2007 Federal Recovery Outline for the Distinct Population Segment of Northern California Steelhead

Prepared by

The National Marine Fisheries Service
Southwest Regional Office

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Disclaimer

This outline is meant to serve as an interim guidance document to outline recovery efforts, including recovery planning for the Northern California steelhead Distinct Population Segment, until a full recovery plan is developed and approved. A recovery outline is not subject to formal review but intended primarily for internal use by NMFS as a pre-planning document. This is not a regulatory document and the recommendations and statements found herein are non-binding and intended to guide, rather than require, actions. Nothing in this outline should be considered as a commitment or requirement for any governmental agency or member of the public. Formal public participation will be invited upon the release of the draft recovery plan for this Distinct Population Segment. However, any new information or comments that members of the public may wish to offer as a result of this recovery outline will be taken into consideration during the recovery planning process. Recovery planning has been initiated and recovery plans are targeted for completion by 2008. NMFS invites public participation in the planning process. Interested parties may contact Charlotte Ambrose, North Central California Coast Recovery Coordinator, 777 Sonoma Avenue, Room 325, Santa Rosa, CA 95404.

Introduction

Recovery Plan Purpose and Overview

The Federal Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.) mandates the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) to develop and implement plans for the conservation and survival of NMFS listed species, i.e., recovery plans. According to the NMFS Interim Recovery Planning Guidance (NMFS 2006):

> Recovery is the process by which listed species and their ecosystems are restored and their future safeguarded to the point that protections under the ESA are no longer needed. A variety of actions may be necessary to achieve the goal of recovery, such as the ecological restoration of habitat or implementation of conservation measures with stakeholders. However, without a plan to organize, coordinate and prioritize the many possible recovery actions, the effort may be inefficient or even ineffective. The recovery plan serves as a road map for species recovery – it lays out where we need to go and how best to get there.

According to section 4(f) of the ESA, recovery plans must contain: "(1) a description of such site-specific management actions as may be necessary to achieve the plan's goal for the conservation and survival of the species; (2) objective, measurable criteria which, when met, would result in the determination that the species be removed from the list; and (3) estimates of the time required and the cost to carry out those measures needed to achieve the plan's goal and to achieve intermediate steps toward that goal." Case law has re-affirmed these mandates with further clarification that management actions must be site-specific wherever feasible and recovery actions or criteria must link to threats, including changes in threats since listing. Recovery plans must explicitly identify all threats to a species and track (through objective measurable criteria) how each threat (through site-specific management actions) will be reduced or eliminated. This standard has been further emphasized by the United States Government Accounting Office in a 2006 report analyzing ESA recovery plans for Congress (GAO 2006).

Primarily, a recovery plan should do the following:

- Delineate those aspects of the species' biology, life history, and threats that are pertinent to its endangerment and recovery;
- Outline and justify a strategy to achieve recovery;
- Identify the actions necessary to achieve recovery of the species;
- Identify goals and criteria by which to measure the species' achievement of recovery; and
- Estimate the costs and time needed to reach recovery goals.

Recovery plans can also serve the following secondary functions:

- Serve as outreach tools regarding a species' endangerment and provide a suite of recovery actions most effective and efficient for achieving recovery for the species;
- Help potential cooperators and partners understand the rationale behind identified recovery actions, and aid them in figuring how they can facilitate the species' recovery;

- Serve as a tool for monitoring recovery activities; and,
- Offer support for grant applications of appropriations requests by identifying necessary recovery actions and their relative priority in the recovery process.

Recovery plans are guidance documents, not regulatory documents. The ESA clearly envisions recovery plans as the central organizing tool for guiding each species' recovery process. They should also guide Federal agencies in fulfilling their obligations under section 7(a)(1) of the ESA, which calls on all Federal agencies to "utilize their authorities in furtherance of the purposes of this [Act] by carrying out programs for the conservation of endangered species and threatened species...". In addition to outlining strictly proactive measures to achieve the species' recovery, the plans provide context and a framework for implementation of other provisions of the ESA with respect to a particular species, such as ESA section 7(a)(2) consultations on Federal agency activities or the development of ESA section 10(a)(1)(B) Habitat Conservation Plans (HCPs).

The development of a recovery outline is part of the pre-planning phase of recovery planning described in the NMFS Interim Recovery Planning Guidance (NMFS 2006). A recovery outline is intended primarily for internal use by NMFS as a pre-planning document that: (1) presents a preliminary conservation strategy to guide recovery actions in a systematic, cohesive manner until a recovery plan is available; and (2) provides a pre-planning framework for recovery plan development and decision-making.

The NMFS Southwest Region Protected Resources Division in Santa Rosa, California (SWR Santa Rosa), is responsible for facilitating the development of recovery plans for the following listed salmon Evolutionarily Significant Units (ESUs) and steelhead Distinct Population Segments (DPSs): Central California Coast steelhead (*Oncorhynchus mykiss*), Northern California steelhead (*Oncorhynchus mykiss*), California Coastal Chinook salmon (*Oncorhynchus tshawytscha*) and Central California Coast coho salmon *(Oncorhynchus kisutch*). Plans for the California Coastal Chinook salmon ESU and the Northern California steelhead DPS (NC steelhead DPS) will be developed in coordination with the Protected Resources Division in Arcata, California. The NMFS Strategic Plan for 2005 established a high priority focus on recovery plan development over the next five years. SWR Santa Rosa will proceed with recovery planning by developing draft ESU or DPS specific recovery plans in the following sequence: Central California Coast coho salmon ESU, Central California Coast steelhead DPS, California Coastal Chinook salmon ESU, and NC steelhead DPS. Each plan will contribute to a final multi-species recovery plan.

This recovery outline has been developed to guide the recovery planning process for the NC steelhead DPS and provide public notice of NMFS' intent to prepare a draft recovery plan.

General information

Species Name: Northern California steelhead (*Oncorhynchus mykiss*)

Listing Status: Threatened

Date Listed: June 7, 2000 (65 FR 36074), listing reconfirmed in a Final Rule published January 5, 2006 (71 FR 834).

Lead Field Office/Contact Biologist: North Central California Coast Recovery Domain (NCCC Domain), Charlotte Ambrose, Recovery Coordinator, NMFS, 777 Sonoma Avenue, Room 325, Santa Rosa, California 95404.

Recovery Status

In order to establish a recovery plan for a species, the current status of that species must be understood. The recovery status indicates how the species is doing at present and steps that must be taken for improvement. Three primary components are considered when determining status: (1) the biological requirements of the species, (2) the threats that negatively impact the species, and (3) the conservation efforts that positively impact the species. By assessing these three components, the recovery needs of the species become apparent. Thus, a recovery strategy with specific actions can be developed to address the identified needs.

Biological Assessment

The biological assessment provides information about the species' biology and ecology that may affect its recovery potential and needs. The species' life history, range (including critical habitat), population trends, and historical population structure are considered in this process.

Life History: The life history of steelhead is similar to most Pacific salmon in that they hatch in freshwater, migrate to the ocean, and return to freshwater to spawn. Within this cycle, however, steelhead exhibit greater variation than most anadromous fish in the time spent at each stage. Additionally, unlike salmonids, steelhead are iteroparous, meaning that not all adults die after spawning and, thus, some may spawn more than once. Steelhead are classified into two groups, known as "summer-run" and "winter-run" fish, based on the timing of return to freshwater and state of sexual maturity at that time. Summer-run steelhead are immature when they enter freshwater during spring and early summer. They spend several months maturing in freshwater (stream-maturing) prior to spawning. Winter-run steelhead are at or near sexual maturity when they enter freshwater (ocean-maturing) during late fall and winter. They spawn shortly after arrival in freshwater. The NC steelhead DPS includes summer and winter-run steelhead. The southern extent of the summer-run life history form occurs within this DPS at the Mattole River (Bjorkstedt *et al.* 2005). Another steelhead life history form that occurs in the NC steelhead DPS is known as the 'half-pounder'. This type of steelhead returns to freshwater in an immature state after a brief 2-3 month period in the ocean. Half-pounders overwinter in freshwater then return to the ocean in the spring. This unique steelhead life history form has only been observed in the Rogue and Klamath Rivers (of the Klamath Mountain Province steelhead DPS) and the Mad and Eel Rivers (of the NC steelhead DPS, Busby *et al.* 1996).

Range: The NC steelhead DPS includes all naturally spawned populations of steelhead in California coastal river basins from Redwood Creek (inclusive) in Humboldt County southward to the Russian River (exclusive, Figure 1) in Sonoma County. The DPS includes winter-run, summer-run, and half-pounder steelhead life history types (described above). Two artificial propagation programs are considered part of the DPS: the Yager Creek Hatchery and the North Fork Gualala River Hatchery (Gualala River Steelhead Project). Designated critical habitat for NC steelhead includes approximately 3,028 miles of stream habitat in Northern California and an additional 25 square miles of estuarine habitat, primarily in Humboldt Bay (September 2, 2005, 70 FR 52488).

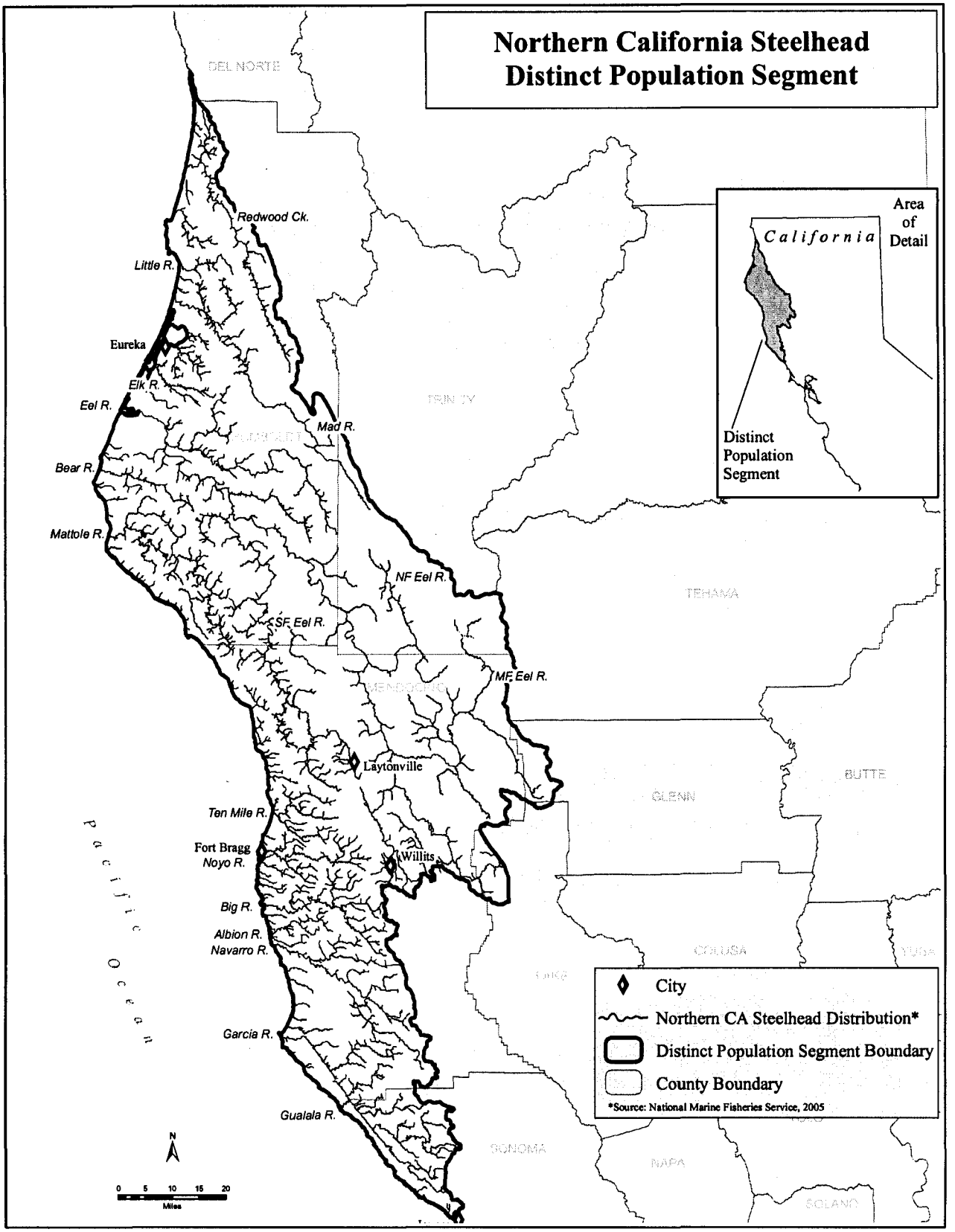

Figure 1. The Northern California steelhead DPS

***Critical Habitat*:** NMFS is responsible for designating critical habitat for species listed under its jurisdiction. In designating critical habitat, NMFS considers the following requirements of the species: (1) Space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, or rearing offspring; and, generally, (5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of the species (see 50 CFR 424.12(b)). In addition to these factors, NMFS focuses on the known physical and biological features (primary constituent elements) within the designated area that are essential to the conservation of the species and that may require special management considerations or protection. Section 4 of the ESA requires that economic, national security and other relevant impacts are taken into consideration when designating critical habitat. Additionally, section 7 of the ESA requires that Federal agencies (via consultation with NMFS) ensure any action they authorize, fund, or carry out will not result in the destruction or adverse modification of critical habitat.

The final critical habitat designation for the NC steelhead DPS was issued on September 2, 2005 (70 FR 52488). The specific primary constituent elements considered in the designation were freshwater spawning sites, freshwater rearing sites, freshwater migration corridors, estuarine areas, nearshore marine areas, and offshore marine areas. No unoccupied areas or offshore marine areas were designated as critical habitat. Approximately 3,148 miles of stream habitat and 25 square miles of estuarine habitat (primarily in Humboldt Bay) were considered for designation. Of those, the following were excluded: 120 stream miles due to economic impact and 21 stream miles due to overlap with Indian lands. Thus, approximately 3,007 miles of stream habitat and 25 square miles of estuarine habitat were ultimately designated as critical habitat for the NC steelhead DPS (70 FR 52488). The lateral extent of critical habitat in streams is the width of the stream defined by the ordinary high water line. For estuarine areas, it is the area inundated by extreme high tide.

***Status*:** Little historical abundance information exists for the naturally spawning portion of the NC steelhead DPS. A Biological Review Team (BRT) established by NMFS conducted a status review for West Coast steelhead and reported their conclusions in 1996 (Busby *et al.*). Although data for the NC steelhead DPS were limited, analysis by the BRT led to the following conclusions: (1) population abundances were low relative to historical estimates; (2) recent trends were downward; and (3) summer-run steelhead abundance was "very low" (Busby *et al.* 1996). The BRT was also concerned about the negative influences of hatchery stocks, especially from the Mad River Hatchery which is not considered part of the DPS. The Mad River Hatchery program was slated to be terminated in 2004 due to lack of funding, however public support kept the hatchery in operation until state funding was again secured for the 2006-2007 fiscal year.

In 2003, another BRT convened to analyze updated biological information for West Coast steelhead and reported their conclusions in 2005 (Good *et al.*). Updated time series of adult abundance data suggested a downward trend in summer-run steelhead in the Middle Fork Eel River, the largest extant population of summer steelhead in the NC steelhead DPS (Good *et al.* 2005). Similarly, analysis of new time series data for adult summer-run steelhead in the Mad River showed a downward trend.

Short time series of juvenile abundance for 10 independent populations within the NC steelhead DPS were also analyzed for the 2005 updated status review (Good *et al.* 2005). Data indicated upward trends in some populations and downward trends in others with an overall indication of population decline for the DPS.

Changes to regulations concerning sport fishing are likely to reduce the extinction risk for the NC steelhead DPS. The two artificial propagation programs that are part of the DPS are also thought to, "decrease risk to some degree by contributing to increased abundance, but have neutral or uncertain effects on productivity, spatial structure or diversity of the DPS" (71 FR 834 at 853). However, there is considerable uncertainty around this statement. In order to know that an artificial propagation program is decreasing extinction risk, information about the number of offspring produced by hatchery fish compared to fish spawning in the wild is required. Additionally, the effects of broodstock mining and genetic deviations would need to be considered. At present, data to address these issues do not exist. In accordance, the most recent status review for the species concluded that steelhead in the NC steelhead DPS remain likely to become endangered in the foreseeable future (Good et al. 2005).

Historical Population Structure and Viability: The ESA requires that recovery plans for listed species include objective, measurable criteria that are used to determine when species can be removed from the list. These criteria require both an explicit analysis of threats under the five listing factors and an evaluation of population or demographic parameters. The NCCC Domain Technical Recovery Team (TRT) is responsible for developing biological viability criteria to satisfy the latter portion of the recovery criteria requirement. As a first step in this process, the TRT has estimated the historical population structure of the NC steelhead DPS (Bjorkstedt *et al.* 2005). Biological viability criteria are expected from the TRT in 2007.

Three types of information were used to characterize the historical population structure of the NC steelhead DPS: geographic, genetic, and environmental. Analysis of these factors informed the identification of individual subpopulations within the DPS and their potential role in the structure and persistence of the DPS. Thus, each individual population was assigned to a population type:

- "Functionally Independent Populations" were those that historically had a high likelihood of persisting over 100-year time scales due to their population size and relatively independent dynamics (i.e., negligible influence of migrants from neighboring populations on extinction risk).
- "Potentially Independent Populations" were those that had a high likelihood of persisting in isolation over 100-year time scales due to large population size, but were likely too strongly influenced by immigration from other populations to exhibit independent dynamics.
- "Dependent Populations" were those that had a substantial likelihood of going extinct within a 100-year time period in isolation due to smaller population size, but receive sufficient immigration to alter their dynamics and reduce extinction risk.

The TRT identified 29 "functionally independent", 22 "potentially independent", and at least 67 "dependent" populations[1] in the NC steelhead DPS (Bjorkstedt *et al.* 2005; with modifications

[1] Dependent streams with less than 1.6 Intrinsic Potential-km are not listed by the TRT in the historical population structure of the NC steelhead DPS.

described in Spence *et al.* In preparation). Analysis of genetic data provided support for, and aided in interpretation of population type assignment.

Beyond delineating individual populations, the TRT also identified diversity strata for the DPS by grouping together watersheds that share similar environmental characteristics. Thus, each diversity stratum identified represents a group of populations that evolved under similar conditions. The development of viability criteria at the diversity strata scale should, therefore, account for the environmental, phenotypic, and genetic diversity that historically existed. The TRT defined five diversity strata in the NC steelhead DPS. Within three of these strata, populations were further subdivided according to life history type, with summer-run and winter-run populations constituting distinct substrata (Bjorkstedt *et al.* 2005; with modification described in Spence *et al.* In preparation).

Understanding the historical population structure allows insight into the conditions under which the DPS persisted in the long term. If the populations within the DPS diverge from the historical structure, the viability of the DPS as a whole may decrease. Thus, the historical structure provides a benchmark at which we have high confidence that the DPS persisted over long periods of time; the farther the DPS departs from this historical structure, the greater our uncertainty about whether the DPS is likely to persist. This provides a biologically relevant context for recovery planning (Bjorkstedt *et al.* 2005) by guiding restoration and monitoring toward those populations most essential for successful recovery of the DPS.

Threats Assessment

A thorough understanding of the threats that impact a species is vital for recovery. Four components are considered in assessing threats. First, threats that existed at the time the species was listed must be addressed to allow a logical link between the listing package and the recovery plan. Second, changes that have occurred to those threats must be documented. Third, any new threats that have arisen since the time of listing need to be described to be sure all threats to the species are considered. Fourth, an analysis of threats must be conducted to formally determine the threats that are limiting recovery of the species.

***Threats Identified at the Time of Listing*:** Section 4(a)(1) of the ESA and NMFS implementing regulations (50 CFR part 424) direct NMFS to determine if a species is threatened or endangered through one or a combination of the following factors: (A) the present or threatened destruction, modification or curtailment of habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) inadequacy of existing regulatory mechanisms; or (E) other natural or man-made factors affecting its continued existence. Through the regulatory process, the Secretary of Commerce has determined that the NC steelhead DPS is a threatened species based on a combination of factors as outlined in the final rule (71 FR 834; January 5, 2006), and summarized below. The destruction and modification of habitat, and natural and man-made factors were identified as the primary causes for the decline of NC steelhead DPS (NMFS 1996a).

A. <u>Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range:</u> Land use activities associated with logging, road construction, urban development, mining, agriculture, ranching, and recreation have resulted in the loss, degradation, simplification, and fragmentation of NC steelhead habitat, and caused resulting declines in NC steelhead populations. Associated

impacts of these activities include: alteration of stream bank and channel morphology; alteration of ambient stream water temperatures; degradation of water quality; elimination of spawning and rearing habitats; fragmentation of available habitats; elimination of downstream recruitment of spawning gravels and large woody debris; removal of riparian vegetation resulting in increased stream bank erosion; and increased sedimentation input into spawning and rearing areas (NMFS 1996a). Additionally, poor land use practices can exacerbate the impact of flooding, as was the case in 1964 when substantial degradation to steelhead habitat occurred throughout northern California (Busby *et al.* 1996).

Water storage, withdrawal, conveyance, and diversions for agriculture, flood control, domestic, and hydropower purposes have greatly reduced or eliminated historically accessible habitat, and have also resulted in increased direct mortality of adult and juvenile steelhead. Scott Dam on the Eel River has hindered access to historical spawning and rearing habitat and has altered the natural flow regime within this basin (NMFS 1996a). Modification of natural flow regimes has resulted in increased water temperatures, changes in fish community structures, and depleted flow. Depleted flow affects migration, spawning, and rearing, and reduces the flushing of sediments from spawning gravels, recruitment of gravel and transport of large woody debris (NMFS 1996a).

Studies indicate that in most western states, about 80 to 90 percent of the historical riparian habitat has been eliminated. In California riparian wetland habitat has been reduced by over 90 percent (Dahl 1990; Jensen *et al.* 1990; Barbour *et al.* 1991; as cited in NMFS 1996a). The condition of the remaining riparian, wetland, and estuarine habitats for NC steelhead is largely degraded, and at continued risk of loss or further degradation. The destruction or modification of riparian, wetland, and estuarine areas has resulted in the loss of important rearing and migration habitats.

Summation: The loss and degradation of natural habitat and flow conditions are primary driving factors in the decline of NC steelhead DPS. Mining, agriculture, logging, habitat blockages, and water diversion/extraction are all identified as factors affecting this DPS.

B. <u>Overutilization for Commercial, Recreational, Scientific, or Educational Purposes:</u> There are no commercial fisheries for steelhead in the ocean, and they are only rarely taken there in fisheries targeting other species. High seas driftnet fishing has been implicated as a past cause for decline of west coast steelhead, but cannot solely account for the large reductions that have occurred over the last several decades (NMFS 1996a).

Steelhead fishing has been, and continues to be, an important recreational fishery in freshwater. Recreational fishing for hatchery-origin steelhead is extremely popular. These fisheries are highly selective, and only visibly marked surplus hatchery-origin fish may be harvested. In most streams where fishing is allowed a bag limit exists of one hatchery steelhead during the winter months. On the Mad River there is a bag limit of two hatchery steelhead. At catch and release streams, all wild steelhead must be released without further harm. Mortality rates for naturally spawned fish that are caught and released in these fisheries are presumed to be low, though actual rates are unknown. There are significant restrictions on gear used for angling. Although the closure of many areas, and institution of catch-and-release elsewhere, is expected to reduce extinction risk for the DPS, this risk reduction cannot be estimated with existing data. Poaching of summer-run fish is considered a problem in watersheds in the northern range of the DPS

(NMFS 1996a). During periods of decreased habitat availability (drought or low flow conditions), recreational fisheries may have a greater impact on wild steelhead.

Collection for scientific research and education programs has had little or no impact on NC steelhead populations (NMFS 1996a). Take of this nature is controlled by the issuance and conditioning of scientific collection permits by the California Department of Fish and Game (CDFG) and NMFS. Most of the permits are issued to environmental consultants, Federal resource agencies, and universities.

Summation: Although not a primary driving factor in the decline of NC steelhead DPS, lack of data on abundance and trends for this population coupled with unknown mortality associated with catch and release recreational fishing, make this threat a concern for recovery. Poaching has also been identified as a factor affecting this DPS.

C. Disease or Predation: Infectious disease can influence adult and juvenile steelhead survival. Fish are exposed to numerous bacterial, protozoan, viral, and parasitic organisms in spawning and rearing areas, hatcheries, migratory routes, and the marine environment. Specific diseases that are present and known to affect steelhead include bacterial kidney disease, ceratomyxosis, columnaris, furunculosis, infectious hematopoietic necrosis, redmouth and black spot disease, erythrocytic inclusion body syndrome, and whirling disease. In general, very little current or historical information exists to quantify changes in infection levels and mortality rates attributable to these diseases. However, studies have shown that naturally spawned fish tend to be less susceptible to pathogens than hatchery-reared fish. Steelhead have co-evolved with specific communities of these organisms, but the widespread use of artificial propagation has introduced exotic organisms not historically present in a particular watershed. Habitat conditions such as low water flows, high temperatures, and artificial passage routes through man-made barriers can exacerbate susceptibility to infectious diseases.

Introductions of non-native species and habitat modifications have resulted in increased predator populations and predator success rates. For example, introduced Sacramento pikeminnow, whose populations have flourished with warmer water conditions, are known to consume juvenile salmonids throughout the Eel River Basin. Numerous avian species also prey upon juveniles, and success is often improved by water development activities. Predation by pinnipeds (harbor seals and California sea lions in particular) is a concern due to the increase in their numbers along the Pacific Coast combined with the dwindling run sizes of NC steelhead. However, steelhead have historically coexisted with pinnipeds and, while predation could potentially suppress recovery, it is unlikely that it has caused the low numbers of fish existing today.

Summation: Although not considered one of the primary driving factors for the decline of the NC steelhead DPS, predation is acknowledged as a factor affecting this DPS.

D. Inadequacy of Existing Regulatory Mechanisms: A variety of regulatory mechanisms and protective efforts existed at the time of listing with potential positive effects for abundance and survival of the NC steelhead DPS. These efforts are described in one of two sections in the listing package: (1) within the summary of factors affecting the species section, or (2) within the evaluation of protective efforts section. We have chosen to summarize the efforts here to allow changes since listing to be logically tracked in a manner similar to changes in other threats.

Federal Efforts
NMFS conducts ESA section 7 consultations with federal action agencies that authorize, fund, or carry out projects in the range of NC steelhead DPS. NMFS provides technical assistance to federal, state, and local agencies, and to private landowners for projects occurring throughout the range of NC steelhead. NMFS staff evaluates impacts to NC steelhead from a wide variety of projects including: irrigation and water diversion, timber harvest, watershed restoration, fish passage, gravel mining, grazing, and transportation projects. Consultations and technical assistance have improved designs, and avoided or minimized adverse impacts to steelhead and their habitats throughout the NC steelhead DPS. One important consultation was the Potter Valley Project (which included the Eel River).

NMFS is also engaged in an ongoing effort to assist in the development of HCPs for state and private lands under section 10 of the ESA. Important HCPs are discussed in the section describing non-federal efforts below.

The Northwest Forest Plan (NFP) is a federal management policy with potential benefits for NC steelhead DPS. Under the NFP the US Forest Service and the Bureau of Land Management have made efforts to reduce adverse effects to aquatic and riparian dependent species including steelhead in the range of the Northern spotted owl. The most significant element of the NFP for anadromous fish is its Aquatic Conservation Strategy, which includes an objective for salmon habitat conservation. Implementation of the NFP on the Six Rivers and Mendocino National Forests lands will provide some benefits to the NC steelhead DPS.

The Redwood National and State Parks have developed several plans to help protect and enhance anadromous salmonids habitats including the Redwood National and State Park General Management Plan and the Redwood National Park Final Management Plan. Humboldt Redwoods State Park has also developed a State Park General Plan with one of its goals being to restore and protect terrestrial and aquatic habitats and species in accordance with federal and state laws.

Non-Federal Efforts
Adequacy of State conservation measures for the following programs were considered: (1) development of the State's Watershed Protection Program; (2) implementation of the CDFG strategic management plan and (3) implementation of the 1998 NMFS/California Memorandum of Agreement (MOA). Implementation of the 1998 MOA was a critical factor in NMFS' decision not to list the NC steelhead DPS as threatened (63 FR 13347). The MOA committed the State to, among other things, implement measures in the State Strategic Plan for Steelhead, implement the California Watershed Protection Program and review and revise (if found necessary) the State's Forest Practice Rules (FPRs). By 2000, the State had implemented many of the provisions of the MOA except those specific to the FPRs.

FPRs regulate management of non-federal timberlands in California and are promulgated by a governor-appointed California Board of Forestry (BOF). Because of the preponderance of private timber land and timber harvest activity in the NC steelhead DPS, revisions to the FPRs were critically important. Per the MOA, a scientific review panel was appointed to undertake an independent review of the FPRs. In 1999 the panel found, and presented to the BOF, findings that FPRs, including their implementation through the timber review process, do not ensure

protection of anadromous salmonid habitats and populations. To address these shortcomings, and as specified in the MOA, the California Resources Agency and CalEPA jointly presented the BOF with a proposed rule change package in July 1999. Following several months of public review, the BOF took no action on the package in October 1999, thereby precluding any possibility of implementing improvements in California's FPRs by January 1, 2000, as the State committed to do in the MOA. The California State Legislature, gave special authority to the BOF to adopt new rules twice during the year 2000 for the specific purpose of revising the State's FPRs to meet ESA requirements for salmonids. On March 14, 2000 the BOF adopted only a subset of rule changes. Full implementation of these provisions was critically important.

The Pacific Coastal Salmon Recovery Program allows NMFS to provide annual grants (from the Pacific Coastal Salmon Recovery Fund) to the State of California to assist salmon recovery efforts in coastal watersheds from the Oregon border to southern California.

The CDFG has funded a development effort for a statewide coastal salmonid monitoring program. Due to the lack of comprehensive abundance and trend data for coastal salmonids, a coastal monitoring program is critical to assessing the viability of listed ESUs and DPSs.

CDFG has developed the Salmon and Steelhead Stock Management Policy to address the issues associated with introduction of non-native steelhead via hatcheries. Although this policy has the intent to classify each steelhead stream according to its genetic source and degree of integrity, this has not yet been accomplished.

California's Steelhead Management Plan focuses on restoration of native and naturally produced steelhead stocks. This plan presents a historical account of the decline of California's steelhead populations and identifies needed restoration measures.

Resource Conservation Districts along the northern California coast allow the agricultural community to voluntarily address and correct management practices that impact ESA listed salmonids and their habitats. These Districts can assist landowners in developing and implementing best management practices that are protective of salmonids.

The North Coast Regional Water Quality Control Board is in the process of updating its north coast basin plan, which will establish water quality standards for all of the northern California rivers and streams. These plans will also incorporate newly developed Total Maximum Daily Load standards that are being developed for those water bodies that are listed as impaired under section 303(d) of the Clean Water Act. These plans will likely help reduce human impacts to the aquatic environments and thus protect ESA listed salmonids.

The Rangeland Management Advisory Committee has developed a management plan for inclusion in the state's Non-point Source Management Plan. The purpose of the plan is to maintain and improve the quality and associated beneficial uses of surface water that passes through rangeland resources.

Long-term sustained gravel mining plans have been, or are being, developed by Humboldt and Mendocino County, which comprise a substantial portion of the range of the NC steelhead DPS.

A Multi-County Memorandum of Agreement between five counties in northern California (including Humboldt, and Mendocino) has been developed to create a standardized county routine road maintenance manual to assist in the protection of ESA listed species and their habitat. This manual includes best management practices for reducing impacts to listed species and the aquatic environment, a five-county inventorying and prioritization of all fish passage barriers associated with county roads, annual training of road crews and county planners, and a monitoring framework for adaptive management.

The Sotoyome Resource Conservation District has developed a voluntary certification program (Fish Friendly Farming) for grape growers in Sonoma and Mendocino Counties who implement land management practices that decrease soil erosion and sediment delivery to streams. FishNet 4C is a multi-county group (including Mendocino and Sonoma) that coordinates county efforts such as road maintenance, fish barrier assessment and removal, riparian and grading ordinances, erosion control, implementation of bioengineering projects and the development of guidelines for public works departments that enhance or protect salmonid habitat.

Local watershed councils and other groups throughout California have successfully developed restoration plans and have worked to implement habitat restoration projects that are expected to contribute to the conservation of listed salmonids ESUs. In the range of the NC steelhead DPS these groups include: the Humboldt Bay Watershed Advisory Committee for Humboldt Bay watersheds; the Eel River Watershed Improvement Group that focuses on the lower Eel River, the Van Duzen River and South Fork Eel River; the Mainstem Eel River Group; the Yager/Van Duzen Environmental Stewards; the Eel River Salmon Restoration Project; and the Mattole Restoration Council and Group (Mattole River).

Many other sub-watershed groups, landowners, environmental groups, and non-profit organizations throughout the range of NC steelhead are conducting habitat restoration and planning efforts that may contribute to the conservation of the species.

There are three important HCPs that could contribute to the conservation of the NC Steelhead DPS. The Pacific Lumber Company HCP has a goal of achieving or trending towards properly functioning aquatic habitat conditions. An HCP is under development with Green Diamond Resource Company for its industrial timber operations in northern California. The Humboldt Bay Municipal Water District HCP prevents river dewatering due to water district operations.

Private lands, and public lands not administered by the Federal government are addressed by the California Rangeland Water Quality Management Program, which seeks to improve water quality via non-point source pollution reduction requirements. The program enhances the landowners' abilities to manage their land in a way that protects water quality standards necessary for the survival and recovery of listed salmonids (65 FR 36074 at 36086).

Other efforts by the State of California that could provide benefits to steelhead are outlined in 'Steelhead Conservation Efforts: a supplement to the notice of determination for west coast steelhead under the Endangered Species Act' (NMFS 1996b) and the proposed listings for West Coast Salmonids of June 14, 2004 (69 FR 33102 at 33143).

Summation: Existing State and Federal conservation measures collectively fail to provide for the attainment of properly functioning habitat conditions necessary to provide for long term protection and conservation.

E. Other Natural and Man-made Factors Affecting the Species' Continued Existence: Variability in natural environmental conditions has both masked and exacerbated the problems associated with degraded and altered riverine and estuarine habitats. Floods and persistent drought conditions have reduced already limited spawning, rearing, and migration habitats. El Niño events and periods of unfavorable ocean conditions can threaten the survival of steelhead populations at low numbers due to degradation of estuarine habitats and reduced food availability in coastal and estuarine areas (NMFS 1996a).

Three artificial propagation programs may impact the NC Steelhead DPS: Mad River Hatchery, Yager Creek Hatchery and North Fork Gualala River Hatchery. The Mad River Hatchery is not considered part of the DPS. Hatchery introductions may pose risks to natural steelhead populations via competition, genetic introgression, and disease transmission. CDFG has adopted policies designed to ensure that the use of artificial propagation is conducted in a manner consistent with the conservation and recovery of natural, indigenous steelhead stocks. The careful monitoring and management of current programs, and the scrutiny of proposed programs, is necessary to minimize impacts on listed species.

The implementation of improved hatchery management measures may reduce the impact of hatchery introductions. All hatchery steelhead must be marked.

Summation: Variable environmental conditions may exacerbate problems resulting from habitat degradation. Artificial propagation programs may contribute to future abundance and improved spatial structure of the DPS, but out-planting benefits are uncertain.

***Changes to the Threats since Listing*:** This section documents changes that have occurred to the threats listed above since the time of listing. In some cases, threats may have been removed via restoration or management practices, and may no longer need to be considered for recovery actions. A thorough review of changes to the five listing factors will be done during recovery plan development. Examples of some changes by listing factor are provided here:

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes: A global moratorium on high seas driftnet fishing (via a United Nations resolution implemented by the U.S. in 1992) has reduced the impact of this threat to salmonids.

D. Inadequacy of Existing Regulatory Mechanisms: Due to budgetary constraints, the statewide coastal monitoring program funded by CDFG is not functioning at present.

***New Threats since Listing*:** Threats that were not present, or were not documented, at the time of listing may exist for the NC steelhead DPS. A thorough review of these new threats will be included in development of the recovery plan.

***Analysis of Threats*:** A formal analysis of threats will be conducted for the NC steelhead DPS to identify the key factors that are limiting the recovery of the species. The analysis will be conducted using a ranking matrix developed by The Nature Conservancy (TNC). This method

breaks each identified threat down into two components, stress and source of stress, then ranks each component for a number of different criteria. As a result of these rankings a final score is established for each threat. The scores allow recovery actions to be prioritized by those threats whose alleviation will have the greatest impact on recovery.

Conservation Assessment

The objective of a conservation assessment is to identify the steps that have been or are being taken to address the conservation needs of the species of interest. By considering the existing conservation actions and comparing them with threats identified in the previous section, the types of recovery actions that still need to occur should become clear. Two types of conservation assessments are conducted for listing and recovery:

1. Protective efforts: evaluated pursuant to the "Policy for Evaluation of Conservation Efforts When Making Listing Decisions" (68 FR 15100; March 28, 2003)
2. Conservation assessment: conducted pursuant to the Interim Recovery Planning Guidance (NMFS 2006)

Protective efforts: Under section 4(b)(1)(A) of the ESA, protective efforts are required to be assessed during listing decisions. Federal agencies are required to review the status of the species using the best scientific and commercial data available after taking into account efforts being made to protect the species. The efficacy of existing efforts must consider the following: (1) substantive, protective and conservation elements; (2) degree of certainty efforts will be implemented; and (3) presence of monitoring provisions that determine effectiveness and permit adaptive management. Protective efforts for the NC steelhead DPS were evaluated in the original listing (65 FR 36074; June 7, 2000), and again when the threatened listing was re-affirmed (71 FR 834; January 5, 2006). Protective efforts for steelhead range in scope from regional strategies to local watershed initiatives. Major efforts are summarized above in the 'Threats under the Five Listing Factors at Time of Listing' section. Efforts are described in greater detail in "Steelhead Conservation Efforts: a supplement to the notice of determination for west coast steelhead under the Endangered Species Act" (NMFS 1996b) and the proposed listings for West Coast Salmonids (69 FR 33102 at 33143; June 14, 2004). Of particular importance to the NC steelhead DPS were the following State of California conservation efforts: (1) development of the State's Watershed Protection Program; (2) implementation of the CDFG strategic management plan; and (3) implementation of the 1998 NMFS/California MOA.

Conservation assessments: For recovery outlines and plans a conservation assessment is conducted pursuant to the Interim Recovery Planning Guidance (NMFS 2006). While correlating with protective efforts evaluated during listing, this assessment should provide additional information, including conservation efforts that have occurred since listing. Conservation efforts can include agreements that remain in place since listing, recovery-related research, habitat protection measures, measures implemented pursuant to ESA sections 4, 7, and 10 and other regulatory mechanisms, and the work of active conservation constituencies.

The full suite of conservation efforts will be evaluated and documented during recovery plan development. While not a complete assessment, we provide here some of the ongoing efforts NMFS believes contribute to the conservation of the NC steelhead DPS by abating or reducing threats outlined above.

- NMFS has addressed NC steelhead DPS needs through biological opinions, participation in HCPs (e.g., the Green Diamond Resource Company HCP, signed on June 12, 2007 (72 FR 36672), which will help secure conservation efforts for a portion of the DPS and costal basins to the north of the existing Pacific Lumber company HCP), and interagency technical work groups. These consultations have improved or minimized adverse impacts to listed salmonids and their habitats by improving habitat and fish passage conditions.

- NMFS has developed guidelines for bank stabilization, road maintenance, instream gravel mining, maintaining instream flows to protect salmonids below water diversions, fish screening, salmonid passage at stream crossings, summer dam mitigation and impacts, and timber harvest activities.

- Numerous federal, state and local conservation programs include:

    - Pacific Coastal Salmon Recovery Funding Grant Program
    - EPA Total Maximum Daily Load Programs
    - State Coho Recovery Plan (efforts to recover coho will provide benefits to steelhead)
    - State Steelhead Restoration and Management Plan for California
    - CalFish and California Fish Passage Forum
    - Improvements in Hatchery Programs
    - Fish Friendly Farming Program
    - 5 Counties Salmon and Roads Program
    - Green Diamond Resource Company HCP
    - FishNet 4C

Recovery Status Summary
The recovery status of the NC steelhead DPS will be determined from a synthesis of the three assessments provided above: biological, threats, and conservation. Understanding the current status provides a basis for determining the direction that recovery actions will take.

Recovering the DPS will likely require a mix of improved access to historically available habitat and restoration of degraded habitat. Historical distribution provides an understanding of how an altered DPS may or may not persist in the future. Current distribution provides an understanding of how to efficiently safeguard the existence of the DPS.

From the determination of the status of the NC steelhead DPS, a recovery strategy with specific actions will be developed. While current data are deficient and research and monitoring will be critical to recovery, NMFS believes the following outlines key needs:

Freshwater spawning sites:
- have good water quality and quantity; and
- have substrate for spawning, incubation, and larval development.

Freshwater rearing sites:
- have good water quality and quantity and floodplain connectivity to maintain habitat conditions;
- have forage for juvenile development; and

- have natural cover to provide refuge (such as submerged and overhanging large wood, log jams, beaver dams, aquatic vegetation, large rocks or boulders, side channels, undercut banks, etc.).

Freshwater migration corridors:

- are unobstructed;
- have good water quality and quantity;
- have natural cover to provide refuge to support juvenile and adult mobility and survival; and
- afford safe passage conditions for migrations.

Estuarine areas:

- are unobstructed;
- have good water quality and quantity, with salinity conditions to support juvenile and adult physiological transitions between freshwater and saltwater;
- have natural cover to provide refuge to support migrations among systems; and
- have forage for juvenile and adult migrating fish.

Nearshore marine areas:

- are unobstructed;
- have good water quality and quantity conditions;
- have forage to support growth and maturation of fish; and
- have natural cover to provide refuge.

Offshore marine areas:

- have good water quality conditions; and
- have forage to support growth and maturation.

Preliminary Recovery Strategy

The preliminary recovery strategy describes initial decisions that have been made about how to recover the species. First, a Priority Number was determined for the species to rank its priority for recovery plan development and implementation. Next, a Recovery Vision Statement was made to clearly define the overall goal of recovery. Priority tasks were then developed which, if implemented, would improve the species' potential for recovery. Finally, a preliminary action plan for NMFS was written. This plan outlines potential coordination efforts between divisions within NMFS and with other entities involved in salmonid management and recovery. This is a starting point from which the full recovery strategy for the species will be developed.

Recovery Priority Number

A priority number of "5" was assigned to the NC steelhead DPS in accordance with the Recovery Priority Guidelines (55 FR 24296, Section B; June 15, 1990). Priority Numbers are determined from a matrix comparing the species' magnitude of threat of extinction, recovery potential, and potential for conflict with economic activities. Priority Numbers range from 1 – 12 with lower numbers receiving higher priority for recovery plan development and implementation. Ranking for NC steelhead is based on a moderate degree of threat, a high recovery potential, and anticipated conflict with development projects or other economic activity.

The moderate degree of threat determination is based on the most recent status review of steelhead populations in California which in which the Biological Review Team (BRT) concluded that for the NC steelhead DPS abundance and productivity were of some concern and spatial structure and diversity were of lower concern (Good *et al.* 2005). Uncertainty resulting from lack of data was considered by the BRT to be a source of risk, especially for the winter run portion of this DPS. Due to the lack of data, the recovery priority number will be reevaluated in the future as the recovery plan is drafted. A high potential for recovery exists for the NC steelhead DPS because the majority of the DPS is not presently in urban environments. Imminent land use changes and economic activities (timber, ranching, and agriculture) result in anticipated conflict with conservation needs of NC steelhead.

Recovery Vision Statement

Recovery and delisting of the NC steelhead DPS is the desired outcome of recovery planning. An outcome that evolves from a "... process by which listed species and their ecosystems are restored and their future safeguarded to the point that protections under the ESA are no longer needed" (NMFS 2006). The process shall include the development and implementation of a recovery plan that provides for the conservation and survival of the NC steelhead DPS pursuant to section 4(f)(1) of the ESA as well as the most recent judicial and policy guidance.

All methods and procedures which are necessary shall be used to bring NC steelhead to the point at which the measures pursuant to the ESA are no longer necessary. Such methods and procedures shall result in the establishment and maintenance of a viable population of NC steelhead via increased abundance, improved population growth rate, increased population spatial structure and greater genetic/life history diversity.

Priority Tasks to Improve Potential for Recovery

Priority actions that would improve the species' potential for recovery have been identified for the NC steelhead DPS. These include, but are not limited to, the following:

- Conduct and improve research and monitoring on distribution, status and trends and improve understanding of life-stage survival.
- Complete development of a threats assessment.
- Continue to hold public outreach workshops to develop integrated recovery criteria and recovery actions based on the threats assessment.
- Develop more effective and efficient federal and state mechanisms to correct already documented threats to listed salmonids.
- Educate the water-user community regarding actions and priorities.
- Improve understanding of life-stage survival at the population scale through focused research and monitoring.
- Provide outreach to federal action agencies regarding ESA section 7(a)(1) and the carrying out of programs that conserve and recover federally listed salmonids.
- Collaborate with interested public, state and federal resource agencies, local agencies and special interest groups in identifying and implementing early actions in priority watersheds and streams, informed by TRT and Critical Habitat Analytical Review Team reports.
- Encourage enforcement, improved performance and needed revisions to pertinent state and local rules and regulations such as Forest Practice Rules, Urban Stormwater Permits, County General Plans, and others.

- Protect and restore watershed and estuarine habitat complexity and connectivity.
- Improve freshwater habitat quantity and quality.
- Implement freshwater habitat restoration techniques as part of construction activities (*e.g.*, set-back levees/bank stabilization/levee repair and maintenance, re-introduction of large woody debris, erosion control, etc.).
- Reduce and control impacts of urbanization through education, outreach, partnerships, and protective regulations.
- Balance water supply and allocation with needs and priorities for fish recovery through water rights programs, identification and designation of fully appropriated watersheds, development of passive diversion devices and/or offstream storage, elimination of illegal water diversions, and improved criteria for water drafting, storage and dam operations.
- In priority watersheds, work with groups and counties involved with agriculture, instream gravel mining, and forestry practices.
- In priority watersheds, work with state/county/city planning, regulations (*e.g.*, riparian and grading ordinances) and state/county road maintenance programs.
- Screen water diversion structures in priority anadromous fish-bearing streams, replace outdated septic systems, and improve wastewater management.
- Promote concept of multi-use/recycling of water to increase water supply (*e.g.*, use of tertiary treated wastewater for golf courses and other appropriate uses).
- Facilitate identification and treatment of point and non-point source pollution from wastewater, agricultural practices and urban environments to priority streams.
- Encourage modification to channel and flood control maintenance practices, where appropriate, to increase stream and riparian complexity.
- Encourage recruitment and maintenance of native riparian areas by removal of livestock and incentives for tree and vegetation retention.
- Improve harvest management strategies and reform hatchery practices where necessary.

Preliminary Recovery Action Plan
The goal of the action plan is to ensure NMFS is fulfilling its obligation under the ESA to conserve and recover NC steelhead. NMFS shall focus primarily on linking and coordinating ESA programs to recovery planning, and developing stronger, more collaborative partnerships with other entities whose decisions affect steelhead recovery.

Outline of NMFS Actions ~ Coordinating ESA Programs with Recovery Planning:
1) Streamline programs through programmatic strategies and develop best management practices that can be provided to federal, state, county or city governments, and private landowners for the benefit of salmonid habitat.

- Programmatic Strategies include, but are not limited to, State of California Road Maintenance Manual, Bank Stabilization Guidelines, Gravel Mining Guidelines *(completed 2004)*, Ground Water Management Guidelines, Water Development and Rights Policies, Minimum Flow Policies for dry seasons to ensure appropriate water temperatures and conditions *(completed 2004)*, Timber Harvest Guidelines *(expected completion date December 2007)*, Stream Flow Protection Standards (Public Resources Code, Division 10, Section 10800 – 11005) and active participation in County General Plan updates.

2) Streamline ESA section 7 processes by providing direction for NMFS consultations.
   - Heighten awareness of NMFS consultation staff to important populations within the NC steelhead DPS and threats to be addressed.
   - Utilize programmatic approaches where appropriate.
   - Prioritize participation in interagency collaborative efforts seeking to streamline project implementation while contributing to the conservation strategy for the NC steelhead DPS.

3) Identify types of ESA section 7 conservation measures that may be appropriate on priority watersheds.
   - Utilize opportunities for enhancement of existing habitat conditions.
   - Incorporate priority recovery actions in consultations.

4) Coordinate recovery planning efforts with other NMFS programs (*e.g.*, those conducted by Southwest Fisheries Science Center, Sustainable Fisheries, and/or Habitat Conservation) through GIS and database development.
   - Develop tracking systems for: (a)incidental take permits; (b) annual ESA section 10 reporting; and (c) implementation and effectiveness of NMFS recommendations (*e.g.*, terms and conditions from ESA section 7 consultations).
   - Develop a formal process that outlines and prioritizes research needs to improve decision-making under the ESA and allow for a streamlined permitting process for applications that address priorities.
   - Develop and implement effectiveness/performance monitoring to ensure actions contribute to recovery and facilitate adaptive management, and assure research and monitoring priorities are being addressed and met.

5) Create higher levels of efficiency and scientific rigor to work products by continued development of a spatially-linked (geo-referenced) relational database (i.e., CalFish) that provides the best available information on the distribution, abundance and productivity of NC steelhead.

6) Collaborate with the Office of Law Enforcement during recovery plan development.

Outline of Actions ~ Coordination and Outreach:

1) Promote communication and collaboration between different divisions, offices, laboratories, Science Centers, Regions and the Pacific Fisheries Management Council for steelhead recovery planning.

2) Assess how the State Coho Salmon Recovery Plan and identified implementation actions can be used to facilitate coordination and outreach for NC steelhead (i.e., through education and increased awareness about conservation of salmonids).

3) Coordinate and improve communication with federal and state agencies regarding joint management responsibilities as well as diverging responsibilities such as water supply management and allocations, and competing species' needs.

4) Conduct outreach to promote NC steelhead recovery.

- Develop specific outreach plan for the public, stakeholders and private organizations (*e.g.*, Sustainable Conservation, Natural Resources Conservation Service, Nature Conservancy, etc.).

5) Provide technical information about NC steelhead life history, species needs and viable salmonid population structure to federal, state, regional planning organizations, county governments, special interest groups and non-governmental organizations to include in their project designs, general plans, watershed plans, etc.

6) Promote NMFS' student internship programs and other types of student appointments to recruit individuals with desired backgrounds, education and training.

Pre-planning Decisions

These are decisions that have been made about the development of the recovery plan for NC steelhead DPS.

Product: Draft Recovery Plan for NC steelhead DPS.

Scope of Recovery Effort:
Species _X_ Recovery Unit __ Multi-Species __ Ecosystem __

Recovery Plan Preparation: NMFS, Southwest Region Protected Resources Division, will initiate the preparation of a draft recovery plan for NC steelhead (using the most recent Recovery Planning Guidance from July 2006) concurrent with the TRT distribution of the draft reports being prepared for the salmon ESUs and steelhead DPSs in the North Central California Coast Recovery Domain. Primary authorship of the Recovery Plan will be the responsibility of NMFS staff. Outreach by NMFS to state, federal and private partners will be central to the recovery effort, as well as engaging with other interested parties through participation in public workshops, public review, and peer review.

Administrative Record: The administrative record will be housed in the Santa Rosa office.

Outreach and Stakeholder Participation: While NMFS is responsible for developing recovery plans, the plans will have a greater likelihood of success if they are developed in partnership with entities that have the responsibility and authority to implement recovery actions. Therefore, NMFS initiated outreach efforts in 2006 to facilitate communication and collaboration with the public, stakeholders and agencies.

Anticipated Recovery Planning Actions:

(1) NMFS has appointed a TRT for the North Central California Coast Recovery Domain comprised of scientists tasked to develop biological viability criteria for the two ESUs and two DPSs in the Domain, including the NC steelhead DPS. The final products from the TRT are expected in mid 2007.

(2) NMFS Protected Resources Division (PRD) staff are currently developing a strategy to initiate the development of the recovery plan per the most recent Federal guidelines to include

inter- and intra-agency coordination and collaboration on regulatory operations, public input and plan development.

(3) NMFS PRD will coordinate with NMFS Habitat Conservation Division, NMFS Sustainable Fisheries Division, NOAA Restoration Center, Southwest Fisheries Science Center, NMFS Northwest Region and other NOAA cooperators to ensure consistency and effectiveness in the recovery plan development and implementation.

(4) NMFS PRD will work with all parties to evaluate best management practices and existing regulatory programs for integration into recovery planning.

(5) NMFS PRD has initiated outreach efforts to ensure the highest level of public participation in the process. Outreach will consist of website updates on recovery plan process, public meetings, development of educational materials and public input on the draft recovery plan.

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