundaries) and import/export without prior obtainment of an endangered species permit.

This list is not exhaustive; rather, it is provided to give the reader some examples of activities that may be considered by NMFS as constituting a "take" of steelhead under the ESA and associated regulations. Questions regarding whether specific activities constitute a violation of section 9, and general inquiries regarding prohibitions and permits, should be directed to NMFS (see ADDRESSES).

#### Public Comments Solicited

To ensure that the final action resulting from this proposal will be as accurate and effective as possible, NMFS is soliciting comments and suggestions from the public, other governmental agencies, the scientific community, industry, and any other

interested parties. Public hearings will be held in several locations in the range of the proposed ESUs; details regarding locations, dates, and times will be published in a forthcoming **Federal Register** document. NMFS recognizes that there are serious limits to the quality of information available, and, therefore, NMFS has executed its best professional judgement in developing this proposal. NMFS will appreciate any additional information regarding, in particular: (1) biological or other relevant data concerning any threat to steelhead or rainbow trout; (2) the range, distribution, and population size of steelhead in both identified ESUs; (3) current or planned activities in the subject areas and their possible impact on this species; (4) steelhead escapement, particularly escapement data partitioned into natural and hatchery components; (5) the proportion of naturally reproducing fish that were reared as juveniles in a hatchery; (6) homing and straying of natural and hatchery fish; (7) the reproductive success of naturally-reproducing hatchery fish (i.e., hatchery-produced fish that spawn in natural habitat) and their relationship to the identified ESUs; and (8) efforts being made to protect naturally spawned populations of steelhead and rainbow trout in Washington and Oregon.

NMFS also requests quantitative evaluations describing the quality and extent of freshwater and marine habitats for juvenile and adult steelhead as well as information on areas that may qualify as critical habitat in Washington, Oregon, Idaho and California. Areas that include the physical and biological features essential to the recovery of the species should be identified. NMFS recognizes there are areas within the proposed boundaries of these ESUs that historically constituted steelhead habitat, but may not be currently occupied by steelhead. NMFS requests information about steelhead in these currently unoccupied areas and whether these habitats should be considered essential to the recovery of the species or excluded from designation. Essential features include, but are not limited to: (1) habitat for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for reproduction and rearing of offspring; and (5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of the species.

For areas potentially qualifying as critical habitat, NMFS is requesting

information describing: (1) the activities that affect the area or could be affected by the designation, and (2) the economic costs and benefits of additional requirements of management measures likely to result from the designation.

NMFS will review all public comments and any additional information regarding the status of the steelhead ESUs described herein and, as required under the ESA, will complete a final rule within 1 year of this proposed rule. The availability of new information may cause NMFS to reassess the status of steelhead ESUs.

#### Public Hearings

Joint Commerce-Interior ESA implementing regulations state that the Secretary shall promptly hold at least one public hearing if any person so requests within 45 days of publication of a proposed regulation to list a species or to designate critical habitat (See 50 CFR 424.16(c)(3)). In a forthcoming **Federal Register** document, NMFS will announce the dates and locations of public hearings on this proposed rule to provide the opportunity for the public to give comments and to permit an exchange of information and opinion among interested parties. NMFS encourages the public's involvement in such ESA matters.

#### References

A complete list of all references cited herein is available upon request (see ADDRESSES).

#### Classification

The 1982 amendments to the ESA, in section 4(b)(1)(A), restrict the information that may be considered when assessing species for listing. Based on this limitation of criteria for a listing decision and the opinion in *Pacific Legal Foundation v. Andrus*, 675 F. 2d 825 (6th Cir. 1981), NMFS has categorically excluded all ESA listing actions from environmental assessment requirements of the National Environmental Policy Act (NEPA) under NOAA Administrative Order 216-6.

As noted in the Conference Report on the 1982 amendments to the ESA, economic impacts cannot be considered in determinations regarding the status of species. Therefore, the economic analysis requirements of the Regulatory Flexibility Act (RFA) are not applicable to the listing process. In addition, this final rule is exempt from review under E.O. 12866.

At this time NMFS is not proposing protective regulations pursuant to ESA section 4(d). In the future, prior to finalizing its 4(d) regulations for the threatened ESUs, NMFS will comply with all relevant NEPA and RFA requirements.

#### List of Subjects in 50 CFR Part 227

Endangered and threatened wildlife, Exports, Imports, Marine Mammals, Transportation.

Dated: February 26, 1998.

#### Rolland A. Schmitt,

Assistant Administrator for Fisheries,  
National Marine Fisheries Service.

For the reasons set out in the preamble, 50 CFR part 227 is proposed to be amended as follows:

#### PART 227—THREATENED FISH AND WILDLIFE

1. The authority citation for part 227 continues to read as follows:

**Authority:** 16 U.S.C. 1531-1343; subpart B, § 227.12 also issued under 16 U.S.C. 1361 *et seq.*

2. In § 227.4, paragraphs (v) and (w) are added to read as follows:

#### § 227.4 Enumeration of threatened species.

\* \* \* \* \*

(v) Upper Willamette River steelhead (*Oncorhynchus mykiss*). Includes all naturally spawned populations of steelhead (and their progeny) in the Willamette River, Oregon, and its tributaries above Willamette Falls; and

(w) Middle Columbia River steelhead (*Oncorhynchus mykiss*). Includes all naturally spawned populations of steelhead (and their progeny) in streams from above (and excluding) the Wind River, Washington, and the Hood River, Oregon, upstream to (and including) the Yakima River, Washington. Excluded are steelhead from the Snake River Basin.

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