

**FEDERAL COMMUNICATIONS
COMMISSION**

47 CFR Part 73

[MM Docket No. 90-44, RM-7123, RM-7367]

FM Broadcasting Services; East Los Angeles and Long Beach, CA

AGENCY: Federal Communications Commission.

ACTION: Final rule; petition for reconsideration.

SUMMARY: The Chief, Policy and Rules Division dismissed the petition for reconsideration, filed by Antelope Broadcasting Co., Inc., of the *Report and Order* in this proceeding, 60 FR 15255, March 23, 1995 at the request of Antelope. *The Report and Order* had granted the petition (RM-7123) of Spanish Broadcasting System of Florida, Inc. to reallocate Channel 250B from Long Beach, California to East Los Angeles, California, and to modify its permit to specify East Los Angeles as the new community of license. With this action, the proceeding is terminated.

DATES: Effective March 19, 1998.

FOR FURTHER INFORMATION CONTACT: J. Bertron Withers, Jr., Mass Media Bureau, (202) 418-2180.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's *Memorandum Opinion and Order*, MM Docket No. 90-44, adopted February 25, 1998 and released March 6, 1998. The full text of this Commission decision is available for inspection and copying during normal business hours in Commission's Reference Center (Room 239), 1919 M Street, N.W., Washington, DC 20554. The complete text of this decision may also be purchased from the Commission's copy contractor, International Transcription Services, 1231 20th Street, N.W., Suite 140, Washington, DC 20036, (202) 857-3800.

List of Subjects in 47 CFR Part 73

Radio broadcasting.

Federal Communications Commission.

Charles W. Logan,

Chief, Policy and Rules Division, Mass Media Bureau.

[FR Doc. 98-6849 Filed 3-18-98; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 227

[Docket No. 980225046-8060-02; I.D. 073097E]

Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California

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

ACTION: Final rule; notice of determination.

SUMMARY: Previously, NMFS completed a comprehensive status review of west coast steelhead (*Oncorhynchus mykiss*, or *O. mykiss*) populations in Washington, Oregon, Idaho, and California, and identified 15 Evolutionarily Significant Units (ESUs) within this range. After soliciting additional data to resolve scientific disagreements, NMFS now issues a final rule to list two ESUs as threatened under the Endangered Species Act (ESA). The threatened steelhead ESUs are located in Washington, Oregon, and California (Lower Columbia River and Central Valley, California ESUs). NMFS will issue shortly protective regulations under section 4(d) of the ESA for these threatened ESUs.

NMFS has determined that the Oregon Coast, Klamath Mountains Province (KMP), and Northern California ESUs do not warrant listing at this time. Available scientific information and conservation measures indicate these ESUs are now at a lower risk of extinction than at the time of the proposed rule. However, NMFS remains concerned about the status of steelhead in these areas; therefore, the Oregon Coast, KMP, and Northern California ESUs warrant classification as candidate species. NMFS will reevaluate the status of these ESUs within four years to determine whether listing is warranted.

In the two ESUs identified as threatened, only naturally spawned populations of steelhead (and their progeny) residing below naturally and man-made impassable barriers (e.g., impassable waterfalls and dams) are listed. NMFS has examined the relationship between hatchery and natural populations of steelhead in these ESUs and has assessed whether any hatchery populations are essential for their recovery. At this time, no hatchery populations are deemed

essential for recovery (and hence listed) in either of the two listed ESUs.

At this time, NMFS is listing only anadromous life forms of *O. mykiss*.

DATES: Effective May 18, 1998.

ADDRESSES: Branch Chief, Protected Resources Division, NMFS, Northwest Region, 525 NE Oregon Street, Suite 500, Portland, OR 97232-2737.

FOR FURTHER INFORMATION CONTACT: Garth Griffin, 503-231-2005, Craig Wingert, 562-980-4021, or Joe Blum, 301-713-1401.

SUPPLEMENTARY INFORMATION:

Species Background

Oncorhynchus mykiss exhibit one of the most complex suites of life history traits of any salmonid species. *Oncorhynchus mykiss* may exhibit anadromy (meaning they migrate as juveniles from fresh water to the ocean, and then return to spawn in fresh water) or freshwater residency (meaning 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 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 other Pacific salmon, steelhead are iteroparous, meaning 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; Busby *et al.*, 1996). 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, young juveniles or "fry" emerge from the gravel 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 (*i.e.*, summer-run 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 in the Fraser and Columbia River Basins approximately by the Cascade crest (Huzyk and Tsuyuki, 1974; Allendorf, 1975; Utter and Allendorf, 1977; Okazaki, 1984; Parkinson, 1984; Schreck *et al.*, 1986; Reisenbichler *et al.*, 1992). Behnke (1992) proposed classifying 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 approximately Malibu Creek in southern California. There are infrequent anecdotal reports of steelhead occurring as far south as the Santa Margarita River in San Diego County (McEwan and 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 have been identified as being at moderate or high risk of extinction (Nehlsen *et al.*, 1991).

Previous Federal ESA Actions Related to West Coast Steelhead

The history of petitions received regarding west coast steelhead is summarized in the proposed rule published on August 9, 1996 (61 FR

56138). The most comprehensive petition was submitted by Oregon Natural Resources Council and 15 co-petitioners on February 16, 1994. In response to this petition, NMFS assessed the best available scientific and commercial data, including technical information from Pacific Salmon Biological Technical Committees (PSBTCs) and interested parties in Washington, Oregon, Idaho, and California. The PSBTCs consisted primarily of scientists (from Federal, state, and local resource agencies, Indian tribes, industries, universities, professional societies, and public interest groups) possessing technical expertise relevant to steelhead and their habitats. A total of seven PSBTC meetings were held in the States of Washington, Oregon, Idaho, and California during the course of the west coast steelhead status review. NMFS also established a Biological Review Team (BRT), composed of staff from NMFS' Northwest and Southwest Fisheries Science Centers and Southwest Regional Office, as well as a representative of the U.S. Geological Survey Biological Resources Division (formerly the National Biological Service), which conducted a coastwide status review for west coast steelhead (Busby *et al.*, 1996).

Based on the results of the BRT report and after considering other information and existing conservation measures, NMFS published a proposed listing determination (61 FR 56138, August 9, 1996) that identified 15 ESUs of steelhead in the States of Washington, Oregon, Idaho, and California. Ten of these ESUs were proposed for listing as threatened or endangered species; four were found not warranted for listing; and one was identified as a candidate for listing.

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 the five proposed ESUs addressed herein (62 FR 43974, August 18, 1997). In accordance with section 4(b)(6)(B)(i) of the ESA, NMFS deferred its decision on these five remaining steelhead ESUs for 6 months for the purpose of soliciting additional data.

During the 6-month period of deferral, NMFS received new scientific information concerning the status of the proposed ESUs. This new information was considered by NMFS' BRT, and NMFS has now completed an updated status review 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). During this period, NMFS also assessed the status of existing hatchery stocks to determine their ESU status (Memorandum from Michael Schiewe to William Stelle and William Hogarth, January 13, 1998, Status Review Update for Deferred ESUs of West Coast Steelhead: Hatchery Populations). Copies of these memoranda are available upon request (see ADDRESSES). Based on this updated status review and other information, NMFS now issues its final determinations for these five proposed ESUs.

Summary of Comments Received in Response to the Proposed Rule

NMFS held 16 public hearings in California, Oregon, Idaho, and Washington to solicit comments on the proposed rule. One hundred eighty-eight individuals presented testimony at these public hearings. During the 90-day public comment period, NMFS received 939 written comments on the proposed rule from Federal, state, and local government agencies, Indian tribes, non-governmental organizations, the scientific community, and other individuals. A number of comments addressed specific technical issues pertaining to a particular geographic region or *O. mykiss* population. These technical comments were considered by NMFS' BRT in its re-evaluation of ESU boundaries and status and are discussed in the updated Status Review document (NMFS, 1997a).

On July 1, 1994, NMFS, jointly with the U.S. Fish and Wildlife Service (FWS), published a series of policies regarding listings under the ESA, including a policy for peer review of scientific data (59 FR 34270). In accordance with this policy, NMFS solicited 22 individuals to take part in a peer review of its west coast steelhead proposed rule. All individuals solicited are recognized experts in the field of steelhead biology and represent a broad range of interests, including Federal, state, and tribal resource managers, private industry consultants, and academia. Eight individuals took part in the peer review of this action; comments from peer reviewers were considered by NMFS' BRT and are summarized in the updated Status Review document (NMFS, 1997a).

The following is a summary of the comments received in response to the proposed rule:

Issue 1: Sufficiency and Accuracy of Scientific Information and Analysis

Comment: Numerous commenters disputed the sufficiency and accuracy of data which NMFS employed in its proposed rule to list 10 steelhead ESUs as either threatened or endangered under the ESA. Several commenters urged NMFS to delay any ESA listing decisions for steelhead until additional scientific information is available concerning this species.

Response: Section 4(b)(1)(A) of the ESA requires that NMFS make its listing determinations solely on the basis of the best available scientific and commercial data after reviewing the status of the species. NMFS believes that information contained in the agency's status review (Busby et al., 1996), together with more recent information obtained in response to the proposed rule (NMFS, 1997a), represents the best scientific information presently available for the steelhead ESUs addressed in this final rule. NMFS has conducted an exhaustive review of all available information relevant to the status of this species. NMFS has also solicited information and opinion from all interested parties, including peer reviewers as described above. If new data become available to change these conclusions, NMFS will act accordingly.

Issue 2: Description and Status of Steelhead ESUs

Comment: A few commenters disputed NMFS' conclusions regarding the geographic boundaries for some of the ESUs and questioned NMFS' basis for determining these boundaries. Most of these comments pertained to the ESUs south of San Francisco Bay, suggesting that particular river systems be excluded from listing because of the historical or occasional absence of steelhead or rainbow trout.

Response: NMFS has published a policy describing how it will apply the ESA definition of "species" to anadromous salmonid species (56 FR 58612, November 20, 1991). More recently, NMFS and FWS published a joint policy, which is consistent with NMFS' policy, regarding the definition of "distinct population segments" (61 FR 4722, February 7, 1996). The earlier policy is more detailed and applies specifically to Pacific salmonids and, therefore, was used for this determination. This policy indicates that one or more naturally reproducing salmonid populations will be considered to be distinct and, hence, species under the ESA, if they represent an ESU of the biological species. To be considered an ESU, a population must

satisfy two criteria: (1) It must be reproductively isolated from other population units of the same species; 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 have been strong enough to permit evolutionarily important differences to occur in different population units. The second criterion is met if the population contributes substantially to the ecological or genetic diversity of the species as a whole. Guidance on applying this policy is contained in a scientific paper entitled: "Pacific Salmon (*Oncorhynchus* spp.) and the Definition of 'Species' Under the Endangered Species Act." It is also found in a NOAA Technical Memorandum: "Definition of 'Species' Under the Endangered Species Act: Application to Pacific Salmon" (Waples, 1991). A more detailed discussion of individual ESU boundaries is provided below under "Summary of ESU Determinations."

Comment: Several commenters questioned NMFS' methodology for determining whether a given steelhead ESU warranted listing. In most cases, such commenters also expressed opinions regarding whether listing was warranted for a particular steelhead ESU. A few commenters provided substantive new information relevant to making risk assessments.

Response: 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." 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. A more detailed discussion of status of individual ESUs is provided under the section

"Summary of Conclusions Regarding Listed ESUs."

Issue 3: Factors Contributing to the Decline of West Coast Steelhead

Comment: Many commenters identified factors they believe have contributed to the decline of west coast steelhead. Factors identified include overharvest by recreational fisheries, predation by pinnipeds and piscivorous fish species, effects of artificial propagation, and the deterioration or loss of freshwater and marine habitats.

Response: NMFS agrees that many factors, past and present, have contributed to the decline of West Coast steelhead. NMFS also recognizes that natural environmental fluctuations have likely played a role in the species' recent declines. However, NMFS believes other human-induced impacts (e.g., incidental catch in certain fisheries, hatchery practices, and habitat modification) have played an equally significant role in this species' decline. Moreover, these human-induced impacts have likely reduced the species' resiliency to natural factors for decline, such as drought and poor ocean conditions (NMFS, 1996a).

Since the time of this proposed listing, NMFS has 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, 1997b). 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-run steelhead. This study further concludes that data regarding pinniped predation are 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, 1997b). For additional information on this issue see Summary of Factors Affecting Steelhead.

Comment: One peer reviewer and several commenters stated that NMFS' assessment underestimated the significant influence of natural environmental fluctuations on salmonid populations. Several commenters stated that ocean conditions are one of the primary factors for decline. These commenters suggested that any listing

activity should be postponed until the complete oceanographic cycle can be observed.

Response: Environmental changes in both marine and freshwater habitats can have important impacts on steelhead abundance. For example, a pattern of relatively high abundance in the mid-1980s followed by (often sharp) declines over the next decade occurred in steelhead populations from most geographic regions of the Pacific Northwest. This result is most plausibly explained by broad-scale changes in ocean productivity. Similarly, 6 to 8 years of drought in the late 1980s and early 1990s adversely affected many freshwater habitats for steelhead throughout the region. These natural phenomena put increasing pressure on natural populations already stressed by anthropogenic factors, such as habitat degradation, blockage of migratory routes, and harvest (NMFS, 1996a).

Improvement of cyclic or episodic environmental conditions (for example, increases in ocean productivity or shifts from drought to wetter conditions) can help alleviate extinction risk to steelhead populations. However, NMFS cannot reliably predict future environmental conditions, making it unreasonable to assume improvements in abundance as a result of improvements in such conditions. Furthermore, steelhead and other species of Pacific salmon have evolved over the centuries with such cyclical environmental stresses. This species has persisted through time in the face of these conditions largely due to the presence of freshwater and estuarine refugia. As these refugia are altered and degraded, Pacific salmon species are more vulnerable to episodic events, such as shifts in ocean productivity and drought cycles (NMFS, 1996a).

Issue 4: Consideration of Existing Conservation Measures

Comment: Several commenters argued that NMFS had not considered existing conservation programs designed to enhance steelhead stocks within a particular ESU. Some commenters provided specific information on some of these programs to NMFS concerning the efficacy of existing conservation plans.

Response: NMFS has reviewed existing conservation plans and measures relevant to the five ESUs addressed in this final rule and concludes that existing conservation efforts in some cases have helped ameliorate risks facing the species. These conservation efforts are discussed in detail under the section Existing Conservation Efforts.

While several of the plans addressed in comments show promise for ameliorating risks facing steelhead, some of the measures described in comments have not been implemented. Some of these measures are also geographically limited to individual river basins or political subdivisions, thereby improving conditions for only a small portion of the entire ESU.

Even though in two ESUs existing conservation efforts and plans are not sufficient to preclude the need for listings at this time, they are, nevertheless, valuable for improving watershed health and restoring fishery resources. In those cases where well-developed, reliable conservation plans exist, NMFS may choose to incorporate them into the recovery planning process. In the case of threatened species, NMFS also has flexibility under section 4(d) to tailor protective regulations based on the contents of available conservation measures. NMFS has already adopted a 4(d) rule recognizing state conservation efforts that adequately address one or more factors contributing to the decline of a threatened species. For example, the interim 4(d) rule for Southern Oregon/Northern California coho salmon (62 FR 38479, July 18, 1997) relied on an Oregon fishery management plan and regulations rather than applying general take prohibitions to freshwater fishing activity in the Oregon portion of the ESU. It also relied on habitat restoration plans that meet specified standards. In appropriate cases, 4(d) rules could similarly rely on state or tribal forestry, agriculture, road construction and maintenance, or other programs found to provide adequate protections for threatened species.

These examples show that NMFS may apply modified take prohibitions 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.

Issue 5: Steelhead Biology and Ecology

Comment: Several commenters and a peer reviewer asserted that resident rainbow trout should be included in listed steelhead ESUs. Several

commenters also stated that NMFS and FWS should address how the presence of rainbow trout populations may ameliorate risks facing anadromous populations within listed ESUs.

Response: In its August 9, 1996, proposed rule (61 FR 41541), NMFS stated that it was the consensus of NMFS scientists, as well as regional fishery biologists, that based on available genetic information, resident fish should generally be considered part of the steelhead ESUs. However, NMFS concluded that available data were inconclusive regarding the relationship of resident rainbow trout and steelhead. NMFS requested additional data in the proposed rule to clarify this relationship and determine whether resident rainbow trout should be included in listed steelhead ESUs.

In response to this request for additional information, many groups and individuals expressed opinions regarding this issue. In most cases these opinions were not supported by new information that resolves existing uncertainty. Two state fishery management agencies (California Department of Fish and Game (CDFG) and Washington Department of Fish and Wildlife (WDFW)) and one peer reviewer provided comments and information supporting the inclusion of resident rainbow trout in listed steelhead ESUs. In general, these parties also felt that rainbow trout may serve as an important reservoir of genetic material for at-risk steelhead stocks.

While conclusive evidence does not yet exist regarding the relationship of resident and anadromous *O. mykiss*, NMFS believes available evidence suggests that resident rainbow trout should be included in listed steelhead ESUs in certain cases. Such cases include (1) where resident *O. mykiss* have the opportunity to interbreed with anadromous fish below natural or man-made barriers or (2) where resident fish of native lineage once had the ability to interbreed with anadromous fish but no longer do because they are currently above human-made barriers and are considered essential for recovery of the ESU. Whether resident fish that exist above any particular man-made barrier meet these criteria must be reviewed on a case-by-case basis by NMFS. NMFS recognizes that there may be many such cases in California alone. Resident fish above long-standing natural barriers and those that are derived from the introduction of non-native rainbow trout would not be considered part of any salmonid ESU.

Several lines of evidence exist to support this conclusion. Under certain conditions, anadromous and resident *O.*

mykiss are apparently capable not only of interbreeding, but also of having offspring that express the alternate life history form, that is, anadromous fish can produce nonanadromous offspring, and vice versa (Shapovalov and Taft, 1954; Burgner et al., 1992). Mullan et al. (1992) found evidence that, in very cold streams, juvenile steelhead had difficulty attaining "mean threshold size for smoltification" and concluded that "Most fish here [Methow River, Washington] that do not emigrate downstream early in life are thermally-fated to a resident life history regardless of whether they were the progeny of anadromous or resident parents." Additionally, Shapovalov and Taft (1954) reported evidence of *O. mykiss* maturing in fresh water and spawning prior to their first ocean migration; this life history variation has also been found in cutthroat trout (*O. clarki*) and Atlantic salmon (*Salmo salar*).

NMFS believes resident fish can help buffer extinction risks to an anadromous population by mitigating compensatory effects in spawning populations, by providing offspring that migrate to the ocean and enter the breeding population of steelhead, and by providing a "reserve" gene pool in freshwater that may persist through times of unfavorable conditions for anadromous fish. In spite of these potential benefits, presence of resident populations is not a substitute for conservation of anadromous populations. A particular concern is isolation of resident populations by human-caused barriers to migration. This interrupts normal population dynamics and population genetic processes and can lead to the loss of a genetically based trait (anadromy). As discussed in NMFS' "species identification" paper (Waples, 1991), the potential loss of anadromy in distinct population segments may in and of itself warrant listing the ESU as a whole.

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 to be a DPS 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 (Department of Interior (DOI), 1997; FWS, 1997).

In its review of West Coast steelhead, NMFS' BRT stated that rainbow trout and steelhead in the same area may share a common gene pool at least over evolutionary time periods (NMFS, 1997a). The importance of any recovery action is measured in terms of its ability to recover the listed species in the foreseeable future. FWS believes that steelhead recovery will not rely on the intermittent exchange of genetic material between resident and anadromous forms (FWS, 1997). As a result, without a clear demonstration of any risks to resident rainbow trout or of the need to protect rainbow trout to recover steelhead in the foreseeable future, the FWS concludes that only the anadromous forms of *O. mykiss* should be included in the listed steelhead ESUs at this time (FWS, 1997).

Comment: Several commenters and peer reviewers questioned NMFS' inclusion of both summer- and winter-run steelhead in the same ESU. These commenters suggested that summer- and winter-run steelhead be segregated into individual ESUs based on life history differences.

Response: While NMFS considers both life history forms (summer- and winter-run steelhead) to be important components of diversity within the species, new genetic data reinforce previous conclusions that, within a geographic area, summer- and winter-run 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 an ESU 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-run 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-run steelhead should be considered part of the same

ESU in geographic areas where they co-occur.

Summary of ESU Determinations

The following is a summary of NMFS' ESU determinations for these species. A more detailed discussion of ESU determinations is presented in the documents entitled "Status Review Update for West Coast Steelhead from Washington, Idaho, Oregon, and California" (NMFS, 1997a) and "Status Review Update for Deferred ESUs of West Coast Steelhead: Hatchery Populations" (NMFS, 1998a). Copies of these documents are available upon request (see ADDRESSES).

(1) Lower Columbia River ESU

This coastal steelhead ESU occupies tributaries to the Columbia River between the Cowlitz and Wind Rivers in Washington, inclusive, and the Willamette and Hood Rivers in Oregon, inclusive. Excluded are steelhead in the upper Willamette River Basin above Willamette Falls, and steelhead from the Little and Big White Salmon Rivers in Washington. This similarity results from the shared geology of the area and the transportation of Columbia River sediments northward along the Washington coast. Rivers draining into the Columbia River have their headwaters in increasingly drier areas, moving from west to east. Columbia River tributaries that drain the Cascade Mountains have proportionally higher flows in late summer and early fall than rivers on the Oregon coast.

Steelhead populations in this ESU are of the coastal genetic group (Schreck et al., 1986; Reisenbichler et al., 1992; Chapman et al., 1994), and a number of genetic studies have shown that they are part of a different ancestral lineage than inland steelhead from the Columbia River Basin. Genetic data also show steelhead from this ESU to be distinct from steelhead from the upper Willamette River and coastal streams in Oregon and Washington. WDFW data show genetic affinity between the Kalama, Wind, and Washougal River steelhead. These data show differentiation between the Lower Columbia River ESU and the Southwest Washington and Middle Columbia River Basin ESUs. This ESU is composed of both winter- and summer-run steelhead.

NMFS determines that no changes in the boundaries of the Lower Columbia River ESU are warranted. No new information was received from peer reviewers or from other commenters regarding the boundaries of this ESU.

Hatchery Populations Pertaining to This ESU

Hatchery populations considered part of the ESU include late-spawning Cowlitz Trout Hatchery stock (winter-run) and Clackamas River Oregon Department of Fish and Wildlife (ODFW) stock # 122. For late-spawning Cowlitz River steelhead, this decision was based on the following: (1) Their April to late-May spawning period that mirrors the spawn timing of wild winter-run steelhead in this system; (2) the 58-chromosome count exhibited by this stock, which is indicative of native Columbia River Basin origin, in contrast to the 59 or 60 chromosomes seen in Chambers Creek steelhead; and (3) a genetic clustering with native late-spawning winter-run steelhead in the Clackamas River. Clackamas River ODFW hatchery stock # 122, which were recently established, are part of the ESU based on its apparent origin from a local wild population.

Hatchery populations not considered part of the ESU include Chambers Creek/lower Columbia River mix (early-spawning winter-run), Skamania Hatchery stock (summer-run), Eagle Creek National Fish Hatchery (NFH) stock (Clackamas River ODFW stock # 19) (winter-run), Clackamas River ODFW stock # 20 (winter-run), and Hood River ODFW stock # 50 (winter-run). For both Chambers Creek/lower Columbia River mix of early spawning steelhead hatchery stocks and the Eagle Creek NFH stock (also known as Clackamas River ODFW stock # 19), this conclusion is based on the substantial inclusion of original broodstock from outside the ESU and on significant deviation in current run-timing compared with native winter-run steelhead.

Available information indicates that a portion of the original broodstocks for Skamania Hatchery stock (summer-run) and the Clackamas River ODFW stock # 20 (winter-run) originated from outside the ESU. Also, Skamania summer hatchery steelhead stock exhibits a 3-month advanced spawn timing compared with wild summer-run steelhead in the Washougal River. Skamania Hatchery summer-run steelhead were derived from a combination of native Washougal River summer-run steelhead and summer-run steelhead imported from the Klickitat River, which is in the Middle Columbia River ESU. Clackamas River ODFW stock # 20 (raised at Clackamas Hatchery) originated from the Eagle Creek NFH stock (ODFW stock # 19), which was derived from a mixture of indigenous Clackamas River steelhead,

Big Creek Hatchery steelhead from the Southwest Washington ESU, and Donaldson rainbow trout.

At this time, NMFS concludes that Hood River winter-run steelhead ODFW stock # 50 does not warrant inclusion in this ESU. Insufficient genetic data exist at this time to conclusively determine the stock's ESU status.

(2) Oregon Coast ESU

This coastal steelhead ESU occupies river basins on the Oregon coast north of Cape Blanco, excluding rivers and streams that are tributaries of the Columbia River. Most rivers in this area drain the Coast Range Mountains, have a single peak in flow in December or January, and have relatively low flow during summer and early fall. The coastal region receives fairly high precipitation levels, and the vegetation is dominated by Sitka spruce and western hemlock. Upwelling off the Oregon coast is much more variable and generally weaker than in areas south of Cape Blanco. While marine conditions off the Oregon and Washington coasts are similar, the Columbia River has greater influence north of its mouth, and the continental shelf becomes broader off the Washington coast.

Recent genetic data from steelhead in this ESU are limited, but they show a level of differentiation from populations from Washington, the Columbia River Basin, and coastal areas south of Cape Blanco. Ocean migration patterns also suggest a distinction between steelhead populations north and south of Cape Blanco. Steelhead (as well as chinook and coho salmon) from streams south of Cape Blanco tend to be south-migrating rather than north-migrating (Everest, 1973; Nicholas and Hankin, 1988; Percy et al., 1990; Percy, 1992).

The Oregon Coast ESU primarily contains winter-run steelhead; there are only two native stocks of summer-run steelhead. Summer-run steelhead occur only in the Siletz River, above a waterfall, and in the North Umpqua River, where migration distance may prevent full utilization of available habitat by winter-run steelhead. Alsea River winter-run steelhead have been widely used for steelhead broodstock in coastal rivers. Populations of nonanadromous *O. mykiss* are relatively uncommon on the Oregon coast, as compared with other areas, occurring primarily above migration barriers and in the Umpqua River Basin (Kostov, 1995).

Little information is available regarding migration and spawn timing of natural steelhead populations within this ESU. Age structure appears to be similar to other west coast steelhead,

dominated by 4-year-old spawners. Iteroparity is more common among Oregon coast steelhead than in populations to the north.

NMFS determines that no changes in the boundaries of the Oregon Coast ESU are warranted. No new information was received from peer reviewers or from other commenters regarding the boundaries of this ESU.

Hatchery Populations Pertaining to This ESU

At this time, NMFS has not identified hatchery populations pertaining to this ESU.

(3) Klamath Mountains Province ESU

This coastal steelhead ESU occupies river basins from the Elk River in Oregon to the Klamath and Trinity Rivers in California, inclusive. A detailed discussion of this ESU is presented in a previous NMFS status review (Busby *et al.*, 1994). Geologically, this region includes the KMP, which is not as erosive as the Franciscan formation terrains south of the Klamath River Basin. Dominant vegetation along the coast is redwood forest, while some interior basins are much drier than surrounding areas and are characterized by many endemic species. Elevated stream temperatures are a factor affecting steelhead and other species in some of the larger river basins. With the exception of major river basins, such as the Rogue and Klamath, most rivers in this region have a short duration of peak flows. Strong and consistent coastal upwelling begins at about Cape Blanco and continues south into central California, resulting in a relatively productive nearshore marine environment.

Protein electrophoretic analyses of coastal steelhead have indicated genetic discontinuities between the steelhead of this region and those to the north and south (Hatch, 1990; Busby *et al.*, 1993 and 1994). Chromosomal studies have also identified a distinctive karyotype that has been reported only from populations within this ESU. Steelhead within this ESU include both winter-run- and summer steelhead as well as the unusual "half-pounder" life history (characterized by immature steelhead that return to fresh water after only 2 to 4 months in salt water, overwinter-run in rivers without spawning, then return to salt water the following spring).

Among the remaining questions regarding this ESU is the relationship between *O. mykiss* below and above Klamath Falls, OR. Behnke (1992) has proposed that the two groups are in different subspecies and that the upper group, a redband trout (*O. m. newberrii*),

exhibited anadromy until blocked by the Copco dams in the early 1900s. However, Moyle (1976) stated that Klamath Falls was the upstream barrier to anadromous fish prior to construction of the dams.

NMFS determines that no changes in the boundaries of the KMP ESU are warranted. No new information was received from peer reviewers or from other commenters regarding the boundaries of this ESU.

Hatchery Populations Pertaining to This ESU

While NMFS has analyzed the relationship of hatchery stocks to naturally spawned steelhead within the KMP ESU (NMFS, 1998a), this discussion is omitted here since NMFS concludes that KMP steelhead do not warrant listing at this time.

(4) Northern California ESU

This coastal steelhead ESU occupies river basins from Redwood Creek in Humboldt County, CA, to the Gualala River, inclusive. Dominant vegetation along the coast is redwood forest, while some interior basins are much drier than surrounding areas and are characterized by many endemic species. This area includes the extreme southern end of the contiguous portion of the Coast Range Ecoregion (Omernick, 1987). Elevated stream temperatures are a factor in some of the larger river basins (greater than 20° Celsius (C)), but not to the extent that they are in river basins farther south. Precipitation is generally higher in this geographic area than in regions to the south, averaging 100–200 centimeters (cm) of rainfall annually (Donley *et al.*, 1979). With the exception of major river basins, such as the Eel, most rivers in this region have peak flows of short duration. Strong and consistent coastal upwelling begins at approximately Cape Blanco and continues south into central California, resulting in a relatively productive nearshore marine environment.

There are life history similarities between steelhead of the Northern California ESU and the KMP ESU. This ESU includes both winter-run- and summer steelhead, including what is presently considered to be the southernmost population of summer-run steelhead, in the Middle Fork Eel River. Half-pounder juveniles also occur in this geographic area, specifically in the Mad and Eel Rivers. Snyder (1925) first described the half-pounder from the Eel River; however, Cramer *et al.* (1995) suggested that adults with the half-pounder juvenile life history may not spawn south of the Klamath River Basin. As with the Rogue and Klamath

Rivers, some of the larger rivers in this area have migrating steelhead year round, and seasonal runs have been named. River entry ranges from August through June, and spawning from December through April, with peak spawning in January in the larger basins and late February and March in the smaller coastal basins.

NMFS determines that no changes in the boundaries of the Northern California ESU are warranted. No new information was received from peer reviewers or from other commenters regarding the boundaries of this ESU.

Hatchery Populations Pertaining to This ESU

While NMFS has analyzed the relationship of hatchery stocks to naturally spawned steelhead within the KMP ESU (NMFS, 1998a), this discussion is omitted here since NMFS concludes that Northern California steelhead do not warrant listing at this time.

(5) Central Valley, California ESU

This coastal steelhead ESU occupies the Sacramento and San Joaquin Rivers and their tributaries. Excluded are steelhead from San Francisco and San Pablo Bays which are part of the Central California Coast ESU. In the San Joaquin Basin, the best available information suggests that the current range of steelhead has been limited to the Stanislaus, Tuolumne, and Merced Rivers (tributaries) and the mainstem San Joaquin River to its confluence with the Merced River by human alteration of formerly available habitat. The Sacramento and San Joaquin Rivers offer the only migration route to the drainages of the Sierra Nevada and southern Cascade mountain ranges for anadromous fish. The distance from the Pacific Ocean to spawning streams can exceed 300 km, providing unique potential for reproductive isolation among steelhead. The Central Valley is much drier than the coastal regions to the west, receiving on average of only 10 to 50 cm of rainfall annually. The valley is characterized by alluvial soils, and native vegetation was dominated by oak forests and prairie grasses prior to agricultural development. Steelhead within this ESU have the longest freshwater migration of any population of winter-run steelhead. There is essentially one continuous run of steelhead in the upper Sacramento River. River entry ranges from July through May, with peaks in September and February. Spawning begins in late December and can extend into April (McEwan and Jackson, 1996).

There are two recognized taxonomic forms of native *O. mykiss* within the Sacramento River Basin: Coastal steelhead/rainbow trout (*O. m. irideus*, Behnke, 1992) and Sacramento redband trout (*O. m. stonei*, Behnke, 1992). It is not clear how the coastal and Sacramento redband forms of *O. mykiss* interacted in the Sacramento River prior to construction of Shasta Dam in the 1940s. However, it appears the two forms historically co-occurred at spawning time, but may have maintained reproductive isolation.

Two questions were raised by commenters regarding the extent of the Central Valley, California, ESU. These are (1) whether steelhead were native to the San Joaquin River Basin, and (2) whether steelhead in the Central Valley comprised a single ESU or multiple ESUs. New information received during the 6-month deferral period has aided somewhat in addressing these questions.

Recent observations resulting from monitoring efforts for chinook salmon document steelhead juveniles and/or adults in the lower San Joaquin River, the Stanislaus River, the Tuolumne River, and the Merced River. These steelhead appear to represent natural production since hatchery releases in recent years have been made only into the Mokelumne River. CDFG presented evidence that steelhead historically occurred in the San Joaquin River Basin, and, historically, there is no evidence that have been any obvious barriers to colonization of the basin by steelhead. NMFS notes that spring chinook salmon and steelhead have somewhat similar ecological requirements and that the San Joaquin River Basin historically supported large runs of spring chinook salmon. From this, NMFS concludes that steelhead probably historically occurred in the San Joaquin River Basin.

Ecological information provides additional insight into species diversity within this region. First, the Central Valley as a whole can be divided into three ecoregions based largely on elevation and associated changes in climate and rainfall: (1) A mountainous region, averaging about 1000 m elevation, that includes the headwaters of the Sacramento and tributaries to the San Joaquin Rivers; (2) a region of tablelands and hills at intermediate elevation, through which the tributary rivers flow; and (3) the valley itself, which includes broad, flat lands that border the Sacramento and San Joaquin Rivers. Geologically, the upper Sacramento River Basin, which arises from the volcanic Cascade Range, differs from the lower Sacramento and San Joaquin River Basins, which flow out of

the northern and southern Sierra Nevada. The upper Sacramento River Basin is also hydrologically distinct, and it supports native subspecies of resident *O. mykiss*. The southern part of the San Joaquin River Basin is also very distinct ecologically. Limited run-timing information suggests there may have been historic differences between populations in the Sacramento River Basin, three distinct runs may have occurred there as recently as 1947 (McEwan and Jackson, 1996), including a summer-run in the American River (Cramer et al., 1995; McEwan and Jackson, 1996) but the data are far from conclusive. Currently, CDFG considers all Central Valley steelhead to be winter-run steelhead (McEwan and Jackson, 1996), others call them fall-run steelhead (Cramer et al., 1995).

Genetic data indicate that, as a group, Central Valley steelhead are quite distinct from all coastal populations. However, existing data are not very informative regarding historical relationships among populations within the Central Valley. The single sample we have from the San Joaquin River basin is genetically similar to samples from Coleman Hatchery, Feather River Hatchery, and Deer and Mill Creeks in the Sacramento River. It is not clear whether this reflects historical relationships or more recent effects of stock transfers and/or straying by hatchery fish.

After considering this information in the aggregate, NMFS concludes that it is likely that, historically, more than one ESU of steelhead occurred in the Central Valley. However, at this time, existing scientific information does not permit the formulation of ESU boundaries for more than one ESU in this region. Therefore, NMFS concludes that steelhead in the Sacramento and San Joaquin River Basins (Central Valley) should be considered a single ESU until additional information becomes available.

Hatchery Populations Pertaining to This ESU

Hatchery populations considered part of this ESU include the Coleman NFH stock and Feather River Hatchery stock (winter-run). The Coleman NFH and Feather River Hatchery steelhead stocks are part of the ESU since broodstock histories and genetic evidence show these two stocks to be similar to wild steelhead in Deer and Mill Creeks.

Hatchery populations not considered part of the ESU include the Nimbus Hatchery stock and Mokelumne Hatchery stock. Nimbus Hatchery steelhead cluster genetically with Eel River steelhead (Northern California

ESU), the source of much of the steelhead broodstock used to found the Nimbus Hatchery stock. Nimbus Hatchery has provided the vast majority of eggs to the Mokelumne Hatchery.

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, whether 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 education purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; or (5) other natural or human-made factors affecting its continued existence.

As noted earlier, NMFS received numerous comments regarding the relative importance of various factors contributing to the decline of West Coast steelhead. Several recent documents describe in more detail the impacts of various factors contributing to the decline of steelhead and other salmonids (e.g., NMFS, 1997c). 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, 1996a). 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 causes for the decline of West Coast steelhead. The following discussion briefly summarizes findings regarding factors for decline across the range of west coast steelhead. While these factors have been treated here in general terms, it is important to underscore that impacts from certain factors are more acute for specific ESUs. For example, impacts from water diversion are more pervasive for the Central Valley, California, ESU than for some coastal ESUs.

(1) *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 (especially in the Columbia River and Sacramento-San Joaquin Basins) 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 (Forest 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.

(2) *Overutilization for Commercial, Recreational, Scientific, or Education 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, 1996a). 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 naturally spawned steelhead from the Upper Columbia and Snake River Basin ESUs migrate at the same time and are subject to the same fisheries as hatchery-produced steelhead, chinook,

and coho salmon. Incidental harvest mortality in mixed-stock sport and commercial fisheries may exceed 30 percent of naturally spawned populations.

(3) Disease or Predation

Infectious diseases constitute 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 the marine environments. Specific diseases, such as bacterial kidney disease (BKD), ceratomyxosis, columnaris, furunculosis, infectious hematopoietic necrosis virus, 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 and 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 naturally spawned 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 some areas experiencing dwindling steelhead run sizes.

(4) Inadequacy of Existing Regulatory Mechanisms

Federal Land and Water Management

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 the 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 reproducing salmonid stocks, including steelhead, and to the 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 Federal land ownership is not uniformly distributed in watersheds within all the affected ESUs.

Within the range of KMP steelhead, the majority of available steelhead habitat is covered by the requirements of the NFP. Furthermore, on May 6, 1997, Southern Oregon/Northern California coho salmon were listed as a threatened species under the ESA (62 FR 24588) resulting in some new habitat protections. These existing management efforts have resulted in improvements in aquatic habitat conditions for salmonids within this region.

Over the past 3 years, NMFS has consulted with the Arcata, Redding, and Clear Lake U.S. Bureau of Land Management (BLM) Resource Areas and the Six Rivers, Klamath, Shasta-Trinity, and Mendocino National Forests (Forests) on all ongoing and proposed activities that may affect coho salmon and steelhead and their habitats. During this period of time, NMFS reviewed thousands of activities throughout northern California and helped develop numerous programmatic biological assessments (BAs) with the BLM and the Forests. These BAs cover a wide range of management activities, including forest and/or resource area-wide routine and non-routine road maintenance, hazard tree removal, range allotment management, watershed and instream restoration, special use permits (e.g., mining, ingress/egress), timber sale programs (e.g., green tree, fuel reduction, thinning, regeneration, and salvage), and BLM's land tenure adjustment program. Numerous other project-specific BAs received consultations and conferences. These forest and resource area-wide BAs include region-specific best management practices, all necessary

measures to minimize impacts for all listed/proposed anadromous salmonids, monitoring, and environmental baseline checklists for each project. These BAs have resulted in a more consistent approach to management of public lands throughout the NFP and PACFISH areas.

On October 27, 1986, the Klamath Act (Pub. L. 99-552) was passed by Congress authorizing a 20-year-long Federal-State cooperative Klamath River Basin Conservation Area Restoration Program for the rebuilding of the river's fish resources. The Act created a 14-member Klamath River Basin Fisheries Task Force and directs the U.S. Secretary of Interior to cooperate with the Task Force in the creation and implementation of a Klamath River Basin Conservation Area Fishery Restoration Program (KRBFTF, 1991). The Task Force members are appointed by, and represent, the Governors of California and Oregon; the U.S. Secretaries of Interior, Commerce and Agriculture; the California counties of Del Norte, Humboldt, Siskiyou and Trinity; Hoopa Valley, Karuk and Yurok Indian tribal fishers; as well as by anglers and commercial fishermen. The KMP Act also created an 11-member Klamath Fishery Management Council to "establish a comprehensive long-term plan and policy * * * for the management of the in-river and ocean harvesting that affects or may affect Klamath and Trinity River basin anadromous salmon populations." The Council comprises essentially the same interests as the Task Force, except for the four county representatives which hold seats only on the Task Force.

In October 1984, the Trinity River Basin Fish and Wildlife Restoration Act (Act) was enacted by Congress. The Act appropriated \$33 million over a 10-year period for design and construction of restoration projects and \$2.4 million annually for operation, maintenance, and monitoring. The Act embodied in law an 11-point plan to restore and maintain fish and wildlife resources in the basin at levels which occurred prior to the construction of the Trinity River Diversion, Central Valley Project. The Trinity River Basin Fish and Wildlife Task Force was formed to investigate and develop an action plan to identify and correct fish and wildlife problems in the Trinity River basin. In 1982, the Task Force issued the Trinity River Basin Fish and Wildlife Management Program Report, which outlined five major goals to restore fish and wildlife. The report identified ten major actions and associated costs to restore fish populations and rehabilitate habitat. A 3-year action plan was issued by the

Task Force in 1988 and a second 3-year plan was issued in 1992. This most recent plan identifies over 100 restoration, supplementation, and monitoring activities to be completed over the next 3 years. Presently, final flow measurements are being analyzed by FWS to determine necessary flows and system capabilities for anadromous salmonids in the basin, and an Environmental Impact Statement, and National Environmental Policy Act (NEPA) report should be released in 1998. The funding for this project expired at the end of Fiscal Year (FY) 1995 and was re-authorized through FY 1998. However, many of the identified restoration activities have only just begun, and, unless this legislation is re-authorized, they will not be completed.

The Pacific Gas and Electric's (PG&E) Potter Valley hydroelectric project is a major diverter of water from the mainstem Eel River located in the Northern California ESU. This water is diverted into the Russian River basin to generate hydroelectric power and provide water for agriculture and urban uses. Pursuant to a Federal Energy Regulatory Commission (FERC) licensing requirement, PG&E was required, in consultation with FWS and CDFG, to develop and implement a 10-year monitoring program and develop recommendations for modifications in the flow release schedule or project structures and operations necessary to protect and maintain fishery resources. This study was completed in 1996, as was construction of a \$14 million fish screen facility at the Van Arsdale Dam diversion on the Eel River. Based on the results of the monitoring study, NMFS, FWS, CDFG, and PG&E have recently completed negotiations on a plan to increase project flows to the Eel River by an additional 15 percent (20 TAF), as well as to make non-flow related capital improvements. This plan will be submitted to FERC by March 30, 1998, which will in turn trigger a NEPA review of the proposal. The provision of additional instream flows in the Eel River, in conjunction with the new fish screening facility, are expected to improve habitat quality and benefit steelhead in this ESU by increasing survival. As part of the proposal being carried forward to FERC, PG&E will also implement or fund additional mitigation measures that will provide benefits to both salmon and steelhead in the Eel River. These measures include direct funding of \$30,000 annually to CDFG, funding of squaw fish suppression in the Eel River, and funding of various monitoring activities.

Central Valley steelhead are benefitting from two major conservation

initiatives which are being simultaneously implemented and developed to conserve and restore anadromous fish resources, including steelhead, in California's Central Valley. These include the Federal Central Valley Project Improvement Act (CVPIA) which was passed by Congress in 1992 and the CALFED Bay-Delta Program (CALFED Program) which is a joint State/Federal effort implemented in 1995.

The CVPIA is specifically intended to remedy habitat and other problems associated with the construction and operation of the Bureau of Reclamation's (BOR's) Central Valley Project. The CVPIA has two key features related to steelhead. First, it directs the Secretary of the Interior to develop and implement a program that makes all reasonable efforts to double natural production of anadromous fish in Central Valley streams (Section 3406(b)(1)) by the year 2002. This plan, which is called the Anadromous Fish Restoration Program (AFRP), was initially drafted in 1995 and subsequently revised in 1997. Funding has been appropriated since 1995 to implement restoration projects identified in the AFRP planning process. Second, the CVPIA dedicates up to 800,000 acre feet (AF) of water annually for fish, wildlife, and habitat restoration purposes (Section 3406(b)(2)) and provides for the acquisition of additional water to supplement the 800,000 AF (Section 3406(b)(3)). FWS, in consultation with other Federal and State agencies, has directed the use of this dedicated water yield since 1993.

The AFRP addresses six anadromous fish species, including steelhead, identified for restoration in the CVPIA. The revised 1997 plan presents the goals, objectives, and strategies of the AFRP; describes processes the AFRP used to identify, develop, and select restoration actions; and lists actions and evaluations determined at a programmatic level to be reasonable to implement as part of the AFRP. FWS intends to finalize this restoration plan in 1998 following completion of the Programmatic Environmental Impact Statement (PEIS) required by Section 3409 of the CVPIA. Additionally, FWS and BOR have released guidelines in the form of two administrative proposals that will provide guidance for several key aspects of the AFRP implementation. A draft administrative proposal regarding the development of the AFRP was released in June 1997. A final administrative proposal on the management of section 3406(b)(2) water and a set of flow-related actions for the

next 5 years was released by DOI in November, 1997. These plans will be updated to include new information, consistent with the adaptive management approach described in the AFRP. To make restoration efforts as efficient as possible, the AFRP has committed to coordinate restoration efforts with those by other groups or programs. DOI has committed to working with NMFS, CDFG, and others to coordinate actions in this implementation and recovery plans for anadromous fish and for listed and proposed species under the ESA.

The CVPIA obligated \$1.9 million in 1996 for 11 site-specific restoration actions and evaluations authorized by the AFRP, and \$9.7 million for over 30 restoration projects in 1997. In 1998, the AFRP's projected budget for habitat restoration activities in the Central Valley is \$8.2 million. Continued long term funding of AFRP restoration activities is currently authorized in the CVPIA. An estimated \$20 million to \$35 million will be spent on AFRP restoration actions per year for 25 years (\$500 million to \$875 million estimated total), most of which will be closely integrated with funding for activities implemented through the CALFED Bay-Delta Program.

The second conservation initiative that benefits Central Valley steelhead and other species is the CALFED Program. In June 1994, state and Federal agencies, including NMFS, signed a framework agreement that pledged all agencies would work together to formulate water quality standards to protect the Bay-Delta, coordinate State Water Project and Central Valley Project operations in the Bay-Delta, and develop a long-term Bay-Delta solution that would address ecosystem restoration and other objectives. In December 1994, a diverse group of state and Federal agencies, water agencies, and environmental organizations signed the Bay-Delta Accord which set out specific interim (3-year plan) measures for environmental protection, including the protection of Central Valley anadromous salmonids. The CALFED Program, which began in June 1995, is charged with the responsibility of developing a long-term Bay-Delta solution. The 1994 Bay-Delta Accord was recently extended through December 31, 1998.

Three types of environmental protection measures are detailed in the Bay-Delta Accord: (1) Control of freshwater outflow in the Delta to improve estuarine conditions in the shallow-water habitat of the Bay-Delta estuary (Category I measures); (2) regulation of water project operations

and flows to minimize harmful environmental impacts of water exports (Category II measures); and (3) implementation of projects to address non-flow related factors affecting the Bay-Delta ecosystem, such as unscreened diversions, physical habitat degradation, and pollution (Category III measures). Many of the Category I and II measures identified in the agreement were implemented by a Water Quality Control Plan that was adopted by the State Water Resources Control Board in 1995. Efforts were also initiated to fund and implement Category III non-flow projects beginning in 1995.

The CALFED Program completed Phase I in September 1996 with the identification of problems confronting the Bay-Delta system, the development of a mission statement and guiding principals, and the development of three basic alternative approaches to solving the problems. Currently in Phase II, the CALFED Program has refined the preliminary alternatives and is conducting a comprehensive programmatic environmental review with implementation strategies. In addition to the development of three water conveyance and storage alternatives, the CALFED Program has developed four common programs to resolve regional problems: ecosystems quality, water quality, levee system vulnerability, and water system reliability. A major element of the CALFED Program is the Ecosystem Restoration Program Plan (ERPP) which is intended to provide the foundation for long-term ecosystem and water quality restoration and protection throughout the region. Since adoption of the Bay-Delta Accord, urban water users have contributed approximately \$21 million and State Proposition 204 has generated an additional \$60 million for Category III non-flow habitat restoration projects. Among the non-flow factors for decline that have been targeted by the Category III program are unscreened diversions, waste discharges and water pollution prevention, impacts due to poaching, land derived salts, exotic species, fish barriers, channel alterations, loss of riparian wetlands, and other causes of estuarine habitat degradation. To ensure that Category III habitat restoration projects are coordinated with the Federal CVPIA and implemented in accordance with the draft ERPP, the CALFED Program's Restoration Coordination Program administers Category III funds and coordinates its funding with other related restoration programs and funding sources.

Continued funding of CALFED program activities and the Category III

program are assured through funds provided by State Proposition 204, Federal funding through the DOI, and contributions by water development agencies under Category III. The total cost for implementing the ERPP component of the long-term CALFED Program has been estimated at \$1.5 billion, of which about half should be available through State Proposition 204 bonds and expected Federal appropriations. These funds will be used to provide the initial funding necessary to begin implementing the ERPP. The current ERPP implementation strategy assumes that \$390 million of Proposition 204 funding will be available for use after the CALFED Program's long-term plan is formally adopted by the CALFED agencies through filing of a Record of Decision for the Federal EIS and certification of the EIS by the California Resources Agency in late 1998.

Collectively, the CVPIA and CALFED conservation programs have the potential to provide a comprehensive conservation response to the extensive ecological problems facing steelhead and other salmonids in the Central Valley. However, the scope, intensity and effectiveness of the CALFED Program is still coming into focus. Therefore, NMFS concludes that the conservation measures provided by these programs are not currently sufficient to ensure recovery of steelhead. Nevertheless, NMFS believes the level of risk faced by the Central Valley steelhead ESU has diminished considerably since the 1996 listing proposal as a result of habitat restoration and other measures that have recently been implemented through the CALFED and CVPIA programs. NMFS is committed to working with the State and CALFED agencies to build on these programs to ensure that all risks to steelhead are adequately addressed. Through the prioritization of restoration funds available through the CALFED and CVPIA programs, NMFS can assist with the establishment of objectives and targets and implementation strategies which address many of the primary risk factors for Central Valley steelhead.

In the San Joaquin River Basin of the Central Valley, collaboration between water interests and state and Federal resource agencies, including NMFS, has led to the development of a scientifically based, adaptive fisheries management plan known as the Vernalis Adaptive Management Plan (VAMP). The VAMP will provide environmental benefits for fall-run chinook salmon smolts in the Delta and lower San Joaquin River and its tributaries by (1) using current scientific knowledge to

enhance smolts survival by modifying flows; and (2) gathering additional scientific information on the effects of various San Joaquin River flows and Delta water export rates on the survival of salmon smolts to permit adaptive changes. This 12-year plan will be implemented through experimental flows in the San Joaquin Basin and operational changes at the Delta pumping plants during the peak chinook salmon smolts out-migration period (about April 15 to May 15). Initial implementation of the VAMP is scheduled for spring 1998; however, negotiations regarding some aspects of the program continue. The current focus of VAMP is to provide better protection for fall chinook in the San Joaquin basin. However, NMFS expects that the long-term commitment of all participating parties to fully implement the plan will provide ancillary benefits to Central Valley steelhead through improved flow and passage conditions.

State Land Management

The California Department of Forestry and Fire Protection (CDF) enforces the State of California's forest practice rules (CFPRs) on private and State managed forests, and these rules are promulgated through the State Board of Forestry (BOF). Timber harvest activities have been documented to result in negative effects on streams and streamside zones, including the loss of large woody debris, increased sedimentation, loss of riparian vegetation, and the loss of habitat complexity and connectivity. In the California portion of the KMP steelhead ESU, a relatively small percentage of the major river basins (i.e., the Smith, Klamath, and Trinity River basins) are composed of private forest lands where timber harvest is managed by CDFG. In these basins, private forest lands average approximately 18 percent of the total acreage, with a range of 17 (Trinity River) to 23 (Smith River) percent. In contrast, a much higher percentage of the acreage comprising the major river basins in the Northern California ESU (i.e., Redwood Creek, Mad River, Eel River, Mattole River, Ten Mile River, Noyo River, Big River, Albion River, Navarro River, Garcia River, and Gualala River) are composed of private forest lands where timber harvest is managed by CDFG. In these 11 river basins, private forest lands average about 75 percent of the total acreage, with a range of 42 percent (Eel River) to 94 percent (Gualala River).

NMFS has reviewed the CFPRs to determine their adequacy for protecting anadromous salmonids in California. Specifically, the review determined that, although the CFPRs mandate

protection of sensitive resources such as salmonids, the CFPR provisions and their implementation and enforcement, fall short of accomplishing his objective. Specific problems with the CFPRs include the inclusion of many protective provisions that are not supported by or with scientific literature; (2) provisions that are scientifically inadequate to protect salmonids including steelhead; (3) inadequate and ineffective cumulative effects analysis; (4) dependency upon registered professional foresters (RPFs) that may not possess the necessary level of multi-disciplinary technical expertise to develop appropriate THPs; (5) dependency by CDFG on other State agencies to review and comment on THPs; (6) failure of CDFG to incorporate recommendations from other agencies; and (7) inadequate enforcement due to staffing limitations.

On April 29, 1997, CDFG issued guidelines to RPF's for the protection of coho salmon which had been recently listed under the ESA. These "coho considerations" are an improvement over the CFPRs for the protection of steelhead in addition to coho salmon, but they are voluntary and not part of the CFPR provisions. Consequently, implementation of these provisions is unpredictable.

The CFPRs could be an effective vehicle for protecting steelhead and other species and reversing the factors for decline if there were substantial changes made to the provisions and their implementation and enforcement. Such changes include the following: (1) The provision for scientific peer review of the CFPRs, including science-based recommendations for modification of provisions; (2) development of comprehensive cumulative effects analyses; (3) implementation of mandatory provisions to protect anadromous fish; (4) additional and specialized training of RPFs, increased funding and staffing to review THPs; (5) improved enforcement of the CFPRs and THP requirements; and (6) mandatory incorporation of other State agency comments and modifications into THPs. Until a comprehensive scientific peer review process is adopted and appropriate changes to the CFPRs and the THP approval process are made, properly functioning habitat conditions will not exist in the KMP and Northern California steelhead ESUs.

The State is currently funding a conservation planning effort in Del Norte, Humboldt, Mendocino, Siskiyou, and Trinity counties to review and analyze all county General Plans, ordinances, and policies relating to activities affecting salmon and

steelhead. Examples of such activities include riparian habitat maintenance and setbacks, riparian water withdrawal, grading, erosion and sediment control, storm water retention, floodplain development, and stream crossings. Gaps or inconsistent policy application will be identified and General Plans or ordinances will be modified to better protect salmon and steelhead.

The Washington Department of Natural Resources implements and enforces the State of Washington's forest practice rules (WFPRs) which 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 conditions in riparian and instream habitats. Specifically, the base WFPRs do not adequately address large woody debris (LWD) 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 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). The guidance focuses on achieving 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 Total Maximum Daily Loads (TMDLs; see following discussion) should over the long-term improve water quality; the extent to which other habitat impacts will be ameliorated is unknown.

Impacts from agricultural and grazing practices have not historically been closely regulated in California. This is an important concern to NMFS because a substantial amount of acreage in the KMP and Northern California ESU is comprised of farmland. Private lands, and public lands not administered by the federal government, are now being

addressed by the California Rangeland Water Quality Management Plan (CRWQMP) which was adopted by the State Water Resources Control Board as a voluntary compliance effort in accordance with its Non-point Source Management Plan. The emphasis of the CRWQMP is on outreach and education with assistance from the Natural Resources Conservation Service (NRCS), University of California Cooperative Extension, and California Association of Resource Conservation Districts (CSRCs), and the California Cattleman's Association. The Best Management Practices (BMPs) contained in the CRWQMP are derived from the NRCS Field Office Technical Guides.

Under this program, the NRCS, Cooperative Extension and CARCD encourage rangeland owners to develop and implement ranch plans or other documents detailing their management goals and practices. NRCS and Cooperative extension provide training in this effort and the NRCS can condition assistance on implementation of the BMPs set forth in the CRWQMP. The Regional Water Control Boards promote implementation of the CRWQMP by also encouraging landowners to develop plans and by requiring ranch plans to be developed and implemented in accordance with the CRWQMP for watershed listed under section 303(d) of the CWA as requiring the development of TMDLs. As noted below, TMDLs will be developed for most all streams in the Northern California and KMP steelhead ESUs under the terms of a recent consent decree. Between 1995-1998, rangeland plans were developed under the CRWQMP for more than 250,000 acres on the north coast ranging from San Francisco to the Oregon border. The State plans to review the implementation status of these plans at intervals of 3, 5 and 10 years, provided resources are available. Efforts are currently in progress to incorporate existing rangeland management plans in the Garcia River into the TMDL development process for that watershed. NMFS is encouraged by these ongoing efforts. Plans that are consistent with this guidance are likely to result in meeting state water quality standards, but the program is voluntary and it is uncertain to what extent their implementation will contribute to improved habitat conditions and riparian function.

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.

The Corps of Engineers, State, and local governments recently developed and implemented procedures reviewing, approving and monitoring gravel mining activities in Del Norte and Humboldt counties which are authorized under a Letter of Permission process. This process now regulates gravel mining in a substantial portion of the north coast, including all of the Klamath Mountains Province in California and a substantial portion of the Northern California ESU (including the Mad, Eel and Van Duzen Rivers). These procedures are designed to provide substantially improved protection for anadromous fish and their habitats, including steelhead. Important features of this new process include: A prohibition on gravel mining in the active channel except in limited instances, a restriction of gravel operations to the dry season, monitoring of channel cross section to detect channel degradation, fisheries monitoring, gravel mining on a sustained yield basis, and watershed-level analysis of gravel mining. NMFS participated in the development of these procedures and has concluded, through section 7 consultation with the Corps, that these procedures will not jeopardize the continued existence of coho salmon or steelhead in the KMP and Northern California ESUs.

Water Quality Programs

The Federal 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 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 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. Furthermore, TMDLs for water quality-limited waterbodies may address several factors including, temperature levels, sediment load, nutrient input, and dissolved oxygen levels.

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. As a result of a recent consent decree, EPA and the North Coast Regional Water Quality Control Board (Board) have committed to preparing TMDLs for 18 river basins in California. All of these river basins are located within the Northern California or KMP steelhead ESUs, the majority of which (12) are located within the Northern California ESU. The consent decree establishes a schedule for developing TMDL criteria for listed rivers. Under this schedule, seven river basins in the Northern California ESU will have TMDLs developed within the next 2 years, with the remaining rivers having TMDLs developed by 2002. TMDLs for rivers in the KMP steelhead ESU (e.g., Klamath, Trinity, Scott, and Shasta Rivers) will not be developed until after 2001. This legally-binding schedule will result in significant progress on improving the beneficial uses of these watersheds, where the beneficial use has been identified as habitat for salmonids.

Currently, a sediment TMDL has been established for the Garcia River in the Northern California steelhead ESU. This TMDL will ultimately be adopted into the Water Quality Control Plan for the North Coast Basin (Basin Plan) in 1998. The adoption of the Strategy into the Basin Plan carries significant weight for compliance. The completion of the Garcia River TMDL and the initiation of TMDLs for the other listed rivers represent a significant step forward in improving watershed health for steelhead and other salmonids on the north coast of California.

State agencies in Oregon are committed to completing TMDLs for coastal drainages within 4 years, and all impaired waters within 10 years. Similarly ambitious schedules are being developed for Washington.

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. Furthermore, it is essential EPA consults with NMFS on

the formulation of TMDLs in waters that contain listed salmonids. Such consultations will help ensure TMDLs adequately address the needs of these species.

State Hatchery and Harvest Management

In an attempt to mitigate the loss of habitat and to enhance fishing opportunities, 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 native, naturally reproducing stocks are not well understood. Competition, genetic introgression, and disease transmission resulting from hatchery introductions may significantly reduce the production and survival of native, naturally reproducing steelhead (NMFS, 1996a). 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.

In the past, non-native steelhead stocks have been introduced as broodstock in hatcheries and widely transplanted in many coastal rivers and streams in California (Bryant, 1994; Busby *et al.*, 1996; NMFS, 1997a). Because of problems associated with this practice, CDFG developed its Salmon and Steelhead Stock Management Policy. This policy recognizes that such stock mixing is detrimental and seeks to maintain the genetic integrity of all identifiable stocks of salmon and steelhead in California, as well as to minimize interactions between hatchery and natural populations. To protect the genetic integrity of salmon and steelhead stocks, this policy directs CDFG to evaluate each salmon and steelhead stream and to classify it according to its probable genetic source and degree of integrity.

Hatchery programs and harvest management have strongly influenced steelhead populations in the Lower Columbia River and Central Valley, California, 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 have detrimentally impacted some populations.

The three state agencies (ODFW, WDFG, and CDFG) have adopted and are implementing natural salmonid

policies designed to limit hatchery influences on natural, indigenous steelhead. Sport fisheries now focus on harvest of 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 are necessary in order to minimize impacts on listed species.

(5) 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, 1996a).

Efforts Being Made To Protect West Coast Steelhead

Section 4(b)(1)(A) of the ESA requires the Secretary to make listing determinations solely on the basis of the best scientific and commercial data available and after taking into account state 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 whether 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, 1996b). 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, 1996c). During the 6-month period of deferral, NMFS identified additional conservation measures in the States of Washington, Oregon, and California. 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 consists 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. In the near term, for steelhead and other listed species, individual components of the conservation effort may be recognized through section 4(d) of the ESA. In this way activities conducted in accordance with full, matured, and implemented conservation efforts may be excepted from take under section 9 of the ESA.

In conjunction with the LCSCI process, industry in the Lower Columbia River ESU sponsored the review and assessment of existing conservation programs in this region (Cramer, 1997). This assessment provided a helpful summary of measures, which if fully implemented and funded, may aid in conserving

steelhead in this region. In particular, NMFS found this assessment's analysis of impacts associated with trout fisheries on juvenile steelhead helpful in analyzing existing state harvest regulations.

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). The essential tenets of the OPSW include the following:

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

b. 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 activity is essential since salmon and steelhead have been affected by the actions of many different state agencies.

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

d. The Plan includes a comprehensive monitoring plan that coordinates Federal, state, and local efforts to improve 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.

e. 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 those 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.

f. 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.

g. The Plan includes an Independent Multidisciplinary 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.

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

To implement the various monitoring and other programs associated with the steelhead portion of the OPSW, the Oregon Legislative Emergency Board allocated just under \$2 million in January 1998. This funding commitment is in addition to funds previously allocated for the coho portion of the OPSW.

The state of Oregon recently implemented changes to its fishing regulations that will help conserve steelhead in the Oregon portion of the KMP ESU (State of Oregon, 1998). These regulations, adopted on February 5, 1998, and in effect prior to this listing determination, include the following: (1) Elimination of steelhead retention fisheries in all areas of the KMP ESU except select areas in the Rogue River basin; (2) creation of sanctuary areas for rearing steelhead where no angling is permitted; (3) elimination of the use of bait in trout fisheries that could negatively impact juvenile steelhead; (4) implementation of season closures for trout species during juvenile steelhead out-migration; and (5) modification of gear requirements to protect juvenile steelhead in trout fisheries. NMFS has analyzed these harvest regulation changes and finds that these harvest regulations, coupled with existing hatchery management practices, will greatly reduce mortality to adult and juvenile steelhead in the KMP ESUs (NMFS, 1998b). Current harvest regulations and hatchery programs will be modified in the future if monitoring results indicate that changes are needed. Such changes will be made after the State and NMFS confer on them.

In addition to these recently adopted harvest regulations, the state of Oregon has committed to: (1) Devise and fund monitoring programs, in association with NMFS, to assess stock status and redirect existing management programs if need be; (2) establish a process for setting wild steelhead escapement goals; (3) continue to implement marking of all hatchery steelhead; and (4) eliminate stocking of hatchery trout in juvenile

steelhead rearing habitat. These commitments and additions to the OPSW are captured in a letter from John Kitzhaber, Governor of Oregon to William Stelle, Jr., dated March 11, 1998 (Oregon, 1998).

State of California Conservation Measures

The state of California's program for steelhead conservation consists of several major elements: (1) The CALFED Bay-Delta program, including the integrated components of the CVPIA; (2) the Governor's Watershed Restoration and Protection Council (WPRC) program, including ongoing State efforts to implement the watershed planning and habitat restoration objectives contained in Senate Bill (SB) 271; (3) CDFG strategic management plans for steelhead in the KMP and Northern California ESUs; and (4) a joint Memorandum of Agreement between NMFS and the State. The following briefly summarizes these measures and their benefits for steelhead.

(1) CALFED Bay-Delta Program and CVPIA

The CALFED Bay-Delta Program and CVPIA are discussed in detail above under "Summary of Factors Affecting the Species." Collectively, these Central Valley programs have the potential to provide a comprehensive conservation response to the extensive ecologic problems facing at-risk salmonids, including Central Valley steelhead. However, the scope, intensity, and effectiveness of the CALFED Program are still coming into focus. Therefore, NMFS concludes that the conservation measures provided for by this program are not currently sufficient to ensure long-term recovery of steelhead.

NMFS reviewed and evaluated habitat restoration efforts implemented by the CALFED and CVPIA programs to date, as well as other recently implemented measures (NMFS, 1998c). Based on this review, NMFS concludes that Central Valley steelhead have benefitted from improved habitat protection resulting from the placement of new fish screens, modifications of barriers to fish passage, and various habitat acquisition and restoration projects. NMFS believes that the benefits provided by these habitat improvements, and other measures recently implemented, have diminished the risk faced by Central Valley steelhead ESU. Furthermore, NMFS is committed to continue working with Federal and state agencies to build on the CALFED and CVPIA programs to ensure that all risks to steelhead are adequately addressed. Through the prioritization of restoration monies

under the CALFED and CVPIA programs, NMFS can assist with the establishment of objectives and targets, as well as implementation strategies, that address the primary risk factors for Central Valley steelhead.

(2) WPRC Program and Implementation of SB 271

In July, 1997, California's Governor signed Executive Order W-159-97 which created the WPRC. The WPRC, which is chaired by the Secretary of Resources, is an umbrella body consisting of all State agencies that have programs addressing anadromous salmonid protection and restoration. Under State law, the WPRC is charged with (1) providing oversight of all State activities aimed at watershed protection and enhancement, including the conservation and restoration of anadromous salmonids in California, and (2) directing the development of a Watershed Protection Program that provides for anadromous salmonid conservation in the State. The WPRC has established a 12-member, multi-disciplinary science review panel to advise it in the development of the watershed protection program.

The WPRC is currently in the process of comprehensively reviewing and evaluating existing Statewide regulatory and non-regulatory programs protecting anadromous salmonids and their habitat, as well as state and local restoration program efforts that are ongoing or proposed. An important outcome of this review is expected to be a compilation of management, implementation, and monitoring improvements that are needed to protect and conserve anadromous salmonids and their habitat. NMFS has reviewed early workproducts generated by this review process and will continue to participate in the review and the development of the watershed protection program.

NMFS is encouraged to see the State taking a comprehensive, watershed based approach to salmon management and restoration. However, the WPRC process is still in progress and a Watershed Protection Program has yet to be developed. The 1998 Memorandum of Agreement (MOA) signed by NMFS and the Secretary of Resources and Director of the CDFG (NMFS/California MOA 1998) ensures that NMFS will substantively participate in the development of this program, including participation on the scientific review panel that will advise the WPRC in the development of the Program. An important initial focus of this scientific review panel will be a review of California's forest practice regulations

and their implementation and enforcement to determine their adequacy.

To support implementation of the Governor's Executive Order and the WPRC's efforts to develop a Watershed Protection Program, CDFG began implementing a Watershed Initiative with \$3 million in SB 271 funds in FY 1997-1998. This funding is currently being obligated, together with a relatively limited amount of funds from other state sources (e.g., Proposition 70, Proposition 99, Commercial Salmon Stamp Account, Steelhead Catch-Restoration Card, and Wildlife Conservation Board), for coastal watershed projects through CDFG's Fishery Restoration Grants Program. CDFG expects to allocate at least \$1.3 million for watershed and riparian habitat restoration, up to \$425,000 for instream habitat restoration, and up to \$900,000 for watershed evaluation, assessment, planning, restoration project maintenance and monitoring, and a wide range of other activities. For FY 1998-1999 (beginning in July 1998), CDFG anticipates spending \$1.0 million for eight new positions to assist in watershed planning efforts and grant proposal development, and \$7.0 million on grants for actual projects.

In 1997, the California legislature enacted SB 271 which provides CDFG with \$43 million over six years for habitat restoration and watershed planning in coastal watersheds. This new funding allows CDFG to significantly expand its existing habitat restoration program in coastal watersheds, including KMP and Northern California steelhead ESUs. Senate Bill 271 requires that 87.5 percent of the \$43 million in funding be spent on project grants for habitat restoration, watershed planning and related programs, and permits CDFG to use the remainder for contract administration activities and biological support staff necessary to achieve the restoration objectives of the legislation. Senate Bill 271 also specifies that projects be given highest priority that, (1) emphasize the development of coordinated watershed improvement activities, (2) restore habitat for salmon and/or steelhead that are eligible for protection as listed or candidate species under the State or Federal ESA, and (3) treat the causes of fish habitat degradation. As part of this program, CDFG is currently funding \$3.0 million in new projects this year, and will begin funding \$7.0 million/year in new projects for five years, beginning in FY 1998-1999 (starting July 1998). In addition, CDFG will use SB 271 funding to support several new permanent

positions that will assist in administering the program and provide technical support in the development of watershed plans and habitat restoration projects.

In addition to the SB 271 funds, CDFG has committed to seeking additional funding in the FY 1998–1999 budget cycle for a new steelhead monitoring and adaptive management program (CDFG, 1998a and 1998b; NMFS/California MOA 1998). CDFG anticipates spending over \$1.6 million to hire over 30 person-years of staff for this program in FY 1998–1999.

The NMFS/California MOA (see discussion on NMFS/California MOA) provides additional assurances that the SB 271 program will provide these benefits. The MOA allows NMFS to serve as an ex-officio member of the Advisory Committee that will oversee implementation of SB 271, including the allocation funds. Furthermore, the MOA commits CDFG to direct a major portion of the new personnel and fiscal resources provided by SB 271 to watershed restoration efforts in these ESUs (NMFS/California MOA, 1998).

(3) Klamath Mountains Province and Northern California Strategic Plans

The state of California recently provided NMFS with strategic management plans specifically designed to address steelhead stocks in the KMP and Northern California ESUs on January 23, 1998, and February 5, 1998, respectively (CDFG, 1998a and 1998b). These strategic plans describe substantial changes in CDFG's management of recreational angling and steelhead hatchery programs, along with its monitoring, assessment, and adaptive management programs for steelhead in these two ESUs. In addition, both plans describe CDFG's ongoing efforts to protect and enhance steelhead habitat. These management measures are intended to provide immediate protection for steelhead populations in these ESUs, while longer-term measures are implemented to protect anadromous fish habitat on non-Federal lands through the State's Watershed Protection Program. The following is a description of the main components of the strategic management plans.

a. Harvest Measures

CDFG's strategic plans propose several harvest management actions that are designed to increase escapement of adult steelhead and reduce impacts on juvenile steelhead in the Northern California and KMP steelhead ESUs. NMFS (1998d) has reviewed and analyzed these measures and concludes that impacts to adult steelhead will be

greatly reduced as a result of these new measures. Impacts to juveniles will also be significantly reduced due to fishing closures in all steelhead rearing tributaries, expanded angling closures in mainstem areas through the end of May, and various gear and bait restrictions.

On February 6, 1998, the state of California's Fish and Game Commission (Commission) adopted emergency changes to the State's inland fishing regulations, which became effective on February 12, 1998. These regulation changes were intended to be consistent with the measures outlined in the KMP and Northern California strategic plans (CDFG, 1998a and 1998b). NMFS reviewed and evaluated these emergency regulation changes and determined that some of them did not adequately protect wild juvenile steelhead (NMFS, 1998e). The State and NMFS agreed to further modifications of the emergency regulations which were adopted by the Commission on March 6, 1998, as amendments to the emergency regulations. NMFS reviewed these modifications and concludes that they will reduce threats to steelhead and will help conserve the species in these ESUs (NMFS, 1998f).

b. Hatchery Measures

CDFG's strategic plans for KMP and Northern California steelhead identify a wide range of existing and new hatchery management measures that are intended to reduce the impacts of hatchery steelhead programs on wild steelhead populations in these ESUs. These measures include the following: (1) Release strategies that require a minimum 6" size and release at the hatchery; (2) marking all hatchery fish and conducting spawning surveys to assess the extent hatchery fish stray into natural spawning areas; (3) reductions in hatchery releases or other modifications of hatchery practices if significant straying of hatchery fish is found to occur; (4) a cap on hatchery production to current levels; regular health checks during each rearing cycle and the destruction of diseased fish that cannot be effectively treated; (5) review of the existing operating procedures for all cooperative rearing facilities permitted by the State; and (6) adoption of a requirement that all cooperative facilities develop and submit 5-year management plans to the State for approval.

NMFS has reviewed these existing and new hatchery management measures and concludes they will substantially reduce potential impacts to wild steelhead (NMFS, 1998d). However, NMFS continues to be

concerned with operations at the Mad River Hatchery since its winter-run steelhead broodstock is non-indigenous to the Mad River. To address this concern CDFG commits, in conjunction with NMFS, to, (1) undertake a comprehensive review of the hatchery program, including its stocking history and genetic analysis of current broodstock, and (2) develop a plan to eliminate any adverse impacts of hatchery operations on Northern California steelhead if necessary (NMFS/California MOA, 1998).

c. Steelhead Monitoring and Adaptive Management

In its strategic management plans for KMP and Northern California steelhead, CDFG commits to implement ongoing and expanded monitoring programs for assessing steelhead abundance in these ESUs (CDFG, 1998a and 1998b; NMFS/California MOA, 1998). In addition, CDFG commits to establishing a joint scientific and technical team including representatives from California, Oregon as appropriate, and NMFS to design appropriate detailed monitoring programs for steelhead (CDFG, 1998a and 1998b; NMFS/California MOA, 1998). NMFS considers these monitoring efforts essential given the uncertain status of steelhead populations in these ESUs, and believes that adequate State funding is critical to implementing this program.

Through the MOA (see discussion on NMFS/California MOA), CDFG further commits to seek adequate funding for this program (NMFS/California MOA, 1998). To this end, CDFG has submitted a budget change proposal for \$1.6 million to initiate the program in FY 1998–1999 (starting July 1, 1998). Aside from State funding commitments, NMFS commits to seek funding support for California's monitoring effort and to provide technical assistance in its design and implementation (NMFS/California MOA, 1998).

NMFS/California Memorandum of Agreement

NMFS evaluated a wide range of conservation efforts that California has adopted or is in the process of developing and concludes these efforts will provide substantial protections to KMP and Northern California steelhead populations. In particular, NMFS concludes that CDFG's harvest and hatchery management programs for KMP and Northern California steelhead will contribute to increasing escapement of adults, substantially reduce impacts on juveniles resulting in increased survival, and reduce adverse impacts of hatchery populations on wild fish

(NMFS 1998b and 1998d). In the near-term, NMFS expects these measures will contribute to improved survival and population stability for steelhead. Furthermore, CDFG's monitoring and adaptive management programs will provide the ability to assess the status of steelhead populations and their response to these management improvements. However, NMFS remains concerned that the State's habitat protection measures which are being evaluated as part of the WPRC's effort to develop a Watershed Protection Program and the watershed restoration program established by SB 271, are not presently adequate to secure properly functioning habitat conditions over the long-term. To address this concern, NMFS entered into a MOA with the WPRC, Resources Agency, and CDFG (NMFS/California MOA, 1998).

Under the terms of the MOA, NMFS will provide the State with guidance on its key programs that address habitat conditions affecting steelhead in the KMP and Northern California ESUs. Specifically, the MOA ensures that NMFS will substantially participate in (1) the ongoing development of the WPRC's Watershed Protection Program, including review of, and participation on, the multi-disciplinary scientific review panel that is an integral part of the WPRC program development, and (2) the implementation of the SB 271 watershed planning and habitat restoration program as an ex-officio member of the Advisory Committee.

The MOA commits NMFS and the State, in conjunction with the scientific review panel, to conduct an expedited review of California's forest practice rules and their implementation and enforcement, in order to assess their adequacy. In accordance with the provisions of the MOA, the State will make changes in implementation and/or enforcement of rules necessary to adequately conserve anadromous salmonids, including steelhead, by December 31, 1998. Also, by December 31, 1998, the State, in consultation with NMFS, will recommend any rule changes to the Board of Forestry that are necessary to adequately conserve anadromous salmonids. Because of the preponderance of private timber forested lands and timber harvest in the Northern California ESU, NMFS believes this is a critically important provision of the MOA.

In addition to these key provisions, the MOA also commits CDFG to: (1) Implement harvest and hatchery management changes contained in its strategic management plans for KMP and Northern California steelhead, including the emergency regulations

adopted as a result of those plans; (2) comply with existing Federal law including the adoption of State fishing regulations that are consistent with Federal protective regulations for listed coho salmon; (3) implement a monitoring and adaptive management program for KMP and Northern California steelhead; (4) direct a major portion of new personnel and fiscal resources resulting from SB 271 funding for FY 1998-1999 to watershed protection efforts in the Northern California ESU; and (5) seek funding in FY 1998-1999 for those activities identified in the State's Eel River Action Plan that have the most immediate and direct benefit to steelhead (NMFS/California MOA, 1998).

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 (e.g., Weitkamp *et al.*, 1995), NMFS has identified a number of factors that should be considered in evaluating the level of risk faced by an ESU, include the following: (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 in the proposed rule, published August 9, 1996 (61 FR 41541). 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 the status of these

steelhead ESUs is presented in the documents entitled "Status Review Update for Deferred and Candidate ESUs of West Coast Steelhead" (NMFS, 1997a) and "Status Review Update for Deferred ESUs of West Coast Steelhead: Hatchery Populations" (NMFS, 1998a). Copies of these documents are available upon request (see **ADDRESSES**).

(1) Lower Columbia River ESU

Based on its previous review of this ESU and on new data received during the deferral period, NMFS identified several major concerns for steelhead within this ESU. First, populations are at low abundance relative to historical levels, placing this ESU at risk due to random fluctuations in genetic and demographic parameters that are characteristic of small populations. Second, there have been almost universal, and in many cases dramatic, declines in steelhead abundance since the mid-1980s in both winter-run and summer-run steelhead runs. For example, on the basis of recent severe declines, WDFW has identified a change in the status designation for Wind River summer-run steelhead from "depressed" in 1992 to "critical" in 1997. In addition, WDFW recently determined that, of 21 wild winter-run and summer-run steelhead stocks on the northern side of this ESU, only two are healthy and the remaining 19 are depressed or believed to be depressed (WDF *et al.*, 1993). NMFS also notes the results from ODFW's extinction risk modeling, which predicts that the Kalama River summer-run steelhead have a greater than 5 percent probability of extinction within 100 years.

The primary exception to the declines within this ESU is the Toutle River winter-run steelhead stock, which has increased following decimation by the eruption of Mount St. Helens in 1980, but which remains at very low abundance. In some cases, chinook salmon populations in the same streams have not shown such dramatic declines. No clear explanation presently exists for these declines in steelhead, but not chinook salmon.

NMFS remains concerned about the widespread occurrence of hatchery fish in naturally spawning steelhead populations throughout this ESU. Recent estimates of the proportion of hatchery fish on the winter-run steelhead spawning grounds are over 80 percent in the Hood and Cowlitz Rivers, 45 percent in the Sandy, Clackamas, and Kalama Rivers, and approximately 75 percent for summer-run steelhead in the Kalama River. Only three out of 14 populations for which data exist have low estimates of percent hatchery fish in

natural escapements (i.e., 0 percent in the Washougal River summer steelhead run and Panther and Trout Creeks of the Wind River Basin). NMFS is unable to identify any natural populations of steelhead in this ESU that could be considered "healthy." Contributing to NMFS' concern is new genetic data from WDFW which indicate that some introgression has occurred between Puget Sound Chambers Creek Hatchery stock and wild steelhead in this ESU.

Summer-run steelhead are native to the Hood, Lewis, Washougal and Kalama Rivers in this ESU. However, summer-run fish have also been introduced into the Sandy and Clackamas Rivers. Furthermore, ODFW has estimated that naturally spawning winter-run steelhead populations have been negatively impacted by introductions of non-native summer-run steelhead due to interbreeding and/or competition (Chilcote, 1997). Recently implemented changes in hatchery release practices by WDFW and ODFW are generally positive; however, NMFS believes these changes have relatively minor mitigating effects on overall risks due to widespread artificial propagation and the history of stock transfers within this ESU.

Listing Determination

Based on available information, NMFS concludes that steelhead in the Lower Columbia ESU warrant listing as a threatened species. Recent abundance information indicates that steelhead populations have seriously declined within this ESU over the past several years. In the Washington portion of this ESU, steelhead stocks have reached historically low levels in several areas. Adding to this concern are recent assessments by WDFW that indicate the majority of steelhead stocks in this area are depressed or believed to be depressed.

Recent conservation planning efforts by the states of Washington and Oregon, along with those of industry, 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, 1998g). The OPSW, while substantially implemented and funded on the Oregon Coast, has not yet reached a similar level of development in inland areas.

Hatchery Populations Essential for the Recovery of the ESU

NMFS concludes that the late-spawning Cowlitz River Trout Hatchery

stock (winter-run), and the late-spawning Clackamas River ODFW stock #122 are not essential for recovery. At this time, sufficient numbers of wild steelhead remain in the ESU as a whole that can be used in recovery efforts. Therefore, inclusion of existing hatchery stocks in the listed ESU is not necessary at this time.

(2) Oregon Coast ESU

In the initial coastwide status review, NMFS concluded that the Oregon Coast ESU warranted listing as a threatened species based primarily on two factors: (1) Pronounced and nearly universal short- and long-term declines in abundance for populations throughout the ESU, and (2) substantial contribution of non-native hatchery fish to natural escapements in most basins. Abundance and trend estimates available at the time of the status review were based on angler catch through 1992. Subsequently, catch-and-release regulations for wild steelhead were implemented for most coastal streams, so angler catch no longer provides any information about wild steelhead abundance or trends. Unfortunately, ODFW has not initiated any comprehensive monitoring program to replace the angler catch data and as a result, NMFS is able to review only recent abundance data for three of the over 40 steelhead populations in this ESU.

The abundance of steelhead in the populations for which updated data exists (North Umpqua River summer- and winter-run-runs and Salmonberry River in the Nehalem River Basin) is moderate, and the trends are stable or increasing. However, these populations are among the few that showed relatively stable trends in the previous status review, so there is reason to believe they may not be representative of trends in the ESU as a whole (Chilcote, 1997). Spawner surveys from three coastal rivers (Trask, Wilson, and Nestucca Rivers) suggest mixed trends in abundance, but no expansions to total abundance estimates for these streams were provided. Of particular concern to NMFS is the absence of any recent information for a large number of streams that showed sharp declines in the initial coastwide status review.

Additional information provides some indication that the proportion of hatchery fish in natural escapements has declined in some of these coastal steelhead populations in recent years. A review of recent hatchery release information indicates that, compared with previous years, smolt releases have increased in four streams, decreased in four streams, and remained essentially

unchanged in four streams. However, release programs have also been terminated in four streams, so the net effect has been some reduction in the number of smolts released. In addition, ODFW reported the locations of hatchery releases have been and will be modified in an effort to reduce the incidence of strays. NMFS believes these recent changes in hatchery practices will reduce risks to wild steelhead. However, significant opportunities for deleterious effects remain as many programs continue to release non-native fish and ODFW data show that hatchery fish stray into and spawn in streams with no hatchery releases.

Listing Determination

Based on the best available information, NMFS concludes that steelhead in the Oregon Coast ESU do not presently warrant listing as a threatened species. Recently obtained abundance and hatchery data indicate that naturally spawned steelhead are at a lower risk of extinction than was concluded in the proposed rule. However, this conclusion is tempered by the fact that abundance information in this ESU is sparse and may not accurately portray the status of naturally spawned steelhead in this region.

Recently implemented conservation efforts have reduced the degree of risk facing this species. Specifically, habitat, hatchery and harvest, and monitoring aspects of the Oregon Plan will likely provide conservation benefits for this species. Furthermore, implementation of the NFP has reduced risks associated with habitat destruction on Federal lands within this ESU. However, NMFS remains concerned about the overall lack of abundance and trend information for this ESU. NMFS believes additional monitoring of this ESU is necessary before it is eliminated from ESA consideration. Therefore, NMFS concludes that this ESU warrants classification as a candidate species. NMFS will revisit the status of this ESU within the next 4 years to determine whether ESA protection is warranted.

Hatchery Populations Essential for the Recovery of the ESU

As described previously, NMFS concludes that the Oregon Coast ESU does not currently warrant listing. Therefore, no hatchery stocks are essential for recovery at this time.

(3) Klamath Mountains Province ESU

The KMP ESU includes a number of populations with different life history attributes and very different indicators of stock health. The Rogue River winter-

run steelhead run appears to be the most robust stock in the ESU, with relatively high abundance, stable long-term trends, and a relatively low hatchery contribution to overall abundance. The opposite pattern is exhibited in the Klamath River, where returns of winter-run steelhead to Iron Gate Hatchery have declined precipitously since 1990. In the Trinity River, returns of naturally produced fish have remained relatively stable since 1992, but in recent years there have also been a very high percentage of naturally spawning hatchery fish. Outside the Rogue and Klamath River Basins recent data on winter-run steelhead are very sparse. Based on angler catch data through 1992, most of the non-Rogue River populations in Oregon were declining, but more recent data are not available. Smolts monitoring in the Elk River indicated a relatively stable trend in smolts production over the period 1985–1996. The usefulness of this information is limited by a lack of smolts-adult survival for this population.

Available data indicate that summer-run steelhead populations in this ESU are relatively small and show almost universal declines. Extinction analyses by ODFW (Chilcote, 1997) identified the Middle Rogue River summer-run steelhead run as having a sensitive status (i.e., it had a greater than 5 percent probability of extinction in 100 years if survival rates are lower in the future than they have been over the last 30 years). Summer snorkel surveys in the Klamath River show consistent declines, but counts in the Trinity River are up in recent years relative to lows in the mid-1980s. This latter pattern is directly opposite to that found for most other steelhead populations coastwide, which generally showed peaks of abundance in the mid-1980s.

As with the Oregon Coast steelhead ESU described above, NMFS is concerned about the lack of recent abundance data for many steelhead populations in the KMP ESU. In particular, the lack of reliable abundance and trend information for winter-run steelhead in the California portion of this ESU may lead to some bias in overall risk assessment. Although the percentage of naturally spawning hatchery fish is relatively low to moderate in Oregon streams in this ESU and the number of hatchery fish planted is being reduced, the percentage of hatchery strays of unknown origin spawning naturally in unplanted Oregon streams remains a concern for Oregon streams. In California, risks associated with hatchery operations in the Klamath and Trinity Rivers are a

concern due to the long-term high abundance of naturally spawning hatchery fish in the Trinity River and the apparent inability of the Iron Gate Hatchery stock to maintain itself.

The states of Oregon and California expressed disagreement with the conclusions reached by NMFS in its KMP steelhead risk assessment. The States contend that NMFS gave inappropriate weight to snorkel surveys of summer-run steelhead in the Klamath and Trinity Rivers (California and Oregon, 1998). The States contend such snorkel surveys account for only one component of the entire spawning stock (spring migrating fish) and that such surveys are not representative of the status of winter-run steelhead in these areas. Furthermore, the States believe available information indicates recent improvements in summer- and winter-run steelhead status in the Rogue River, Oregon, and strong stock status in the Smith River, California.

Listing Determination

Based on available information, NMFS concludes that steelhead in the KMP ESU do not warrant listing as a threatened species at this time. In arriving at this determination, NMFS carefully considered the scientific conclusions of the BRT, existing and recently implemented State conservation efforts, and Federal management programs such as the NFP that have ameliorated risks to this species.

Available biological information indicates that some steelhead populations within this ESU are stable and increasing, such as winter-run steelhead in the Rogue River and summer-run steelhead in the Trinity River, while other populations, such as summer-run steelhead in the Middle Rogue River and winter-run steelhead in the Klamath River, are declining. Complicating NMFS' risk assessment is the lack of long-term data for steelhead populations within this ESU. Prior to 1992, angler catch data were available for streams in the Oregon portion of this ESU; however, these data have not been collected since then. Smolt monitoring conducted in the Elk River from 1985 to 1996 indicates stable trends in smolt production; however, the value of this data is limited since no studies of smolt to adult survival have been conducted for this population. In California, recent data on winter-run steelhead are sparse. Furthermore, summer snorkel survey information from the Klamath and Trinity Rivers may or may not reflect the actual status of steelhead within this region.

NMFS believes existing conservation efforts implemented by the states of Oregon and California have reduced threats to this species. NMFS has assessed recent harvest regulation changes implemented by the states of California and Oregon relating to juvenile and adult harvest in this ESU and concludes these regulations will contribute to steelhead conservation (NMFS, 1998b and 1998d). Monitoring efforts implemented and committed to by the states of California and Oregon should clarify the status of steelhead populations within this ESU and permit a more conclusive determination regarding the status of this ESU as a whole.

NMFS concludes that biological risks associated with habitat modification and degradation on Federal lands have declined in recent years with the implementation of the NFP, coupled with the consultation requirements associated with the listing of coho salmon as a threatened species in this region in 1997. While NMFS remains concerned about habitat conditions on non-Federal lands in this ESU, the majority of habitat in this area is under Federal management (about 64 percent). Efforts are currently underway in Oregon to improve habitat conditions on non-Federal lands. Recently implemented measures contained in the OPSW should improve habitat conditions for steelhead and other salmonids. In the California portion of this ESU, about 80 percent of the land area is under Federal management and is covered by the requirements of the NFP and ESA section 7 requirements for listed coho salmon. While NMFS remains concerned about the condition of non-Federal lands in this region, those areas comprise only 20 percent of this ESU in California. Furthermore, NMFS believes that provisions contained in the California/NMFS MOA will result in stronger State/Federal partnerships in these and other areas. NMFS views this MOA as an important step in developing long-term conservation efforts that will benefit not only KMP steelhead, but other anadromous salmonids as well.

Given the lack of reliable information concerning the status of steelhead in this ESU, and available information indicating that certain populations within this ESU may have declined substantially, NMFS remains concerned about the status of steelhead in this ESU as a whole. NMFS believes that additional monitoring of this ESU is necessary before it is eliminated from ESA consideration. Therefore, NMFS concludes that this ESU warrants as a candidate species. NMFS will revisit the

status of this ESU within the next 4 years to determine if ESA protection is warranted.

Hatchery Populations Essential for the Recovery of the ESU

As described above, NMFS concludes that the KMP ESU does not currently warrant listing. Therefore, no existing hatchery populations are essential for recovery of the ESU at this time.

(4) Northern California ESU

Steelhead abundance data available for this ESU are very limited, particularly for winter-run-run steelhead and NMFS' BRT identified this lack of data to be a risk factor for this ESU. The most complete data set available in this ESU is a time series of winter-run steelhead dam counts on the Eel River at Cape Horn Dam. Updated abundance data through 1997 show moderately declining long- and short-term trends in abundance; however, these data show a strong decline prior to 1970 and no significant trend thereafter. Additional winter-run steelhead data are available for Sweasy Dam on the Mad River which show a significant decline, but the data set ends in 1963. For the seven populations where recent trend data are available, the only runs showing recent increases in abundance in this ESU are relatively small populations of summer-run steelhead in the Mad River, which has high hatchery production, and winter-run steelhead in Prairie Creek whose increase may be due to increased monitoring or mitigation efforts. Abundance data in this ESU, particularly for winter-run steelhead populations are limited. The BRT noted, however, that steelhead are considered to be widely distributed throughout the region.

Risks associated with interactions between wild and hatchery steelhead in the Northern California ESU were also of concern to the BRT. Of particular concern to the BRT was the potentially deleterious impact to wild steelhead from past hatchery practices at the Mad River hatchery, primarily from transfers of non-indigenous Mad River hatchery fish to other streams in the Northern California ESU and the production of non-indigenous summer-run steelhead. These potentially deleterious hatchery practices ended for summer-run steelhead in 1996 (NMFS, 1998a).

Habitat degradation and other factors were also of concern to the BRT in its evaluation of the long-term risks to this ESU. Specific factors identified by the BRT were dams on the upper Eel and Mad Rivers, the likely existence of minor blockages throughout the ESU,

the continuing impacts of catastrophic flooding on the 1960s, and reductions in riparian and instream habitat and increased sedimentation from logging. The BRT also cited poaching of summer-run steelhead and predation from squawfish in the Eel River as factors for concern. NMFS' supplemental review of factors affecting west coast steelhead also identified additional factors including water diversion and extraction, agriculture, and mining (NMFS, 1996a).

Listing Determination

Based on available information, NMFS concludes that steelhead in the Northern California ESU do not warrant listing as a threatened species at this time. In arriving at this determination, NMFS carefully considered the scientific conclusions of the BRT, existing and recently implemented State conservation efforts, and Federal management programs such as the NFP that have ameliorated risks to this species.

The limited abundance data for steelhead in this ESU (Upper Eel River; Cape Horn Dam) indicate that some winter-run populations have declined, but most of this decline occurred prior to 1970. Since 1970, abundance has remained depressed relative to historic abundance levels (1930s and 1940s), but with no significant downward trend. Presence/absence information indicates that juvenile *O. mykiss* are broadly distributed throughout this ESU; however, the unknown origin of these juveniles makes this information difficult to interpret (i.e., observed juveniles may be hatchery steelhead, rainbow trout, or wild steelhead).

Based on the limited abundance data for steelhead in this ESU, the fact that recent data show mixed trends in abundance of steelhead of unknown origin, and the apparent widespread distribution of steelhead, NMFS concludes that there is a high degree of uncertainty about the current status of this ESU even though populations seem to be depressed. The lack of long-term and comprehensive monitoring data for steelhead in this ESU limits NMFS' ability to assess risk, a fact the BRT recognized as a significant problem.

NMFS analyzed the conservation measures and regulation changes described in CDFG's strategic management plan and concludes these measures will contribute to conservation of steelhead in this ESU (NMFS 1998b and 1998d). NMFS further concludes that the provisions in the NMFS/California MOA that provide for a comprehensive evaluation of the Mad River Hatchery and the

implementation of a plan to eliminate any adverse impacts will contribute to the conservation of this ESU. Finally, monitoring efforts implemented and committed to by CDFG, including the establishment of a scientific and technical team to develop and evaluate this program, is expected to clarify the status of steelhead populations in this ESU and permit a more conclusive determination regarding the status of this ESU as a whole.

Although NMFS concludes that harvest and hatchery management improvements implemented or soon to be implemented by the State will help conserve steelhead in this ESU, and that new monitoring will improve our understanding of the status of this ESU, habitat protection and restoration are essential to ensuring the long-term survival of steelhead in this ESU.

Federal conservation efforts in this ESU are relatively limited, but do address some important risk factors. About 20 percent of the habitat within this ESU is under Federal management, including Redwood National Park in the lower end of Redwood Creek, and portions of the Mendocino National Forest in the upper reaches of the Eel and Mad Rivers. Although these Federal lands are limited, NMFS concludes that biological risks associated with habitat modification and degradation on Federal lands have declined in this ESU due to implementation of the NFP, coupled with the completion of numerous section 7 consultations.

NMFS concludes that conservation measures addressing habitat conditions on non-Federal lands do not currently provide for properly functioning habitat conditions needed to conserve Northern California steelhead over the long-term. However, the State's coastal conservation efforts, including its strategic plan for Northern California steelhead, the WPRC's watershed protection program, and the SB 271 habitat restoration program, contain measures that NMFS concludes will improve habitat conditions on non-Federal lands within this ESU. Specifically, NMFS has carefully reviewed the SB 271 program and concludes that its implementation will help conserve steelhead in this ESU by promoting the development of watershed protection plans and the restoration of degraded habitat conditions (NMFS, 1998c). In addition, the NMFS/California MOA provides an assurance that these conservation efforts will be implemented.

Continued review of California's forest practice rules and their implementation and enforcement is critical to achieving properly

functioning habitat conditions for steelhead in this ESU since timber harvest on private lands is a major land management activity in this ESU. As discussed above, by December 31, 1998, under the terms of the NMFS/California MOA, the State will make changes in implementation and/or enforcement, as necessary, and will make recommendations to the Board of Forestry for rules changes if they are determined necessary to adequately conserve anadromous salmonids.

During the period the California forest practice rules and other State programs are under review through the WPRC program, NMFS believes harvest and hatchery measures that are currently being implemented will provide conservation benefits for steelhead in this ESU. However, if these State conservation processes and efforts are not fully implemented, or the provisions of the NMFS/California MOA are not fully met, NMFS will act promptly to change the ESA status of this ESU to the extent warranted.

Since the determination not to list the Northern California ESU relies heavily on the continued implementation of State conservation measures and implementation of the NMFS/California MOA, NMFS intends to review this listing determination no later than 4 years from the date this notice is published, or at any time sooner if substantive new information such as new biological data resulting from the State's monitoring program warrants consideration. Therefore, NMFS concludes that the Northern California ESU warrants classification as a candidate species under the ESA and will continue to monitor its status as well as the efficacy of the State's conservation measures and compliance with the MOA.

(5) Central Valley, California ESU

No new abundance data for the Central Valley was received since the ESU was proposed for listing as an endangered species in 1996. Therefore, NMFS' current risk assessment is based on the data available at the time of the coastwide status review, supplemented by new qualitative information about the presence of steelhead in the San Joaquin River Basin.

Various reports indicate that naturally spawning steelhead are distributed throughout a number of streams in the Central Valley region, but that they occur in small numbers. Furthermore, many populations are of non-native, mixed, or uncertain origin. In 1994, the recent total run size to the upper Sacramento River basin is probably less than 10,000 steelhead per year, and it is

believed that fewer than 2,000 of those fish were the result of natural production from native populations (based on counts at Red Bluff Diversion Dam). In particular, the status of native steelhead in the American River is in considerable doubt; new genetic data indicate that a sample of natural fish from the river and a sample of fish from the nearby Nimbus Hatchery are genetically similar to samples from the Eel River on the coast of Northern California. Presumably, this reflects a lasting influence from transfers of Eel River stock steelhead into the Nimbus Hatchery in a number of previous years.

Newly compiled information exists on the presence of steelhead in streams in the San Joaquin River Basin. This information indicates steelhead smolts occur in the lower San Joaquin and Stanislaus Rivers and adult steelhead occur in the Stanislaus and Merced Rivers. The only steelhead hatchery program operating in the San Joaquin River Basin is on the Mokelumne River, and no recent releases of juvenile steelhead have been made in other rivers in the basin; therefore, these results were viewed as an indication that at least some natural production of steelhead occurs in several streams in the San Joaquin River Basin.

The BRT identified long-term declines in abundance, small population sizes in the Sacramento River, and the high risk of interbreeding between hatchery and naturally spawned steelhead as major concerns for steelhead in this ESU. Addition, the BRT emphasized the significant loss of historic habitat, degradation of remaining habitat from water diversions, reduction in water quality and other factors, and the lack of monitoring data on abundance as other important risk factors for this ESU. NMFS (1996) review of factors for decline for this ESU noted many of these same factors as well as harvest impacts.

Listing Determination

Based on available information, NMFS concludes that steelhead in the Central Valley ESU warrant listing as a threatened species at this time. In arriving at this determination, NMFS carefully considered the scientific conclusions of the BRT, existing and recently implemented State conservation efforts, and Federal management programs such as the CVPIA that have ameliorated risks to this species.

Significant steps have been taken over the past two years in the Central Valley towards the largest ecological restoration project yet undertaken in the United States. The CALFED Program

and the CVPIA AFRP, in coordination with other Central Valley efforts, have implemented numerous habitat restoration actions that benefit Central Valley steelhead. The majority of these recent restoration actions address key factors for decline and emphasis has been placed on addressing tributary drainages with high potential for steelhead production. Additional actions during the past two years that benefit Central Valley steelhead include new efforts to enhance fisheries monitoring and conservation actions to address artificial propagation. Based on a review of these and other conservation efforts in the Central Valley, NMFS concludes that risks to Central Valley steelhead have diminished since the completion of the status review in 1996 (NMFS, 1998c).

NMFS is uncertain whether implementation of these Central Valley restoration programs are adequate to ensure long-term recovery of Central Valley steelhead at this time. However, the level of risk faced by the Central Valley steelhead ESU has diminished considerably since the completion of the August 1996 assessment by the NMFS biological review team. Considering the conservation actions implemented during the past 2 years and the direction of the Central Valley restoration efforts under the CALFED Program and CVPIA, NMFS concludes that Central Valley steelhead warrant listing as a threatened species at this time. If new information indicates a substantial change in the biological status of this ESU or the direction of restoration efforts in the Central Valley is judged to be inadequate, this determination will be reconsidered.

Hatchery Populations Essential for the Recovery of the ESU

NMFS concludes that neither the Coleman NFH nor Feather River Hatchery steelhead stocks are essential for recovery at present. While these stocks may be needed in future recovery programs, NMFS concludes that these stocks need to be analyzed more carefully before they are contemplated for use in recovery programs. In the case of the Coleman NFH stock, NMFS notes most of the original broodstock was taken at dams in the upper Sacramento River and that most historical production occurred above Shasta Dam. The Feather River Hatchery stock was founded from eggs taken from native Feather River steelhead that numbered no more than 100 to 200 wild fish at the time this stock originated. Based on the genetic clustering with Coleman NFH steelhead and wild steelhead in Deer and Mill Creeks, transplants of out-of-

basin steelhead into this system may not have been effective.

Determination

Section 3 of 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 listing determinations 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 results from its coastwide assessments, NMFS determines that, of the five ESUs proposed for listing on August 9, 1996, and deferred from final determinations on August 18, 1997, two ESUs are threatened (Lower Columbia River and Central Valley). NMFS further determines that, three ESUs that were previously proposed for listing (Oregon Coast, KMP, and Northern California ESUs) do not currently warrant listing; however, NMFS remains concerned about the status of these ESUs and therefore is classifying these ESUs as candidates for listing at this time. NMFS will reevaluate the status of the Oregon Coast, KMP, and Northern California ESUs within 4 years to determine whether listing is warranted. The geographic boundaries (i.e., the watersheds within which the members of the ESU spend their freshwater residence) for these ESUs are described under section Summary of ESUs Determinations.

In both ESUs identified as threatened, only naturally spawned populations of steelhead (and their progeny) residing below naturally and man-made impassable barriers (e.g., impassable water falls and dams) are listed. NMFS has examined the relationship between hatchery and natural populations of steelhead in these ESUs and has assessed whether any hatchery populations are essential for their recovery. At this time, no specific hatchery populations warrant listing.

NMFS' "Interim Policy on Artificial Propagation of Pacific Salmon Under the Endangered Species Act" (58 FR 17573, April 5, 1993) provides guidance on the treatment of hatchery stocks in the event of a listing. Under this policy, "progeny of fish from the listed species that are propagated artificially are considered part of the listed species and are protected under the ESA." In accordance with this interim NMFS policy, all progeny of listed steelhead

are themselves considered part of the listed species. Such progeny include those resulting from the mating of listed steelhead with non-listed hatchery stocks.

At this time, NMFS is listing only anadromous life forms of *O. mykiss*.

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 described below, 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). NMFS will issue shortly protective regulations pursuant to section 4(d) for the Lower Columbia River and Central Valley, California 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 affects 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 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,

FERC 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 to avoid or reduce impacts to steelhead and its habitat within the range of the listed ESU. It is important to note that the current 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.

There are likely to be Federal actions ongoing in the range of the listed ESUs at the time these listings become effective. Therefore, NMFS will review all ongoing actions that may affect the listed species with Federal agencies and will complete formal or informal consultations, if requested or necessary, for such actions pursuant to ESA section 7(a)(2).

Take Guidance

NMFS and FWS published in the **Federal Register** on July 1, 1994 (59 FR 34272), a policy that NMFS shall identify, to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the ESA. The intent of this policy is to increase public awareness of the effect of a listing on proposed and on-going activities within the species' range. 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 from the listed ESUs 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; and (2) federally funded or 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 a section 7 consultation has been completed, and when such an activity is conducted in accordance with any terms and conditions provided by NMFS in an incidental take statement accompanied by a biological opinion pursuant to section 7 of the ESA.

Activities that NMFS believes could potentially harm, injure or kill steelhead in the listed ESUs and result in a violation of section 9 include, but are not limited to the following: (1) Land-use activities that adversely affect steelhead habitat in this ESU (e.g.,

logging, grazing, farming, road construction in riparian areas, and areas susceptible to mass wasting and surface erosion); (2) destruction or alteration of steelhead habitat in the listed ESUs, such as removal of large woody debris and "sinker logs" 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 (e.g., sewage, oil, gasoline) into waters or riparian areas supporting listed steelhead; (4) violation of discharge permits; (5) pesticide applications; (6) interstate and foreign commerce of steelhead from the listed ESUs and import/export of steelhead from listed ESUs without an ESA permit, unless the fish were harvested pursuant to legal exception; (7) collecting or handling of steelhead from listed ESUs, (permits to conduct these activities are available for purposes of scientific research or to enhance the propagation or survival of the species); and (8) introduction of non-native species likely to prey on steelhead in these ESUs or displace them from their habitat. These lists are not exhaustive. They are intended to provide some examples of the types of activities that might or might not be considered by NMFS as constituting a take of west coast steelhead under the ESA and its regulations. Questions regarding whether specific activities will constitute a violation of this rule and general inquiries regarding prohibitions and permits should be directed to NMFS (see **ADDRESSES**).

Effective Date of Final Listing

Given the cultural, scientific, and recreational importance of this species, and the broad geographic range of these listings, NMFS recognizes that numerous parties may be affected by this listing. Therefore, to permit an orderly implementation of the consultation requirements associated with this action, this final listing will take effect 60 days after its publication in the **Federal Register**.

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 NFP (on Federal lands within the range of the northern spotted owl), PACFISH (on all additional Federal lands with anadromous salmonid populations), Oregon's Coastal Salmon Restoration Initiative, Washington's Lower Columbia River Salmon Conservation Initiative, overlapping protections from California's listing of coho salmon stocks in California under both the Federal and State ESAs, and implementation of California's Steelhead Management Plan. 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 to the extent that staff and resources permit, in the belief that they can play an important role in the recovery planning process.

Based on information presented in this final 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 less adversely affect 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 all three ESUs listed, steelhead habitat occurs and can be affected by activities on state, tribal, or private land. Agricultural, timber, and urban management activities 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 all state, tribal, and local governments, landowner representatives, and Federal and non-Federal biologists, participate and share the goal of restoring steelhead to the watersheds.

Critical Habitat

Section 4(b)(6)(C) of the ESA requires that, to the extent prudent, critical habitat be designated concurrently with the listing of a species unless such critical habitat is not determinable at that time. NMFS intends to propose critical habitat for all listed and proposed steelhead ESUs in a forthcoming **Federal Register** notice. (See 63 FR 11798 for proposed rule to list two ESUs of steelhead and 62 FR 43937 for final rule to list 5 ESUs of steelhead). Copies of these proposed and final rules are 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 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

when assessing 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 promulgating 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.

References

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

List of Subjects in 50 CFR Part 227

Endangered and threatened species, Exports, Imports, Marine mammals, Transportation.

Dated: March 13, 1998.

David L. Evans,
Deputy Assistant Administrator for Fisheries,
National Marine Fisheries Service.

For the reasons set forth in the preamble, 50 CFR part 227 is amended as follows:

PART 227—THREATENED FISH AND WILDLIFE

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

Authority: 16 U.S.C. 1531–1543; subpart B, § 227.12 also issued under 16 U.S.C. 1361 *et seq.*

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

§ 227.4 Enumeration of threatened species.

* * * * *

(m) *Lower Columbia River steelhead (Oncorhynchus mykiss)*. Includes all

naturally spawned populations of steelhead (and their progeny) in streams and tributaries to the Columbia River between the Cowlitz and Wind Rivers, Washington, inclusive, and the Willamette and Hood Rivers, Oregon, inclusive. Excluded are steelhead in the upper Willamette River Basin above Willamette Falls and steelhead from the Little and Big White Salmon Rivers in Washington;

(n) *Central Valley, California steelhead (Oncorhynchus mykiss)*. Includes all naturally spawned populations of steelhead (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries. Excluded are steelhead from San Francisco and San Pablo Bays and their tributaries.

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