

Designation of Critical Habitat for 7  
Salmon and Steelhead ESUs in California

*DRAFT* 4(b)(2) Report

*National Marine Fisheries Service (NMFS) – Southwest Region*

October 2004

# I. INTRODUCTION

## Background

This report contains NMFS, Southwest Region's recommendations for designating critical habitat under section 4 of the Endangered Species Act (ESA) for 7 salmon and steelhead species in California that are listed as threatened or endangered under the ESA. The report describes the methods used, process followed, and conclusions reached for each step leading to the recommendation.

Over the past decade, NMFS has listed 26 distinct population segments, or evolutionarily significant units (ESU), of Pacific salmon and steelhead in Oregon, Washington, Idaho and California. Collectively, these ESUs occupy thousands of miles of streams in watersheds covering more than 250 thousand square miles. In 2000, NMFS designated critical habitat for 19 of the listed ESUs (65 FR 7764, February 16, 2000), including 6 of the ESUs addressed in this report (California Coastal chinook, Central California Coast O. mykiss, South-Central California Coast O. mykiss, Southern California O. mykiss, Central Valley spring-run chinook, and Central Valley O. mykiss). These designations were challenged in court on a number of grounds. NMFS entered into a consent decree resolving these claims and pursuant to court order the designations were vacated. Following remand, NMFS received 60-day notice of intent to sue letters from environmental groups, for not having designations in place for these 19 ESUs, as well as the Northern California O. mykiss ESU which was listed after February 2000. The agency entered into a consent decree with the environmental groups establishing a schedule for completing new designations in 2003. In June 2004 the consent decree was modified and a new schedule for completing the designations was agreed upon. This new schedule requires the agency to publish proposed critical habitat designations for the 7 ESUs in California by November 30, 2004. This report addresses the proposed designations for these 7 ESUs.

## Statutory and Regulatory Requirements

The recommendations contained in this report were formulated consistent with statutory requirements and agency regulations. This section reviews the relevant statutory and regulatory provisions that guided the Region's development of recommendations.

### Congressional findings and purposes of the Act emphasize habitat conservation

In section 1 of the ESA, "Findings," (16 U.S.C. 1531(a)(1)) Congress declared that:

Various species of fish, wildlife and plants in the United States have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation.

Section 2 of the ESA sets forth the purposes of the Act, beginning with habitat protection:

The purposes of this chapter are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in subsection (a) of this section.

“Critical Habitat” is specifically defined

Section 3(5)(A) of the ESA (16 U.S.C. 1532 (5)) defines critical habitat in some detail.

(5)(A) The term “critical habitat” for a threatened or endangered species means –

(i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 1533 of this title, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and

(ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 1533 of this title, upon a determination by the Secretary that such areas are essential for the conservation of the species.

(B) Critical habitat may be established for those species now listed as threatened or endangered species for which no critical habitat has heretofore been established as set forth in subparagraph (A) of this paragraph.

(C) Except in those circumstances determined by the Secretary, critical habitat shall not include the entire geographical area which can be occupied by the threatened or endangered species.

“Conservation” is specifically defined

Section 3(3) of the Act also defines conservation (16 U.S.C. 1532(3)):

(3) The terms "conserve", "conserving", and "conservation" mean to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary.

Certain military lands are not subject to designation

In 2003 Congress amended section 4(b)(1) of the ESA to limit the designation of land controlled by the Department of Defense (National Defense Authorization Act, P.L. No. 108-136):

The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a),

if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.

Specific deadlines limit the time and information available for making designations

Section 4(a)(3) requires NMFS to make critical habitat designations concurrently with the listing determination, to the maximum extent prudent and determinable:

(3) The Secretary, by regulation promulgated in accordance with subsection (b) of this section and to the maximum extent prudent and determinable -

(A) shall, concurrently with making a determination under paragraph (1) that a species is an endangered species or a threatened species, designate any habitat of such species which is then considered to be critical habitat

The time for designating critical habitat may be extended pursuant to section 4(b)(6)(C), but not by more than 12 months:

(C) A final regulation designating critical habitat of an endangered species or a threatened species shall be published concurrently with the final regulation implementing the determination that such species is endangered or threatened, unless the Secretary deems that -

(i) it is essential to the conservation of such species that the regulation implementing such determination be promptly published; or

(ii) critical habitat of such species is not then determinable, in which case the Secretary, with respect to the proposed regulation to designate such habitat, may extend the one-year period specified in subparagraph (A) by not more than one additional year, but not later than the close of such additional year the Secretary must publish a final regulation, based on such data as may be available at that time, designating, to the maximum extent prudent, such habitat.

Impacts of designation must be considered and areas may be excluded

Specific areas that fall within the definition of critical habitat are not automatically designated as critical habitat. Section 4(b)(2) (16 U.S.C. 1533(b)(1)(A)) requires the Secretary to first consider the impact of designation and permits the Secretary to exclude areas from designation under certain circumstance. Exclusion is not required for any areas.

The Secretary shall designate critical habitat, and make revisions thereto, under subsection (a)(3) of this section on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security and any other relevant impact, of specifying any particular area as critical habitat. The Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned.

Federal agencies must ensure their actions do not destroy or adversely modify critical habitat

Once critical habitat is designated, section 7(a)(2) provides that federal agencies must ensure any actions they authorize, fund or carry out are not likely to result in the destruction or adverse modification of critical habitat (16 U.S.C. 1536(a)(2)). Section 7 also requires federal agencies to ensure such actions do not jeopardize the continued existence of the listed species:

Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available.

Authority to designate critical habitat is delegated to NMFS

The authority to designate critical habitat, including the authority to consider the impacts of designation, the authority to weigh those impacts against the benefit of designation, and the authority to exclude particular areas, has been delegated to the Assistant Administrator of the National Marine Fisheries Service. NOAA Organization Handbook, Transmittal #34 (May 31, 1993).

Joint regulations govern designation

Aside from restating the statutory definitions and criteria, joint regulations of the Services elaborate on those physical and biological features essential for conservation, and set standards for the delineation of critical habitat.

50 CFR Sec. 424.12 Criteria for designating critical habitat.

(b) In determining what areas are critical habitat, the Secretary shall consider those physical and biological features that are essential to the conservation of a given species and that may require special management considerations or protection. Such requirements include, but are not limited to the following:

- (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, rearing of offspring, germination, or seed dispersal; and generally;
- (5) Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

When considering the designation of critical habitat, the Secretary shall focus on the principal biological or physical constituent elements within the defined area that are essential to the conservation of the species. Known primary constituent elements shall be listed with the critical habitat description. Primary constituent elements may include, but are not limited to, the following: roost sites, nesting grounds, spawning sites, feeding sites, seasonal wetland or dryland, water quality or quantity, host species or plant pollinator, geological formation, vegetation type, tide, and specific soil types.

(c) Each critical habitat will be defined by specific limits using reference points and lines as found on standard topographic maps of the area. Each area will be referenced to the State(s), county(ies), or other local governmental units within which all or part of the critical habitat is located. Unless otherwise indicated within the critical habitat descriptions, the names of the State(s) and county(ies) are provided for information only and do not constitute the boundaries of the area. Ephemeral reference points (e.g., trees, sand bars) shall not be used in defining critical habitat.

(d) When several habitats, each satisfying the requirements for designation as critical habitat, are located in proximity to one another, an inclusive area may be designated as critical habitat.

Definitions in the regulations elaborate on the meaning of “special management considerations or protection.”

(j) Special management considerations or protection means any methods or procedures useful in protecting physical and biological features of the environment for the conservation of listed species.

Sec. 424.02

## II. APPROACH TO DESIGNATING CRITICAL HABITAT

### Statutory Context

At different times in the history of the ESA, Congress has emphasized both the importance of habitat protection to species conservation and the importance of agency restraint in designating areas as “critical” habitat. Congress emphasized the importance of habitat in species conservation in several provisions of the ESA. The findings recognize that extinctions have resulted from economic growth and development. Among the purposes of the Act is providing “a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.” In determining whether a species is threatened or endangered, the Secretary is to consider the current or threatened destruction of its habitat. Federal agencies are prohibited from destroying or adversely modifying critical habitat. Section 5 of the Act authorizes the Secretary of Interior to acquire land for species conservation and section 10 requires the development of “habitat conservation plans” for the issuance of incidental take permits.

At the same time, the ESA requires a degree of rigor in identifying areas that qualify as critical habitat. The definition of critical habitat specifies separate criteria for designating occupied areas and unoccupied areas. Occupied areas are critical habitat if they contain physical or biological features essential to the species’ conservation, and

those features may require special management considerations or protection. Unoccupied areas may be designated only upon a determination that the area itself is essential to conservation. (The House Merchant Marine Committee expressed its view “that the Secretary should be exceedingly circumspect in the designation of critical habitat outside of the presently occupied area of the species” (H.R. Rep. 95-1625).) Finally, the Services are not to designate all of the geographical area that can be occupied by the species, absent a determination that the entire area is essential to conservation.

In addition to the tension between an emphasis on the importance of habitat and a rigorous definition of critical habitat, the ESA’s provisions for designating critical habitat stand out from the listing provisions of the Act in requiring the Services to consider factors in addition to species conservation. Before they may designate an area as critical habitat, the Services must consider the economic impact, impact to national security, and any other relevant impact of the designation. The Services have the discretion to exclude an area from designation if they determine the benefits of exclusion (that is, avoiding the impact that would result from designation), outweigh the benefits of designation (that is, the benefits to species conservation). The Service’s discretion is limited in that they may not exclude an area from designation if exclusion will result in extinction of the species.

The Services must observe the details of the statutory definition of critical habitat; must use the best available science; must consider the impacts of the designation on economic, national security, and other interests; and may weigh the benefit to species conservation resulting from designation against the benefits of exclusion. All of this must be done within specific statutory timeframes, based upon the best information available during those timeframes, and with public notice and participation. In designating critical habitat for Pacific salmon and steelhead, we sought an approach that adhered to these statutory requirements and ultimately exercised the agency’s discretionary authority within the framework of agency and administration policy.

#### Steps in the Approach to Designating Critical Habitat

The approach we adopted in applying sections 3(5)(A) and 4(b)(2) involved these steps:

- 1) Identify specific areas meeting the definition of critical habitat
- 2) Conduct a Section 4(b)(2) analysis
  - A) determine the benefit of designation;
  - B) determine the impact of designation;
  - C) determine whether benefits of exclusion outweigh benefits of designation;
  - D) determine whether the cumulative effect of the recommended exclusions will result in extinction of the species.

#### A) Identify Areas Meeting the Definition of Critical Habitat

##### In General

Areas that meet the definition of critical habitat include: 1) occupied areas that contain physical or biological features essential for conservation, which may require special management considerations or protection, and 2) unoccupied areas if the area itself is essential to conservation. In a separate draft report, the Southwest Region has documented its conclusions regarding which specific areas meet the definition of critical habitat and are therefore eligible for designation (NMFS 2004b). Pursuant to section 3(5)(A), the first task was to determine “the geographical area occupied by the species at the time of listing.” The State of California did not have detailed geographic distribution information on these ESUs to carry out this task, and therefore, the Southwest Region needed to develop this information independently. NMFS biologists from the Southwest Region were organized into teams that compiled and organized extensive information regarding the stream reaches occupied by the 7 salmon and steelhead ESUs in California and we believe this information represents the best available data on species distribution and habitat use. This information was used to produce ESU distribution maps on a freshwater hydrography scale of 1:100,000 using standard Geographic Information System (GIS) software. We also developed latitude-longitude identifiers for the end-points of the occupied stream reaches. We submitted these distribution maps and other information to the California Department of Fish and Game for review and comment so that the information could be re-fined based on co-manager input.

Relying on the biology and life history of each species, we determined the physical or biological habitat features essential for their conservation. We identified these features in an Advance Notice of Proposed Rulemaking (ANPR) (68 FR 55926, Sept. 29, 2003) and asked for public comment. We did not receive comments specifically addressing the physical and biological features. During our deliberations since publication of the ANPR, we have consulted with teams of federal biologists (described below) and will propose some minor modifications to the physical and biological features essential to conservation.

Again relying on the biology and population structure of the species, and the characteristics of the habitat it occupies, we identified “specific areas” in which these physical or biological features could be found. To delineate specific areas and organize biological and economic data, we used standard watershed units called hydrologic subareas (HSAs) which are defined as part of the CALWATER 2.2 watershed delineation framework used by the State of California. Within the boundaries of any HSA watershed, there are stream reaches not occupied by the species. Land areas within the watershed boundaries are also generally not “occupied” by the species (though certain areas such as flood plains or side channels may be occupied at some times of some years). We used the HSA watershed boundaries as a basis for aggregating occupied stream reaches, for purposes of delineating “specific” areas.

We used the same HSA watershed aggregation of stream reaches to allow us to analyze the impacts of designating a “particular area,” as required by section 4(b)(2). Section 3(5) defines critical habitat as being “specific areas” while section 4(b)(2) requires the agency to consider certain factors before designating “particular areas.” Depending on the biology of the species, the characteristics of its habitat, and the nature of the impacts of designation, “specific” areas might be different from, or the same as, “particular” areas. For this designation, we used the same delineation for both – the occupied stream reaches within a watershed – and refer to that delineation as a “habitat area.”

Critical habitat review and evaluation teams comprised of Southwest Region fisheries biologists then examined each HSA within each ESU to determine whether the stream reaches occupied by the species contained the physical or biological features previously identified as essential for conservation. The teams also determined whether, consistent with the regulatory definition (50 C.F.R. 402.02 (j)), there were “any methods or procedures useful in protecting physical and biological features.” To do so the teams determined whether there were management activities in the area that represented threats to the physical or biological features. Management activities were considered broadly as any human activities with the potential to alter the land or water. Where management activities exist that threaten these features, and changes in such activities would be useful in protecting the identified habitat features, we concluded that the features in that area “may require special management considerations or protection.”

Aside from occupied areas containing essential features that may require special management, the definition of critical habitat includes unoccupied areas if the Services determine that the area itself is essential for conservation. We asked the teams of fisheries biologists to make an assessment of whether or not there were any unoccupied areas within the historical range of the ESUs that may be essential to their conservation. Where information was available to make this determination, the teams indicated those areas not occupied at the time of listing that they believed are essential for conservation. In some cases, the teams did not have information available that would allow them to draw that conclusion. The teams nevertheless identified some areas they believe may be determined essential through future recovery planning efforts. The Federal Register Notice proposing the critical habitat designation will identify these unoccupied areas and request public comment. We also anticipate that ongoing recovery planning processes will develop better information about the species’ need for habitat areas beyond those currently occupied.

### Military Lands

Recent amendments to the ESA direct the Secretary not to designate military lands as critical habitat if those lands are covered by an Integrated Natural Resource Management Plan (INRMP) under the Sikes Act that the Secretary certifies in writing benefits the listed species (Section 4(a)(3) ( National Defense Authorization Act is Public Law. No. 108-136)). To address this new provision, we contacted the Department of Defense and requested information on all INRMPs that might benefit Pacific salmon and steelhead. In response the military services identified 25 installations in California iwth INRMPs in place or under development. Based on the information provided by the military as well as GIS analysis of fish distributional information compiled by the Southwest Region (NMFS 2004a) and land use/ownership information, we determined that 5 military installations with INRMPs overlapped with habitat areas under consideration for critical habitat designation. These included: Camp Pendleton Marine Corps Base, Vandenberg Air Force Base, Camp San Luis Obispo, Camp Roberts, and Mare Island Army Reserve Center. Two additional facilities are adjacent to, but do not appear to overlap wit habitat areas under consideration: Naval Weapons Station, Seal Beach/Concord Detachment, and Point Mugu Naval Air Station. None of the remaining facilities with INRMPs in California were adjacent to or overlapped with habitat under consideration. With the exception of the Vandenberg AFB INRMP, all INRMPs are final. Based on this analysis, we requested copies of these plans from the military for review, and analyzed them to

determine whether they provided benefits to the listed ESUs. Our preliminary review indicates that each of the INRMPs that overlap with occupied salmonid habitat under consideration as critical habitat address habitat for salmonids and all contain measures that provide benefits to the listed ESUs. Examples of types of benefits include actions that control erosion, protect riparian habitat zones, and reduce contaminants. Based on the available information, we determined that these INRMPs provide benefits to the listed species.

## B) Conduct a Section 4(b)(2) Analysis

### Analyzing Co-Extensive Impacts

As discussed in the “Background” section, NMFS’ 2000 designation of critical habitat for 19 ESUs of salmon and steelhead was vacated by a court order following a court challenge to the designations (*National Association of Homebuilders v. Evans*, 2002 WL 1205743 No. 00-CV-2799 (D.D.C.)) (*NAHB*). In the 2000 designations, NMFS concluded there would be no impact from the designations, because we were only designating occupied areas. Federal agencies must ensure their actions are not likely to result in the destruction or adverse modification of critical habitat and are not likely to jeopardize the species’ continue existence. In occupied habitat, we had reasoned that any action that adversely modifies critical habitat would also jeopardize the species, thus there would be no impact of designation beyond the impact already imposed by the listing and the accompanying jeopardy requirement.

While the case against us was pending, the Court of Appeals for the Tenth Circuit vacated the U.S. Fish and Wildlife Service’s critical habitat designation for the southwestern willow flycatcher (*New Mexico Cattle Growers Association v. U.S. Fish and Wildlife Service*, 248 F.3d 1277 (10<sup>th</sup> Cir. 2001)) (*NMCA*). The Service had determined there would be no economic impact from the designation because the impacts associated with jeopardy determinations and adverse modification determinations were coextensive. The Tenth Circuit found the Service’s approach rendered meaningless Congress’s requirement that economic impacts be considered in the designation process. The Court concluded that, to give “effect to Congressional directive,” the Service must analyze the full impacts of designation, regardless of whether those impacts are co-extensive with other impacts (such as the impact of the jeopardy avoidance requirement). Given the decision in the Tenth Circuit, and the similarity between the Fish and Wildlife Service’s analysis and ours, NMFS sought a voluntary remand of the designations, which the District Court granted.

In granting our motion for a voluntary remand for the salmon and steelhead designations, the district court in *NAHB* noted, “[f]rom this court’s perspective the Tenth Circuit’s opinion is well-reasoned and comports with the express statutory language of Congress, which specifically requires that an analysis of the economic impact of a critical habitat designation be undertaken.” The court observed that “clearly, there is a problem with the current process underlying the critical habitat designation process.” The court left it to the agency’s “wisdom and institutional knowledge” to remedy the problem and noted “[p]resumably, when the agency conducts new rulemaking it will be in accord with procedures it views to be in accordance with the law.”

In re-designating critical habitat for these 7 salmon and O. mykiss ESUs, we have followed the *NAHB* court's directive to give effect to the statutory requirement to consider the economic impact of designation. Areas designated as critical habitat are subject to ESA Section 7 which provides that federal agencies ensure their actions do not destroy or adversely modify critical habitat. To evaluate the economic impact of critical habitat we first examined our consultation record with these as well as other ESUs of salmon and steelhead. That record includes consultations on habitat-modifying federal actions both where critical habitat has been designated and where it has not. We could not discern a distinction in the impacts of applying the jeopardy provision versus the adverse modification provision in occupied habitat. Given our inability to detect a measurable difference between the impacts of applying these two provisions, the only reasonable alternative seemed to be to follow the recommendation of the Tenth Circuit, approved by the *NAHB* court – measure the coextensive impacts, that is, measure the entire impact of applying the adverse modification provision of section 7, regardless of whether applying the jeopardy provision would result in the identical impact.

The Tenth Circuit's opinion addressed only section 4(b)(2)'s requirement that economic impacts be considered (“The statutory language is plain in requiring some kind of consideration of economic impact in the CHD phase”). The Court did not address how “other relevant impacts” were to be considered, nor did it address the benefits of designation. Because section 4(b)(2) requires a consideration of other relevant impacts of designation, and of benefits of designation, and because our record did not support a distinction between impacts resulting from application of the adverse modification provision versus the jeopardy provision, we have concluded that we must uniformly consider coextensive impacts and coextensive benefits. To do otherwise would distort the balancing test contemplated by section 4(b)(2), once impacts have been considered.

We recognize that, in reality, excluding an area from designation may not avoid all of the impacts because the section 7 requirement regarding avoidance of jeopardy still applies. Similarly, much of the section 7 benefit would still apply because the jeopardy requirement still applies. Nevertheless, the analytical framework we are recommending provides a meaningful comparison of the relative benefits and impacts.

#### Analytical Framework for Determining and Weighing Impacts and Benefits

Section 4(b)(2) provides that the Secretary shall consider certain impacts before designating critical habitat: “the Secretary shall designate critical habitat . . . on the basis of the best scientific data available and after taking into consideration the economic impact, impact to national security, and any other relevant impact of specifying any particular area as critical habitat.” In addition, section 4(b)(2) provides that the Secretary may exclude any area from critical habitat upon a determination that “the benefits of such exclusion outweigh the benefits of specifying such area as critical habitat.”

The balancing test in section 4(b)(2) contemplates weighing benefits that are not directly comparable – the benefit to species conservation balanced against the economic benefit, benefit to national security, or other relevant benefit that results if an area is excluded from designation. Section 4(b)(2) does not specify a method for the weighing process. Agencies are frequently required to balance benefits of regulations against impacts; Executive Order 12866 codified this requirement for federal agency regulation. Ideally

such a balancing would involve first translating the benefits and impacts into a common metric. Executive branch guidance from the Office of Management and Budget suggests that benefits should first be monetized – converted into dollars. Benefits that cannot be monetized should be quantified (for example, numbers of fish saved.) Where benefits can neither be monetized nor quantified, agencies are to describe the expected benefits (OMB 2003).

It may be possible to monetize benefits of critical habitat designation for a threatened or endangered species in terms of willingness-to-pay (OMB 2003). However, we are not aware of any available data that would support such an analysis for salmon and O. mykiss. The short statutory timeframes, geographic scale of the designations under consideration, and the statute's requirement to use best "available" information suggest such a costly and time-consuming approach is not required or appropriate. In addition, section 4(b)(2) requires analysis of impacts other than economic impacts that are equally difficult to monetize, such as benefits to national security of excluding areas from critical habitat. In the case of salmon and steelhead designations, impacts to Northwest tribes are an "other relevant impact" that also may be difficult to monetize.

An alternative approach, approved by OMB, is to conduct a cost-effectiveness analysis. A cost-effectiveness analysis ideally first involves quantifying benefits, for example, percent reduction in extinction risk, percent increase in productivity, or increase in numbers of fish. Given the state of the science, it would be difficult to quantify the benefits reliably. There are models for estimating numbers of salmon that might be produced from a watershed under different sets of environmental conditions (e.g. Ecosystem Diagnosis and Treatment Model). While such models give quantified results, the accuracy of the quantified projections is uncertain because of the lack of data both on the relationships between environmental conditions and numbers of fish and the actual conditions of habitat in a given area. This leads to a heavy reliance on expert opinion for estimating habitat condition and the expected response of fish to changing environmental conditions in a specific location. Moreover, applying such models at the scale required for Pacific salmon would be time-consuming and costly.

Although it is difficult to monetize or quantify benefits of critical habitat designation, it is possible to differentiate among habitat areas based on their relative contribution to conservation. For example, habitat areas can be rated as having a high, medium or low conservation value. Like the models discussed above, such a rating is based on best professional judgment. The simpler output (a qualitative ordinal ranking), however, may better reflect the state of the science for the geographic scale considered here than a quantified output, and can be done more easily within the statutory timeframes and with available information. The qualitative ordinal evaluations can then be combined with estimates of the economic costs of critical habitat designation in a framework that essentially adopts that of cost-effectiveness. Individual habitat areas can then be assessed using both their biological evaluation and economic cost, so that areas with high conservation value and lower economic cost have a higher priority for designation and areas with a low conservation value and higher economic cost have a higher priority for exclusion.

Regardless of the analytical approach, what weight the agency gives various impacts and benefits, and whether the agency excludes areas from the designation, are discretionary

and must be grounded in the policies of the agency and the executive branch. In seeking the appropriate policy guidance we looked to executive orders, secretarial orders, and other expressions of agency or Administration direction.

#### Executive Order 12866

##### Section 1. Statement of Regulatory Philosophy and Principles.

###### (a) The Regulatory Philosophy.

In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

###### (b) The Principles of Regulation.

...

(5) When an agency determines that a regulation is the best available method of achieving the regulatory objective, it shall design its regulations in the most cost-effective manner to achieve the regulatory objective. In doing so, each agency shall consider incentives for innovation, consistency, predictability, the costs of enforcement and compliance (to the government, regulated entities, and the public), flexibility, distributive impacts, and equity.

#### Secretarial Order # 3206– American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act, Appendix

Sec. 2. General Policy. (A) Goals. The goals of this Appendix are to provide a basis for administration of the Act in a manner that (1) recognizes common federal-tribal goals of conserving sensitive species (including candidate, proposed, and listed species) and the ecosystems upon which they depend . . .

...

4) In keeping with the trust responsibility, shall consult with the affected Indian tribe(s) when considering the designation of critical habitat in an area that may impact tribal trust resources, tribally-owned fee lands, or the exercise of tribal rights. Critical habitat shall not be designated in such areas unless it is determined essential to conserve a listed species. In designating critical habitat, the Services shall evaluate and document the extent to which the conservation needs of the listed species can be achieved by limiting the designation to other lands.

#### Draft Hatchery Listing Policy (69 FR 31354; June 3, 2004)

NMFS will apply this policy in support of the conservation of naturally-spawning salmon and the ecosystems upon which they depend, consistent with section 2(b) of the ESA.

At President Bush's direction, recovery of salmon is the major focus for NOAA in the Pacific Northwest, an objective widely shared in the region and the nation. . . Much work remains to be done to expand the habitat to support future generations of naturally spawning populations.

...  
The central tenet of the hatchery policy is the conservation of naturally-spawning salmon and the ecosystems upon which they depend.

From these expressions of agency and executive branch policy, our recommendation for the agency exercise of section 4(b)(2) discretion is based on the following goals:

- Do not exclude areas from the designation if the exclusion is likely to significantly impede conservation of the species.
- Use the exclusion process to efficiently reduce economic impacts, while also considering the equitable allocation of impacts, consistent with the first goal.
- Use the exclusion process to reduce impacts to national security, and other relevant impacts of critical habitat designation, while considering the first goal.

A) Determine the benefit of designating each area as critical habitat

The principal benefit of designating critical habitat is that ESA section 7 requires every federal agency to ensure that any action it authorizes, funds or carries out is not likely to result in the destruction or adverse modification of critical habitat. This complements the Section 7 provision that federal agencies ensure their actions are not likely to jeopardize the continued existence of a listed species. Another possible benefit is that the designation of critical habitat can serve to educate the public regarding the potential conservation value of an area. This may focus and contribute to conservation efforts by clearly delineating areas of high conservation value for certain species.

After establishing those areas (i.e. HSA watershed units) that meet the definition of critical habitat, we asked the teams of NMFS biologists to determine the relative conservation value of each area for each ESU (high, medium or low) based on the results of a standardized scoring system. This evaluation provided information necessary to determine the benefit of designating any particular habitat area as critical habitat in a manner that would aid the 4(b)(2) balancing test. The higher the conservation value of an area, the greater the benefit of sections 7's requirements that federal agency action not adversely modify the area.

The teams first scored each occupied habitat area (i.e. HSA) based on five factors related to the quantity and quality of the physical and biological features. They next considered each area in relation to other areas and with respect to the population occupying that area. Based on a consideration of the raw scores for each area, and a consideration of that area's contribution in relation to other areas and in relation to the overall population

structure of the ESU, the teams rated each habitat area as having a “high,” “medium” or “low” conservation value. The teams did not discount the conservation value of any specific area based on a presumption that the section 7 prohibition against jeopardy would protect the habitat regardless of whether it was designated as critical habitat.

Areas rated “high” are likely to contribute the most to conservation of an ESU, while those rated “low” are likely to contribute least. A rating of “high” carries with it a judgment that this area contributes significantly to conservation. A rating of “low” does not mean an area has no conservation value (and therefore there would be no benefit of designation), nor does it mean there would be no impact on conservation of the ESU if the habitat were adversely modified. The benefit of designating a habitat area with a low conservation value will depend on the reasons the area received a “low” rating, on the conservation value of other habitat areas available to the ESU, and on whether nearby habitat areas are designated.

As discussed earlier, the scale we chose for the “specific area” referred to in section 3(5)(A) was occupied stream reaches within a CALWATER HSA watershed unit. Throughout this report we refer to CALWATER HSAs as watersheds, and the occupied stream reaches within a watershed as habitat areas. There were some complications with this delineation that required us to adapt the approach for some areas. In particular, a large stream or river might serve as a connectivity corridor to and from many watersheds, yet be imbedded itself in a watershed. In any given watershed through which it passes, the stream may have a few or several tributaries. For connectivity corridors embedded in a watershed, we asked the teams of biologists to rate the conservation value of the watershed based on the tributary habitat. We assigned the connectivity corridor the rating of the highest-rated watershed for which it served as a connectivity corridor. This could result in a connectivity corridor with a high rating embedded in a habitat area with a low or medium rating.

The reason for this treatment of connectivity corridors is the role they play in the salmon and steelhead life cycle. Salmon and steelhead are anadromous – born in fresh water, migrating to salt water to feed and grow, and returning to fresh water to spawn. Without a connectivity corridor to and from the sea, salmon cannot complete their life cycle. It would be illogical to consider a spawning and rearing area as having a particular conservation value and not consider the associated connectivity corridor as having a similar conservation value.

## B) Determine the Impact of Designation

### i) Economic impact

In a separate draft report, the Southwest Region has documented its conclusions regarding the economic impacts of designating each of the particular areas (HSAs) found to meet the definition of critical habitat (NMFS 2004c). The first step was to identify the baseline conditions – the legal and regulatory constraints on economic activity that are independent of critical habitat designation, for example Clean Water Act requirements. Coextensive impacts of the section 7 jeopardy requirement were not considered part of the baseline. Next, from the consultation record, we identified federal activities that might affect habitat and that might result in a section 7 consultation. We did not consider

federal actions, such as the approval of a fishery, that might affect the species directly but not affect its habitat. We identified nine types of activities and the modifications each type of activity was likely to undergo as a result of section 7 consultation. We developed an expected direct cost for each type of action and projected the likely occurrence of each type of project in each watershed, using existing spatial databases (for example., the U.S. Army Corps of Engineers 404(d) permit database). Finally, we aggregated the costs from the various types of actions and estimated an annual impact, taking into account the probability of consultation occurring and the likely rate of occurrence of that project type.

The economic analysis makes certain simplifying assumptions that likely cause costs to be overstated. For example, costs are assigned to all activities within the geographic boundary of the watershed, even though not all federal activities lead to a section 7 consultation. The analysis also makes assumptions about the likely impact of modifications to hydropower projects, when in fact many of the projects included in the analysis may not require modifications. This could not be determined without further analysis, which time did not permit. Nevertheless, the analysis was based on the best information available within the time constraints, and provides a reasonable basis for comparing cost impacts among different areas to inform the designation process.

There were also complications in assigning economic impacts to a single habitat area when in fact the activity in question might have impacts outside that area. For example, a hydroelectric dam will often have downstream effects on flows and temperature that extend beyond the boundary of the habitat area in which the dam is located. Costs of designation could therefore be attributable to any habitat area influenced by dam operations. To simplify the analysis, these costs were assumed to accrue to the designation of the watershed in which the dam or other activity occurred.

The economic analysis used two different discount rates to predict future costs (7 and 3 percent). In conducting our 4(b)(2) cost-effectiveness analysis we focused on the estimates that used the 7 percent rate. We also tested our methods against the estimates using the 3 percent rate and found the results would not change.

ii) Impact on national security

In addition to considering the economic impacts of designation, NMFS must also consider the impact on national security. To determine the impact of designation on national security, we contacted the Department of Defense and provided them with information on those areas we considered as meeting the definition of critical habitat. The DOD responded with information indicating which facilities were within the range of listed ESUs under consideration and for which INRMPs had been developed, as well as some limited information regarding impacts to national security. Information regarding impacts to national security was provided for the Camp Pendleton Marine Corps Base and Vandenberg Air Force Base, but limited to no information was provided for other facilities. As indicated previously, both of these facilities have INRMPs which provide benefits to listed O. mykiss which qualify them for exclusion on that basis. Both facilities also provided information indicating that critical habitat designations would impact national security by diminishing military readiness. Because these two facilities overlap with only a very small percentage of the occupied habitat that qualifies for

possible designation, and designation of critical habitat would likely impact military readiness on both facilities, we concluded that the benefits of excluding these areas outweighed the benefits of their inclusion. We anticipate continuing to work with DOD to obtain and review additional information on national security impacts before issuing a final rule.

iii) Impact on tribes

In developing the proposed designation, we identified Indian lands in California that overlapped with or were adjacent to habitat occupied by listed salmonids that qualified for consideration as critical habitat using GIS analysis. Based on this analysis, we determined that only 7 Indian tribes, the largest of which was the Round Valley Indian Tribes in the Eel River basin, had lands overlapping with occupied habitat at the scale of our analysis. The remaining 6 Indian lands with overlap are under the control of small rancherias. We subsequently attempted to consult with these tribes and the BIA to determine their views regarding the impacts of potential critical habitat designation on their lands. Based on responses from the BIA and the Round Valley Indian Tribes, we understand that they believe the designation of critical habitat on Indian lands would have a negative impact on tribal sovereignty and tribal self-governance. The longstanding and distinctive relationship between the federal and tribal Governments is defined by treaties, statutes, executive orders, judicial decisions, and agreements, which differentiate tribal governments from the other entities that deal with, or are affected by, the federal government. This relationship has given rise to a special federal trust responsibility involving the legal responsibilities and obligations of the United States toward Indian Tribes and the application of fiduciary standards of due care with respect to Indian lands, tribal trust resources, and the exercise of tribal rights. Pursuant to these authorities, lands have been retained by Indian Tribes or have been set aside for tribal use. These lands are managed by Indian Tribes in accordance with tribal goals and objectives within the framework of applicable treaties and laws.

California tribes, and the Round Valley Indian Tribes in particular among those that overlap with occupied habitat under consideration in this designation effort, are regarded as co-managers of the salmon and steelhead resource along with Federal and State managers. The Round Valley Indian Tribes has an existing natural resource program that assists NMFS on a regular basis in providing management information relevant to salmon and steelhead protection throughout the region. They are also a recipient of Pacific Coast Salmon recovery funds for habitat restoration and management efforts on their lands and work closely with Southwest Region staff on a wide range of other issues of common interest to the agency and the Tribes. The other 6 smaller tribal entities under consideration do not have organized natural resource management programs like the Round Valley Tribes because of their small size. Our consultation with the Round Valley Indian Tribes and the BIA indicates that they view the designation of Indian lands as an unwanted intrusion into tribal self-governance which thus compromises the government-to-government relationship that is essential to achieving our mutual goal of conserving threatened and endangered salmon and steelhead.

We concluded that the designation of Indian lands as critical habitat would have a negative impact on the longstanding unique relationship between the tribes and the federal government and have a corresponding negative impact on Pacific salmon

protection and management. We considered these impacts to be relevant to the section 4(b)(2) consideration, consistent with recent case law addressing the designation of critical habitat on tribal lands. “It is certainly reasonable to consider a positive working relationship relevant, particularly when the relationship results in the implementation of beneficial natural resource programs, including species preservation.” *Center for Biological Diversity et. al. v. Norton*, 240 F. Supp. 2d 1090, 1105); *Douglas County v. Babbitt* 48 F3d 1495, 1507 (1995)(defining “relevant” as impacts consistent with the purposes of the Act).

C) Determine whether the benefits of exclusion outweigh the benefits of designation

We first considered impacts to national security and impacts to tribal relations and tribal sovereignty.

Balancing designation against impacts to national security

Since we did not have an opportunity prior to proposing the designation to review the information provided by the Department of Defense regarding impacts to national security, we were unable to recommend excluding military lands because of impacts to national security. We anticipate having that opportunity after the proposed rule is published and will issue a supplemental report with recommendations regarding those exclusions prior to issuing a final critical habitat designation.

Balancing designation against impacts to tribal sovereignty and participation in conservation activities

We considered the benefits of excluding Indian lands from designation as: 1) the furtherance of established national policies, our federal trust obligations and our deference to the tribes in management of natural resources on their lands; 2) the maintenance of effective long term working relationships to promote the conservation of salmon and steelhead on an ecosystem-wide basis across four states; 3) the allowance for continued meaningful collaboration and cooperation in scientific work to learn more about the conservation needs of the species on an ecosystem-wide basis; and 4) continued respect for tribal sovereignty over management of natural resources on Indian lands through established tribal natural resource programs.

We believe that the current co-manager process addressing activities on an ecosystem-wide basis in California is currently beneficial for the conservation of the 7 listed ESUs under consideration. We also believe that maintenance of our current co-manager relationship consistent with existing policies is an important benefit to continuance of our tribal trust responsibilities and relationship. Because the co-manager process provides for coordinated ongoing focused action through a variety of forums in California we find the benefits greater than the application of Section 7 to federal activities on Indian lands which contain less 0.1 percent of all occupied stream habitat in the 7 ESUs under consideration.

Based on these considerations, we recommend the agency exercise its discretion under section 4(b)(2) to exclude Indian lands from the proposed critical habitat designation for the 7 ESUs of salmon and steelhead subject to the Southwest Region's management jurisdiction. The Indian lands specifically recommended for exclusion are those defined

in the Secretarial Order, including: 1) lands held in trust by the United States for the benefit of any Indian tribe, 2) land held in trust by the United States for any Indian Tribe or individual subject to restrictions by the United States against alienation, 3) fee lands, either within or outside the reservation boundaries, owned by the tribal government; and, 4) fee lands within the reservation boundaries owned by individual Indians.

#### Balancing designation against economic impacts

Finally we examined areas that would be eligible for exclusion if we considered the economic impact to outweigh the benefit of designation. In determining whether the economic benefit of excluding a habitat area might outweigh the benefit to the species of designation, we considered the following factors: 1) the policy goal of exercising our discretion to further conservation of listed species; 2) the policy goal of adopting regulations that minimize total economic impacts and disparate economic impacts; 3) the difficulty of balancing dissimilar values (dollars versus benefits to species conservation); and 4) the limited time frame in which to make decisions. Consideration of these factors led us to a cost-effectiveness approach (described above) in which we gave priority to excluding habitat areas with a relatively lower benefit of designation and a relatively higher economic impact.

The circumstances of most of the listed ESUs seem well suited to a cost-effectiveness approach. Pacific salmon and steelhead are wide-ranging species and occupy numerous habitat areas with thousands of stream miles. Most of these areas contain “physical or biological features” we have identified as “essential to conservation” of the ESUs. Not all these areas, however, are of equal importance to conserving an ESU, as evidenced by the biological team's rating of different HSAs as having high, medium or low conservation value. In many cases it may therefore be possible to construct different scenarios for achieving conservation. Scenarios might have more or less certainty of achieving conservation, and more or less economic impact.

To give effect to our first policy goal – not excluding any areas from designation if exclusion would significantly impede conservation – we decided to test a two-step approach. In the first step we would identify all areas eligible for exclusion. Eligibility would be determined based on criteria determined by our policy goals. In the second step we would ask the biological teams to consider whether excluding any of the eligible areas, either alone or in combination with other eligible areas, would significantly impede conservation. For the first step, we sought criteria that would result in a list of eligible areas with a meaningful cost savings. At the same time we did not want to develop a list that would then require extensive modification as a result of applying biological judgment in the second step. With more time to conduct the analysis it would be possible to have numerous iterations between the biological and economic considerations. Given the time frames of the statute and limited time for iterations, however, we sought criteria that would allow the second step to be reasonably efficient.

We also sought criteria that would account for the fact that recovery planning processes are not yet complete. The timeframes associated with the designation process necessarily lead to decisions regarding designation of critical habitat in advance of recovery planning. This is a factor for the agency to consider in deciding whether to exclude any areas.

To better determine the most appropriate criteria, we first considered alternative scenarios for the initial exclusion criteria. In a scenario similar to a “no action” alternative, we did not exclude any areas. This scenario would provide the maximum benefit of designation to the species, and a useful point of comparison for the economic benefit possible from other scenarios. In a second scenario we simply considered as eligible for exclusion all habitat areas with a low- or medium-value rating. In a third scenario we developed dollar thresholds for low- and medium-value areas likely to result in meaningful economic reductions, but that would not in most cases automatically make all the low- and medium-value habitat areas eligible for exclusion. Based on the rating process used by the biological teams, we judged that exclusion of any of the high-value areas in this third scenario would significantly impede conservation.

Selection of criteria for the third scenario was complicated by the fact that the circumstances of each ESU are unique. Some ESUs had a higher proportion of low- and medium-value areas than others. Different criteria could therefore be expected to produce different results for different ESUs. In developing criteria for the third scenario, we chose dollar thresholds that we anticipated would lead most directly to a cost-effective scenario, recognizing that the question of whether the economic benefit of excluding any particular area outweighs the benefit of designating that area can only be answered in the context of the overall designation – the conservation impact of excluding any particular area may depend on which other areas are being excluded, and therefore the benefit of designation may depend on what else is being designated.

As initial criteria for identifying habitat areas eligible for exclusion, we selected “impacts greater than \$70,000” for low-value areas. For medium-value areas, we selected “impacts greater than \$300,000”. The statute directs us to balance dissimilar interests with a limited amount of time (and therefore information). It emphasizes the discretionary nature of the decision to exclude. Moreover, while our approach follows the *NAHB* Court’s direction to consider coextensive economic impacts, we nevertheless must acknowledge that all of the cost estimates are likely higher than the true cost of a critical habitat designation. Finally, the cost estimates developed by our economic analysis give a smooth distribution of costs, with no obvious break point that would lead to a logical division between “high,” “medium,” and “low” costs that might correspond to high, medium and low conservation value. Given these factors, a judgment that any particular dollar threshold is objectively “right,” would be neither necessary nor possible. Rather, what economic impact is “high” and therefore might outweigh the benefit of designating a medium- or low-value habitat area is a matter of discretion and depends on the policy context. The policy context in which we carry out this task led us to select dollar thresholds that would likely lead to a cost-effective designation in a limited amount of time with a relatively simple process.

The following table illustrates the results of each scenario for each ESU (L=Low; M=Medium and H=High). Where a habitat area contains tributaries with one rating and a connectivity corridor with another rating, the impacts are separated and attributed accordingly. For example, if a habitat area has a low-value tributary rating and a high-value connectivity corridor, the economic impact of designating the high-value connectivity corridor is represented in the “high” category and the impact of designating the tributaries is represented in the “low” category.

Table 1. Comparison of alternative scenarios for excluding certain areas from critical habitat designation under ESA section 4(b)(2). The cumulative potential economic impact of designating habitat areas within watersheds is presented for the low conservation value, medium conservation value, high conservation value, and all habitat areas for each Evolutionarily Significant Unit (ESU). The reduction in potential economic impact is then presented for each of the three scenarios. Economic impacts reflect those for watersheds and connectivity corridors within the spawning and rearing range of a given ESU.

		<u>Potential Reduction in Maximum Economic Impact</u> <i>(reduction in annual economic impact of section 7 consultations)</i>		
Conservation value of HUC5 watersheds	<u>Maximum economic impact</u>	<u>Scenario 1</u>	<u>Scenario 2</u>	<u>Scenario 3</u>
<i>L = low value</i> <i>M = medium value</i> <i>H = high value</i>	<i>Annual economic impact of section 7 consultations</i>	<i>No areas eligible for exclusion</i>	<i>All low-value(L) and medium-value (M) areas eligible for exclusion. For L and M areas with high-value (H) migration/connectivity corridors, only tributaries are eligible for exclusion.</i>	<i>All low-value (L) areas with an economic impact &gt; \$70,000/yr and all medium-value (M) areas with an economic impact of \$300,000/yr are eligible for exclusion</i>
<b>1. California Coastal Chinook ESU</b>				
L	\$3,331,008	\$0	-\$3,331,008	-\$3,227,074
M	\$1,259,753	\$0	-\$1,259,753	-\$838,000
H	\$7,080,962	\$0	\$0	\$0
Total	\$11,651,723	\$0	-\$4,590,761	-\$4,065,164
<b>2. Northern California O. mykiss ESU</b>				
L	\$738,922	\$0	-\$738,922	-\$701,020
M	\$4,340,838	\$0	-\$4,340,838	-\$3,921,584
H	\$5,762,597	\$0	\$0	\$0
Total	\$10,842,357	\$0	-\$5,079,760	-\$4,622,604
<b>3. Central California Coast O. mykiss ESU</b>				
L	\$2,798,195	\$0	-\$2,798,195	-\$2,729,657
M	\$2,636,268	\$0	-\$2,636,268	-\$1,826,740
H	\$3,893,533	\$0	\$0	\$0
Total	\$9,327,996	\$0	-\$5,434,463	-\$4,556,397
<b>4. South-Central California Coast O. mykiss ESU</b>				
L	\$205,718	\$0	\$205,718	\$95,236
M	\$3,129,920	\$0	-\$3,129,920	-\$2,104,721
H	\$6,748,655	\$0	\$0	\$0

Total	\$10,084,293	\$0	-\$3,335,638	-\$2,199,957
<u>5. Southern California O. mykiss ESU</u>				
L	\$6,315,271	\$0	-\$6,315,271	-\$6,315,271
M	\$3,223,265	\$0	-\$3,223,265	-\$2,658,812
H	\$11,470,210	\$0	\$0	\$0
Total	\$21,008,746	\$0	-\$9,538,536	-\$8,974,083
<u>6. Central Valley Spring run Chinook ESU</u>				
L	\$5,602,539	\$0	-\$5,602,539	-\$5,538,988
M	\$1,555,324	\$0	-\$1,555,324	-\$1,226,452
H	\$16,419,528	\$0	\$0	\$0
Total	\$23,577,391	\$0	-\$7,157,863	-\$6,765,440
<u>7. Central Valley O. mykiss ESU</u>				
L	\$4,344,274	\$0	-\$4,344,274	-\$4,251,892
M	\$3,835,264	\$0	-\$3,835,264	-\$2,851,016
H	\$21,008,350	\$0	\$0	\$0
Total	\$29,187,888	\$0	-\$8,179,538	-\$7,102,908

Scenario 1 illustrates the total estimated economic impact of applying section 7 requirements to habitat-modifying actions in all of the habitat areas within an ESU. Scenario 2 illustrates the estimated potential reduction in economic impact if all of the low- and medium-value habitat areas are excluded, and Scenario 3 illustrates the estimated potential reduction in economic impact if low- and medium-value habitat areas above a particular dollar threshold are excluded. The cost reductions shown are only potential reductions. Until the second step of the analysis is completed (i.e. the evaluation by biological teams), it is not possible to determine the final estimated reduction that scenario would yield. In considering the scenarios, we kept in mind that both the costs and reductions to cost are likely overstated because the jeopardy requirement of section 7 still applies. Nevertheless, examining alternatives gives a useful picture of the relative outcomes of different scenarios.

Scenario 1 would meet the first policy goal of not excluding any area if exclusion would significantly impede conservation. However, it would not serve the second policy goal of minimizing costs. Scenario 2 furthers the goal of reducing economic impacts, but without any sensitivity to the fact that for some habitat areas the cost is relatively small so the incremental benefit of excluding that area is small (making it problematic to conclude that the benefit of exclusion outweighs the benefit of designation without a more refined analysis of whether a low-value area is a “low-low” or a “high-low”). Scenario 2 is also not sensitive to the fact that for most ESUs, eliminating all low- and medium-value habitat areas is likely to significantly impede conservation. While the second step of the test (application of biological judgment) would address this concern, it would not do so in an efficient way – that is, it would not efficiently lead to the low-cost areas being favored for designation and the high cost areas favored for exclusion. For Scenario 2, it is unlikely that all of the potential reductions would be retained through the second step. The end result also may not be economically efficient unless there are additional iterative steps that allow for consideration of economic impacts as the list of

all areas eligible for exclusion is narrowed to a combination of only those that will meet the first policy goal (that is, not significantly impede conservation).

In contrast, Scenario 3 is sensitive to the fact that excluding some low and medium areas will not result in the same cost savings as excluding other low and medium areas. It is also sensitive to the fact that excluding all low and medium areas in all ESUs would not result in an efficient second step of the process. Based on these considerations, we applied the economic criteria described for Scenario 3, through a two-step test, to develop a set of recommended exclusions.

D) Determine whether the exclusions will result in extinction of the species

For exclusions based on impacts to tribes we overlaid Indian lands on mapped distribution of the 7 ESUs to determine what if any tribal lands contained occupied riverine habitat that could potentially be designated. In addition, we considered how exclusion of each would affect the conservation of the ESU. Overall Indian lands comprise less than 0.1 percent of the occupied stream miles for three of the ESUs. For four of the ESUs, our analysis did not indicate that occupied streams occurred on Indian lands. Table 2 displays the number of stream miles within or adjacent to reservation boundaries for each ESU. These numbers are a maximum estimate since we are recommending for exclusion only those lands within reservation boundaries that are defined as “Indian lands” by the Secretarial Order.

Table 2. Stream miles meeting the definition of critical habitat, within the boundaries of an Indian reservation, by ESU.

ESU	Total Eligible Miles	Tribal Lands	Percent
CC Chinook	1,638	12	<0.1
NC O. mykiss	3,128	23	<0.1
CCC O. mykiss	2,002	1	<0.1
SCCC O. mykiss	1,261	0.0	0
SC O. mykiss	837	0.0	0
CV spring run chinook	1,381	0.0	0
CV O. mykiss	2,607	0.0	0

Section 4(b)(2) does not allow the agency to exclude areas if exclusion will result in extinction of the species. For exclusions based on economic considerations, we applied the first policy goal – not to exclude any habitat areas if the exclusion would significantly impede conservation. We have determined for each ESU that the exclusion of the areas we recommend, either individually or collectively, will not significantly impede conservation. Given that conclusion, we also conclude that none of the exclusions we recommend will result in extinction of the species.

### III. AREAS RECOMMENDED FOR EXCLUSION – BY ESU

Having developed a two-step process for the 4(b)(2) balancing test, we applied it to each ESU separately. Many of the habitat areas under consideration meet the definition of critical habitat for more than one ESU, that is, they have overlapping critical habitat. For example, the Central Valley spring chinook and Central Valley O. mykiss ESUs have

overlapping distributions in the Sacramento River watershed and Delta. Similarly, California Coast chinook and North Coast O. mykiss have very similar distributions, and portions of California Coastal chinook overlap with the Central California Coast O. mykiss. Also, in the Central Valley and on the coast north of Santa Cruz, there are other listed ESUs with critical habitat currently designated that are not part of this rulemaking (Sacramento River winter-run chinook in the central valley and Central California coast coho, and Southern Oregon/Northern California coho on the north coast).

In areas of overlap, we could have decided that the critical habitat for one ESU would be designated first. Protection for the first ESU would then be part of the baseline for the second or third ESU, so there would be little impact from the subsequent designations. We decided against this approach for several reasons. The decision of which ESU went first could have a major effect on the incremental impact of the subsequent ESUs, creating an opportunity to manipulate the outcome. In addition, if one ESU were to recover and be de-listed, its critical habitat designation would also be gone, leaving the remaining designations in place. In contrast, an approach that considered the independent effect of each designation would accurately represent the situation if one of the designations were no longer to apply. We were most persuaded to adopt an approach that considers the independent impacts of designation by our overall view of the 4(b)(2) process. So long as we also consider the independent benefit of each designation for each ESU, regardless of designations present for other ESUs, we will still have an accurate picture of the benefits of designation versus the benefits of exclusion.

One result of this decision is that there are some areas that are designated for one ESU but excluded for another, because the differing habitat needs may lead to an area being rated high-value for one ESU but medium- or low-value for another. In recommending exclusions, we did not make a separate effort to match exclusions. Consistent with our approach throughout, we considered the impacts of designation and the benefits of designation for each ESU based on its individual circumstances.

#### 1. California Coast (CC) chinook salmon ESU

The CC chinook salmon ESU was listed as a threatened species in 1999 (64 FR 50394). The ESU includes all naturally spawned populations of chinook salmon from rivers and streams south of the Klamath River to and including the Russian River. Following completion of an updated status review (NMFS 2003a) and review of hatchery populations located within the range of the ESU (NMFS 2003b), NMFS recently proposed that the ESU remain listed as a threatened species and that seven hatchery populations be included as part of the ESU (69 FR 33102; June 14, 2004). Major watersheds occupied by naturally spawning fish in this ESU include Redwood Creek, Mad River, Eel River, several smaller coastal watersheds, and the Russian River. A Technical Recovery Team has been formed and is in the process of identifying the historical and extant population structure of this ESU; however, this is still in progress.

There are 45 occupied HSA watersheds within the freshwater and estuarine range of this ESU. For ease of reference these watersheds have been aggregated into 8 larger subbasin units or CALWATER HUs. There are approximately 1,638 mi of occupied stream and estuarine habitat within these occupied HSA watersheds that meet the definition of critical habitat for this ESU. Eight HSA watersheds received a low rating, 10 received a medium rating, and 27 received a high rating of conservation value to the ESU (NMFS,

2004b). Two estuarine habitat areas used for rearing and migration (Humboldt Bay and the Eel River Estuary), but that are not CALWATER HSAs, were also evaluated and received a high conservation value rating. Appendix Map A1 shows the conservation ratings by watershed for this ESU.

#### Military and Indian Lands

Approximately 12 mi of occupied stream habitat occurs within or adjacent to the boundaries of six Indian reservations within the ESU including: Big Lagoon Reservation, Blue Lake Rancheria, Round Valley Indian Tribes, Laytonville Rancheria, Manchester - Point Arena Rancheria, and Redwood Valley Rancheria. We have not calculated the potential reduction in estimated economic impact as a result of these Indian land exclusions, but expect it would be small given the small percentage of stream miles these exclusions represent (less than 0.1 percent of all occupied stream miles). We have determined that the benefits of excluding the habitat areas on these Indian lands from the designation outweigh the benefits of designating them, and therefore, are proposing to exclude them from the designation for this ESU. There are no military facilities within the range of this ESU that contain occupied stream habitat eligible for designation.

#### Consideration of Economic Impacts and Recommendations for Exclusions

Appendix Table B1 shows the estimated total economic impacts for each of the occupied HSA habitat areas. The total potential estimated economic impact is \$11,651,723. Of the 8 low-value habitat areas, 4 exceeded the Scenario 3 economic impact criteria, making these areas eligible for exclusion. Of the 10 medium-value habitat areas, only one exceeded the Scenario 3 criteria. CHART team members determined that these exclusions would not impede conservation of the ESU.

In summary, we recommend that 4 low conservation value habitat areas and one medium-value habitat area be proposed for exclusion because the economic benefits of exclusion outweigh the benefits of designation. Appendix Map C1 shows those habitat areas (i.e. HSA watershed units) being recommended for exclusion. They include 113 total stream miles, representing 7 percent of the total stream miles occupied by the ESU. The reduction in estimated economic impact is approximately 35 percent of the impact that would occur if all habitat areas were designated. Combined with the excluded habitat areas on Indian lands, the total stream miles not recommended for designation represent approximately 7.5 percent of the total stream miles occupied by this ESU. After exclusions the total estimated economic impact is \$7,586,559.

We have concluded that exclusion of any of these areas alone, or of all areas in combination, would not significantly impede conservation of the CC chinook ESU. The habitat areas being recommended for designation as critical habitat include approximately 1,513 stream miles. The recommended critical habitat designation for the CC chinook ESU will complement recovery planning efforts aimed at conserving the geographic distribution and diversity of this ESU.

## 2. Northern California (NC) *O. mykiss* ESU

The NC *O. mykiss* ESU was listed as a threatened species in 2000 (65 FR 36074; June 7, 2000). The ESU includes all naturally spawned populations of *O. mykiss* in coastal river basins from Redwood Creek south to and including the Gualala River. Major watersheds

occupied by naturally spawning fish in this ESU include Redwood Creek, Mad River, Eel River, several smaller coastal watersheds on the coast south to the Gualala River. O. mykiss within this ESU include both winter and summer run types, including what is presently considered to be the southernmost population of summer run O. mykiss in the Middle Fork Eel River (NMFS 1996). The half-pounder life history type also occurs in the ESU, specifically in the Mad and Eel Rivers. Based on an updated status review (NMFS 2003a) and an assessment of hatchery populations located within the range of the ESU (NMFS 2003b), NMFS recently proposed that the ESU remain listed as a threatened species and that resident O. mykiss co-occurring with anadromous populations below impassible barriers (both natural and man-made) as well as two artificial propagation programs (Yager Creek Hatchery and North Fork Gualala River Hatchery) also be included in the ESU (69 FR 33102; June 14, 2004). A Technical Recovery Team has been formed and is in the process of identifying the historical and extant independent population structure of this ESU and associated population viability parameters for each population.

There are 50 occupied HSA watersheds within the freshwater and estuarine range of this ESU. For ease of reference these watersheds have been aggregated into 7 larger subbasin units or CALWATER HUs. There are approximately 3,128 mi of occupied stream and estuarine habitat within these occupied HSA watersheds that meet the definition of critical habitat for this ESU. Nine HSA watersheds received a low rating, 14 received a medium rating, and 27 received a high rating of conservation value to the ESU (NMFS, 2004b). Two estuarine habitat areas used for rearing and migration (Humboldt Bay and the Eel River Estuary), but that are not CALWATER HSAs, were also evaluated and received a high conservation value rating. Appendix Map A2 shows the conservation ratings by watershed for this ESU.

#### Military and Indian Lands

Approximately 23 mi of occupied stream habitat occurs within or adjacent to the boundaries of five Indian reservations within the ESU including: Big Lagoon Reservation, Blue Lake Rancheria, Round Valley Indian Tribes, Laytonville Rancheria, and Manchester - Point Arena Rancheria. We have not calculated the potential reduction in estimated economic impact as a result of these Indian land exclusions, but expect it would be small given the small percentage of stream miles these exclusions represent (less than 0.1 percent of all occupied stream miles). We have determined that the benefits of excluding the habitat areas on these Indian lands from the designation outweigh the benefits of designating them, and therefore, are proposing to exclude them from the designation for this ESU. There are no military facilities within the range of this ESU that contain occupied stream habitat eligible for designation.

#### Consideration of Economic Impacts and Recommendations for Exclusions

Appendix Table B2 shows the estimated total economic impacts for each of the occupied HSA habitat areas. The total potential estimated economic impact is \$10,842,357. Of the 9 low-value habitat areas, 1 exceeded the Scenario 3 economic impact criteria, making that area eligible for exclusion. Of the 14 medium-value habitat areas, three exceeded the Scenario 3 criteria. CHART team members determined that exclusion of one of these medium-value habitat areas (HSA 111122), which includes the Van Duzen River, would impede conservation of the ESU (See Appendix D).

In summary, we recommend that 1 low conservation value habitat area and 2 medium-value habitat area be proposed for exclusion because the economic benefits of exclusion outweigh the benefits of designation. Appendix Map C2 shows those habitat areas being recommended for exclusion. They include 116 total stream miles, representing approximately 4 percent of the total stream miles occupied by the ESU. The reduction in estimated economic impact is approximately 38 percent of the impact that would occur if all habitat areas were designated. Combined with the excluded habitat areas on Indian lands, the total stream miles not recommended for designation represent approximately 4.4 percent of the total stream miles occupied by this ESU. After exclusions the total estimated economic impact is \$6,688,254.

We have concluded that exclusion of any of these areas alone, or of all areas in combination, would not significantly impede conservation of this ESU. The habitat areas being recommended for designation as critical habitat include approximately 2,989 stream miles. The recommended critical habitat designation for this ESU will complement recovery planning efforts aimed at conserving the geographic distribution and diversity of this ESU.

### 3. Central California coast (CCC) *O. mykiss* ESU

The CCC *O. mykiss* ESU was listed as a threatened species in 1997 (62 FR 43937; August 18, 1997). The ESU includes all naturally spawned populations of *O. mykiss* in coastal river basins from the Russian River southward to and including Aptos Creek, as well as naturally spawned populations of *O. mykiss* in drainages of San Francisco and San Pablo Bay eastward to but excluding the Sacramento-San Joaquin Delta. Major coastal watersheds occupied by naturally spawning fish in this ESU include the Russian River, Lagunitas Creek, and San Lorenzo River. Important watersheds occupied by naturally spawning fish within the San Francisco Bay/San Pablo Bay area include Alameda Creek, Coyote Creek, Guadelupe Creek, Petaluma River, and the Napa River. Based on an updated status review (NMFS 2003a) and an assessment of hatchery populations located within the range of the ESU (NMFS 2003b), NMFS recently proposed that the ESU remain listed as a threatened species (69 FR 33102; June 14, 2004). In addition, NMFS proposed that: (1) resident *O. mykiss* occurring with anadromous populations below impassable barriers (both natural and man made), (2) two artificially propagated populations (Don Clausen Fish Hatchery in the Russian River basin and the Kingfisher Flat Hatchery/Scott Creek hatchery in Scott Creek south of San Francisco) and (3) three resident *O. mykiss* sub-populations above Dam 1 on Alameda Creek also be included in the CCC *O. mykiss* ESU. For the purposes of this re-designation proposal, therefore, the watershed units occupied by resident *O. mykiss* in upper Alameda Creek were considered occupied. A Technical Recovery Team has been formed and is in the process of identifying the historical and extant independent population structure of this ESU as well as the associated viability criteria for these populations.

There are 47 occupied HSA watersheds within the freshwater and estuarine range of this ESU. For ease of reference these watersheds have been aggregated into 10 larger subbasin units or CALWATER HUs. Five of these HSAs encompass the San Francisco - San Pablo - Suisun Bay complex which constitutes migratory and rearing habitat for some populations within this ESU. There are approximately 2,002 mi of occupied stream and estuarine habitat within these occupied HSA watersheds that meet the definition of

critical habitat for this ESU. The five Bay complex HSAs comprise approximately 442 mi<sup>2</sup> of habitat. Fourteen HSA watersheds received a low rating, 13 received a medium rating, and 20 received a high rating of conservation value to the ESU (NMFS, 2004b). Appendix Map A3 shows the conservation ratings by watershed for this ESU.

#### Military and Indian Lands

Approximately 1 mi of occupied stream habitat occurs within or adjacent to the boundaries of two Indian reservations within the ESU including: Coyote Valley Reservation and Redwood Valley Rancheria. We have not calculated the potential reduction in estimated economic impact as a result of these Indian land exclusions, but expect it would be small given the small percentage of stream miles these exclusions represent (less than 0.1 percent of all occupied stream miles). We have determined that the benefits of excluding the habitat areas on these Indian lands from the designation outweigh the benefits of designating them, and therefore, are proposing to exclude them from the designation for this ESU. Two military facilities are partially within or adjacent to occupied estuarine habitat that is eligible for designation (Mare Island Army Reserve Center and Naval Weapons Station, Seal Beach/Concord Detachment). We have not calculated the potential reduction in estimated economic impact as a result of these exclusions, but expect it would be small given the small amount of occupied estuarine habitat for which there is overlap. In separate documents we have determined that the military's management of the Mare Island Army Reserve Center provides benefits to the listed ESU, and therefore, the occupied habitat within or adjacent to this facility does not qualify for designation.

#### Consideration of Economic Impacts and Recommendations for Exclusions

Appendix Table B3 shows the estimated total economic impacts for each of the occupied HSA habitat areas. The total potential estimated economic impact is \$9,327,996. Of the 14 low-value habitat areas, 9 exceeded the Scenario 3 economic impact criteria, making them eligible for exclusion. Of the 13 medium-value habitat areas, four exceeded the Scenario 3 criteria. CHART team members, however, determined that exclusion of one of these medium-value habitat areas (HSA 220530), which includes the lower Coyote Creek watershed in south San Francisco Bay, would impede conservation of the ESU (see memorandum in Appendix D). The CHART team also concluded that tributary habitat in two other watersheds (HSAs 111431 and 220420) could be excluded (with one exception), but that the mainstem migration corridor in each was essential for the conservation of the ESU since it provided connectivity between upstream spawning/rearing habitat of high value and the ocean. In the case of HSA 111431, the migration corridor that is essential to conservation is the mainstem Russian River because it provides connectivity to the high value HSA 111433 that in the upper part of the Russian River watershed. In addition, the CHART team concluded that one tributary in HSA 111431 (Pieta Creek) should be included in the designation because of its contribution to the conservation of the ESU (see memorandum in Appendix D). In the case of HSA 220420, the migration corridor that is essential to conservation is lower Alameda Creek because it provides connectivity to the high value HSA 220430 (Upper Alameda Creek) which is occupied by several resident *O.mykiss* subpopulations that are proposed for inclusion in this listed ESU.

In summary, we recommend that 9 low conservation value habitat areas and 3 medium-value habitat areas (one entire watershed and two tributary only watersheds) be proposed

for exclusion because the economic benefits of exclusion outweigh the benefits of designation. Appendix Map C3 shows those habitat areas being recommended for exclusion. They include 326 total stream miles, representing approximately 16 percent of the total stream miles occupied by the ESU. The reduction in estimated economic impact is approximately 42 percent of the impact that would occur if all habitat areas were designated. Combined with the excluded habitat areas on Indian lands, the total stream miles not recommended for designation represent approximately 16 percent of the total stream miles occupied by this ESU. After exclusions the total estimated economic impact is \$5,452,712.

We have concluded that exclusion of any of these areas alone, or of all areas in combination, would not significantly impede conservation of this ESU. The habitat areas being recommended for designation as critical habitat include approximately 1,675 stream miles. The recommended critical habitat designation for this ESU will complement recovery planning efforts aimed at conserving the geographic distribution and diversity of this ESU.

#### 4. South-Central Coast (SCCC) *O. mykiss* ESU

The SCCC *O. mykiss* ESU was listed as a threatened species in 1997 (62 FR 43937). The ESU includes all naturally spawned populations of *O. mykiss* in coastal river basins from the Pajaro River southward to, but not including, the Santa Maria River. The major watersheds occupied by naturally spawning fish in this ESU include the Pajaro River, Salinas River, Carmel River, and numerous smaller rivers and stream along the Big Sur coast and southward. Most of the rivers in this ESU drain the Santa Lucia Range, the southernmost unit of the California Coast Range and only winter steelhead are found in this ESU. The climate is drier and warmer than in the north which is reflected in vegetational changes from coniferous forest to chaparral and coastal scrub. The mouths of many rivers and streams in this ESU are seasonally closed by sand berms that form during periods of low flow in the summer. Based on an updated status review (NMFS 2003a), NMFS recently proposed that the ESU remain listed as a threatened species and that resident *O. mykiss* co-occurring with anadromous populations below impassible barriers (both natural and man-made) be included in the ESU (69 FR 33102; June 14, 2004). A Technical Recovery Team has been formed and is in the process of identifying the historical and extant independent population structure of this ESU and associated population viability criteria. The time frame for completion of this work is uncertain.

There are 30 occupied HSA watersheds within the freshwater and estuarine range of this ESU. In addition, to twenty nine HSA watershed units, a conservation assessment was also made for Morro Bay (a separate HSA unit) which provides rearing and migration PCEs for this ESU. For ease of reference these watersheds have been aggregated into 8 larger subbasin units or CALWATER HUs. There are approximately 1,261 mi of occupied stream and estuarine habitat within these occupied HSA watersheds that meet the definition of critical habitat for this ESU. Six HSA watersheds received a low rating, 11 received a medium rating, and 13 received a high rating of conservation value to the ESU (NMFS, 2004b). Appendix Map A4 shows the conservation ratings by watershed for this ESU.

#### Military and Indian Lands

There are two DOD facilities controlled by the military or designated for its use and covered by an INRMP with occupied stream habitat within the range of this ESU: Camp San Luis Obispo and Camp Roberts. Altogether these military lands contain about 21 miles of occupied habitat, or 1.5 percent of the total-stream miles occupied in this ESU. We have not calculated the potential reduction in estimated economic impact as a result of these exclusions, but expect it would be small given the small percentage of stream miles these exclusions represent for the ESU as a whole. In separate documents we have determined that the military's management of these lands provides benefits to the listed ESU, and therefore, the occupied stream reaches within these military lands do not qualify for designation. There are no Indian lands within the range of this ESU that contain occupied stream habitat.

#### Consideration of Economic Impacts and Recommendations for Exclusions

Appendix Table B4 shows the estimated total economic impacts for each of the occupied HSA habitat areas. The total potential estimated economic impact is \$10,084,293. Of the 6 low-value habitat areas, 1 exceeded the Scenario 3 economic impact criteria, making it eligible for exclusion. The CHART team, however, determined that the exclusion of this HSA (330920) would impede the conservation of the ESU, and therefore, it should be retained in the designation (see memorandum in Appendix D). Specifically, the CHART determined that the the only occupied stream habitat in the HSA (i.e. Galiban Creek) has the potential to contribute significantly to the conservation of this ESU. Of the 11 medium-value habitat areas, two exceeded the Scenario 3 criteria. Similarly, CHART team members determined that exclusion of both these habitat areas (HSAs 330970 and 331031) would impede conservation of this ESU. HSA 330970 contains the upper portion of Galiban Creek, which is the only occupied stream habitat in the watershed, and the CHART concluded that it has the potential to contribute significantly to the conservation of the ESU (see memorandum in Appendix D). HSA 330131 contains Arroyo Grande Creek in the southern portion of the ESU and the CHART concluded this occupied habitat provides important conservation benefits to the southern portion of this ESU (see memorandum in Appendix D).

In summary, we recommend that no low or medium conservation value habitat areas in this ESU be proposed for exclusion because the economic benefits of exclusion do not outweigh the benefits of designation. Exclusion of any of these areas alone, or of all areas in combination, would significantly impede conservation of this ESU. Appendix Map C4 shows those habitat areas being recommended for designation. Because no low or medium conservation value habitat areas are proposed for exclusion, there is no reduction in estimated economic impact for this ESU. The exclusion of occupied stream habitat on DOD lands represents approximately 1.5 percent of the total stream miles occupied by this ESU. Because there are no exclusions as a result of the two-step balancing process for economic impacts, the total estimated economic is unchanged (i.e. \$10,084,293). The habitat areas being recommended for designation as critical habitat include approximately 1,240 stream miles. The recommended critical habitat designation for this ESU will complement recovery planning efforts aimed at conserving the geographic distribution and diversity of this ESU.

#### 5. Southern California (SC) *O. mykiss* ESU

The SC O. mykiss ESU was listed as an endangered species in 1997 (62 FR 43937; August 18, 1997). In 2002, the status of the ESU was updated and its range extended based on new information indicating that anadromous O. mykiss had re-colonized watersheds from which it was thought to have been extirpated (67 FR 21586; May 1, 2002). The SC O. mykiss ESU includes all naturally spawned populations of O. mykiss in coastal river basins from the Santa Maria River in San Luis Obispo County southward to the U.S. - Mexican Border (67 FR 21586). Major coastal watersheds occupied by naturally spawning fish in this ESU include the Santa Maria, Santa Ynez, Ventura, and Santa Clara Rivers. Several smaller streams in Santa Barbara, Ventura and northern Los Angeles County also support naturally spawning steelhead, as do two watersheds (San Juan Creek and San Mateo Creek) in southern Orange County and northern San Diego County. These southernmost populations are disjunct in distribution and are separated from the northernmost populations by approximately 80 miles (128 km). Based on an updated status review (NMFS 2003a), NMFS recently proposed that the ESU remain listed as an endangered species (69 FR 33102; June 14, 2004). In addition, NMFS proposed that resident O. mykiss occurring with anadromous populations below impassable barriers (both natural and man made) also be included in the ESU. A Technical Recovery Team has been formed for the South-Central coast of California and is in the process of identifying the historical and extant independent population structure of this ESU and the SCCC O. mykiss ESU, as well as the associated viability criteria for these populations.

There are 37 occupied HSA watersheds within the freshwater and estuarine range of this ESU. For ease of reference these watersheds have been aggregated into 8 larger subbasin units or CALWATER HUs. There are approximately 837 mi of occupied stream and estuarine habitat within these occupied HSA watersheds that meet the definition of critical habitat for this ESU. Six HSA watersheds received a low rating, 6 received a medium rating, and 25 received a high rating of conservation value to the ESU (NMFS, 2004b). Appendix Map A5 show the conservation ratings by watershed for this ESU.

#### Military and Indian Lands

There are two DOD facilities controlled by the military or designated for its use and covered by an INRMP with occupied stream habitat within the range of this ESU: Camp Pendleton Marine Corps Base and Vandenberg Air Force Base. Altogether these DOD facilities contain about 20 miles of occupied habitat, or 2.4 percent of the total stream miles occupied in this ESU. We have not calculated the potential reduction in estimated economic impact as a result of these exclusions, but expect it would be small given the small percentage of stream miles these exclusions represent for the ESU as a whole. In separate documents we have determined that the military's management of these lands provides benefits to the listed ESU. The occupied lands on Camp Pendleton and Vandenberg AFB, therefore, do not qualify for designation because their INRMPs provides benefits to the listed ESU. Based on information provided by the military we have concluded that designation of critical habitat on these facilities will impede military readiness and thereby impact national security. Accordingly, we have concluded that the benefits of excluding these areas from a potential designation outweigh the benefits of their inclusion. There are no Indian lands within the range of this ESU that contain occupied stream habitat.

#### Consideration of Economic Impacts and Recommendations for Exclusions

Appendix Table B5 shows the estimated total economic impacts for each of the occupied HSA habitat areas. The total potential estimated economic impact is \$21,008,746. Of the 6 low-value habitat areas, 5 exceeded the Scenario 3 economic impact criteria, making them eligible for exclusion. In two cases (HSAs 331210 and 331430), the watersheds contain migratory corridor habitat of high or medium conservation value which the CHART team concluded was essential for conservation. Exclusion of tributary habitat in these watersheds, however, was determined to not impede the conservation of the ESU. In both instances, the benefits of excluding the tributary habitat was estimated. In the case of HSA 331210, the migratory habitat that is essential to conservation is the mainstem Santa Maria River which provides connectivity to the high conservation value Sisquoc River watershed (HSA 331220) which is upstream. In the case of HSA 331430, the migratory habitat is a portion of the mainstem Santa Ynez River which provide connectivity to O. mykiss populations in that watershed. One additional HSA (490121) exceeded the cost threshold, but contains small portions (less than 1 mile) of the mainstem of Trabuco Creek in south Orange county. Most of the Trabuco Creek watershed and the mainstem occurs in two other high conservation value HSAs (490122 and 490123), and therefore, that portion of the creek in HSA 490121 provides migratory connectivity to the ocean for the population in this watershed. Because there is very little occupied habitat in HSA 490121, the estimated economic costs for this watershed are expected to be substantially overestimated. Of the 6 medium-value habitat areas, one exceeded the Scenario 3 criteria.

In summary, we recommend that 4 low conservation value habitat areas (two entire watersheds and two tributary only watersheds) and 1 medium-value habitat area be proposed for exclusion because the economic benefits of exclusion outweigh the benefits of designation. Appendix Map C5 shows those habitat areas being recommended for exclusion. They include 33 total occupied stream miles, representing approximately 4 percent of the total stream miles occupied by the ESU. The reduction in estimated economic impact is approximately 39 percent of the impact that would occur if all habitat areas were designated. Combined with the excluded habitat areas on DOD, the total stream miles not recommended for designation represent approximately 6 percent of the total stream miles occupied by this ESU. After exclusions the total estimated economic impact is \$12,716,386.

We have concluded that exclusion of any of these areas alone, or of all areas in combination, would not significantly impede conservation of this ESU. The habitat areas being recommended for designation as critical habitat include approximately 784 stream miles. The recommended critical habitat designation for this ESU will complement recovery planning efforts aimed at conserving the geographic distribution and diversity of this ESU.

#### 6. Central Valley (CV) spring-run chinook ESU

The CV spring-run chinook ESU was listed as a threatened species in 1999 (64 FR 50394). The ESU includes all naturally spawned populations of spring-run chinook salmon in the Sacramento River and its tributaries. The agency recently conducted a review to update the ESU's status, taking into account new information and considering the net contribution of artificial propagation efforts in the ESU (NMFS 2003a). A single artificially propagated spring-run chinook stock resides within the historical geographic range of the ESU (Feather River Hatchery spring run chinook program), but it is not

considered part of the ESU because of introgression with fall run chinook salmon (NMFS 2003b). NMFS has recently proposed that the CV spring run chinook ESU remain listed as a threatened species (69 FR 33102; June 14, 2004). No artificial propagation programs were proposed for listing.

A Technical Recovery Team has been established for the Central Valley recovery planning domain and it has identified historic and extant demographically independent populations of spring chinook (NMFS 2004; NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-370). The TRT divided the range of the spring-run chinook ESU into four geographic groups. Geographic areas in each group inhabit similar environments based on a principle components analysis of environmental variables. The four geographic groups are the southern Cascades, northern Sierra, southern Sierra, and Coast Range. The TRT identified at least eighteen historically demographically independent populations of spring run chinook distributed among these four geographic areas, plus an additional seven likely dependent populations that may have been strongly influenced by adjacent independent population. Three of the eighteen independent populations are extant (Mill, Deer and Butte Creek populations) and all occur in the Southern Cascade geographic area. Several extant dependent populations have intermittent runs of spring chinook including Big Chico, Antelope, and Beegum Creeks. Recovery planning will likely emphasize the need for having viable populations distributed across the range of the identified geographic areas (Ruckelshaus et al. 2002, McElhany et al. 2003). Recovery planning efforts are currently focused on working with the CalFed and Central Valley Project Improvement Act programs to implement habitat restoration projects and other recovery related efforts in the Central Valley. The CHART team considered the TRT products in rating each watershed and also solicited input from the TRT on the distributional and habitat use information that was compiled as well as the conservation assessment of occupied HSAs.

There are 37 occupied HSA watersheds within the freshwater and estuarine range of this ESU. For ease of reference these watersheds have been aggregated into 15 larger subbasin units or CALWATER HUs. These include four HSAs that encompass the San Francisco - San Pablo - Suisun Bay complex which constitutes rearing and migration habitat for this ESU. There are approximately 1,381 mi of occupied stream and 427 mi<sup>2</sup> of estuarine habitat within these occupied HSA watersheds that meet the definition of critical habitat for this ESU. Eight HSA watersheds received a low rating, 4 received a medium rating, and 25 received a high rating of conservation value to the ESU (NMFS, 2004b). Appendix Map A6 shows the conservation ratings by watershed for this ESU.

#### Military and Indian Lands

There are no lands controlled by the military or designated for its use and covered by an INRMP within the freshwater range of Central Valley spring run chinook that contain occupied riverine habitat. Similarly, there are no Indian lands within the range of this ESU that overlap with the known areas of occupancy.

#### Consideration of Economic Impacts and Recommendations for Exclusions

Appendix Table B6 shows the estimated total economic impacts for each of the occupied HSA habitat areas. The total potential estimated economic impact is \$23,577,391. Of the 8 low-value habitat areas, 5 exceeded the Scenario 3 economic impact criteria, making them eligible for exclusion. The CHART team concluded that exclusion of these habitat

areas would not impede conservation of the ESU. In addition, the CHART concluded that another low value habitat area which did not exceed the impact threshold could be excluded without impeding conservation of the ESU. Of the 4 medium-value habitat areas, 2 exceeded the Scenario 3 criteria. The CHART team concluded that exclusion of these habitat areas would not impede conservation of the ESU. Lastly, the CHART team concluded that a portion of one high-value habitat area (HSA 551000) could be excluded. Specifically, the CHART team concluded that the Sacramento River Deep Water Ship Channel which is an artificial structure in this HSA watershed did not provide any conservation value to the ESU and therefore could be excluded.

In summary, we recommend that 6 low conservation value habitat areas, 2 medium-value habitat areas, and part of one high-value habitat area be proposed for exclusion because the economic benefits of exclusion outweigh the benefits of designation. Appendix Map C6 shows those habitat areas being recommended for exclusion. They include approximately 231 occupied stream miles, as well as portions of San Francisco Bay (approximately 170 sq. mi, which represents approximately 17 percent of the total stream miles occupied by the ESU. The reduction in estimated economic impact is approximately 29 percent of the impact that would occur if all habitat areas were designated. After exclusions the total estimated economic impact is \$16,787,737.

We have concluded that exclusion of any of these areas alone, or of all areas in combination, would not significantly impede conservation of the Central Valley spring run chinook salmon ESU. The habitat area being recommended for designation as critical habitat comprises approximately 1,150 stream miles occupied by this ESU. These habitat areas are well distributed across the geographic area occupied by the ESU and the demographically independent populations that comprise the ESU. The recommended critical habitat designation for this ESU will complement recovery planning efforts aimed at conserving the geographic distribution and diversity of this ESU.

#### 7. Central Valley (CV) O. mykiss ESU

The CV O. mykiss ESU was listed as a threatened species in 1998 (63 FR 13347; March 19, 1998). The ESU includes all naturally spawned populations of O. mykiss in the Sacramento and San Joaquin Rivers and their tributaries, but excludes O. mykiss from San Francisco and San Pablo Bays and their tributaries. Based on an updated status review (NMFS 2003a) and an assessment of hatchery populations located within the range of the ESU (NMFS 2003b), NMFS recently proposed that the ESU remain listed as a threatened species (69 FR 33102; June 14, 2004). In addition, NMFS proposed that resident O. mykiss occurring with anadromous populations below impassable barriers (both natural and man made) and two artificially propagated populations (Coleman National Fish Hatchery on Battle Creek and Feather River Hatchery on the Feather River) also be included in the CV O. mykiss ESU. Two artificially propagated O. mykiss stocks reside within the historical geographic range of the ESU (Nimbus Fish Hatchery on the American River and Mokelumne River Hatchery on the Mokelumne River), but are not considered part of the ESU because they are derived from out-of-ESU broodstock (69 FR 33102; June 14, 2004). A Technical Recovery Team has been established for the Central Valley recovery planning domain and is in the process of identifying the historical and extant independent population structure of this ESU as well as the associated viability criteria for these populations.

There are 67 occupied HSA watersheds within the freshwater and estuarine range of this ESU. Of these sixty-seven HSA watersheds, four encompass the San Francisco - San Pablo - Suisun Bay complex which represents a rearing and migratory corridor for this ESU. For ease of reference these watersheds have been aggregated into 25 larger subbasin units or CALWATER HUs. There are approximately 2,607 mi of occupied stream and estuarine habitat within these occupied HSA watersheds that meet the definition of critical habitat for this ESU. Fourteen HSA watersheds received a low rating, 16 received a medium rating, and 37 received a high rating of conservation value to the ESU (NMFS, 2004b). Appendix Map A7 shows the conservation ratings by watershed for this ESU.

#### Military and Indian Lands

There are no lands controlled by the military or designated for its use and covered by an INRMP within the spawning range of this ESU. Similarly, there are also no Indian reservations within this range.

#### Consideration of Economic Impacts and Recommendations for Exclusions

Appendix Table B7 shows the estimated total economic impacts for each of the occupied HSA habitat areas. The total potential estimated economic impact is \$29,187,888. Of the 14 low-value habitat areas, 8 exceeded the Scenario 3 economic impact criteria, making them eligible for exclusion. The CHART team concluded that exclusion of these habitat areas would not impede conservation of the ESU. In addition, the CHART concluded that two additional low value habitat area which did not exceed the impact threshold could be excluded without impeding conservation of the ESU. Of the 16 medium-value habitat areas, 5 exceeded the Scenario 3 criteria. The CHART team concluded that exclusion of four of these habitat areas (HSAs 552433, 552436, and 553590, 551422) would impede conservation of the ESU, and therefore, should not be excluded (see memorandum in Appendix D). In addition, the CHART concluded that two additional medium value habitat areas which did not exceed the impact threshold could be fully (HSA 551110) or partially excluded (HSA 553120) without impeding the conservation of the ESU. The partial exclusion in HSA 553120 resulted in the exclusion of Mosher Creek but the inclusion of portions of the Mokelumne River. The benefits of this partial exclusion could not be estimated, therefore, there was no benefit of exclusion associated with this HSA. Lastly, the CHART team concluded that a portion of one high-value habitat area (HSA 551000) could be excluded. Specifically, the CHART team concluded that the Deep Water Ship Channel which is an artificial structure in this HSA watershed did not provide any conservation value to the ESU, and therefore, could be excluded

In summary, we recommend that 10 low conservation value habitat areas, 3 medium-value habitat areas (two fully and one partially), and part of one high-value habitat area be proposed for exclusion because the economic benefits of exclusion outweigh the benefits of designation. Appendix Map C7 shows those habitat areas being recommended for exclusion. They include approximately 290 occupied stream miles, as well as portions of San Francisco Bay which represents approximately 11 percent of the total stream miles occupied by the ESU. The reduction in estimated economic impact is approximately 17 percent of the impact that would occur if all habitat areas were designated. After exclusions the total estimated economic impact is \$24,195,245.

We have concluded that exclusion of these habitat areas would not significantly impede conservation of this ESU. The habitat area being recommended for designation as critical habitat comprises approximately 2,317 stream miles occupied by this ESU. The recommended critical habitat designation will complement recovery planning efforts aimed at conserving the geographic distribution and diversity of the populations in this ESU.

#### IV. REFERENCES

- National Marine Fisheries Service (NMFS). 1996. Status Review of West Coast Steelhead from Washington, Idaho, Oregon, and California. NOAA Technical Memorandum NMFS-NWFSC-27. August 1996.
- National Marine Fisheries Service (NMFS). 2003a. Updated Status of Federally Listed ESUs of West Coast Salmon and Steelhead. West Coast Salmon Biological Review Team Report. July 2003.
- National Marine Fisheries Service (NMFS). 2003b. Hatchery Broodstock Summaries and Assessments for Chum, Coho and Chinook Salmon and Steelhead Stocks within ESUs listed under the Endangered Species Act. May 2003.
- National Marine Fisheries Service (NMFS). 2004. Population Structure of Threatened and Endangered Chinook Salmon ESUs in California's Central Valley. NOAA Technical Memorandum NMFS-SWFSC-370. April 2004.
- National Marine Fisheries Service (NMFS). 2004b. Preliminary Findings of NOAA Fisheries's SWR Critical Habitat Development and Review Teams for seven ESUs of salmon and Q. mykiss in California. October 2004.
- National Marine Fisheries Service (NMFS) 2004c. Draft Economic Analysis of Critical Habitat Designations for seven salmon and Q. mykiss ESUs in California. October 2004.
- Office of Management and Budget (OMB). 2003. Circular A-4. September 17, 2003.
- Federal Register Citations:*
- 62 FR 43937 - 1997: Final Listing Determinations for Central California Coast Steelhead, South-Central California Coast Steelhead, and Southern California Steelhead
- 63 FR 13347 - 1998: Final Listing Determination for Central Valley Steelhead
- 65 FR 50394 - 1999: Final Listing Determination for California Coastal Chinook and Central Valley spring-run Chinook
- 65 FR 7764 - 2000: Final Critical Habitat Designation for 19 ESUs of west coast Salmon and Steelhead
- 65 FR 36074 - 2000: Final Listing Determination for Northern California Steelhead

67 FR 21586 - 2002: Range Extension and Status Review Update for Southern California Steelhead

68 FR 55926 - 2003: Advance Notice of Proposed Rulemaking for Critical Habitat

69 FR 33102 - 2004: Proposed Listing Determinations for 27 ESUs of West Coast Salmon and O. mykiss

Appendix A maps A1-A7: Maps Illustrating CALWATER HSA Watershed Conservation Ratings for 7 ESUs of Salmon and O. mykiss in California

Map A1 - California Coastal chinook ESU

Map A2 - Northern California O. mykiss ESU

Map A3 - Central California Coast O. mykiss ESU

Map A4 - South-Central California Coast O. mykiss ESU

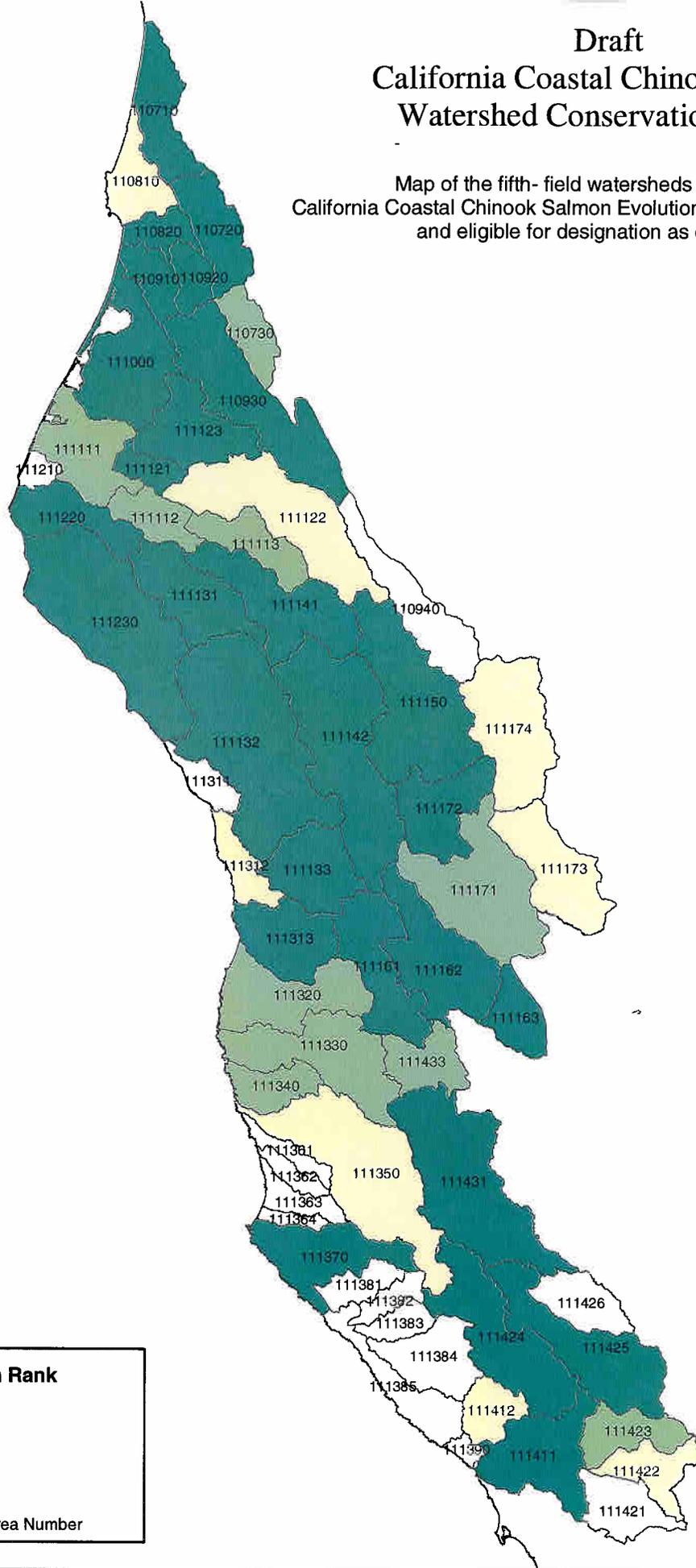
Map A5 - Southern California O. mykiss ESU

Map A6 - Central Valley spring-run chinook ESU

Map A7 - Central Valley O. mykiss ESU

# Draft California Coastal Chinook Salmon Watershed Conservation Rating

Map of the fifth- field watersheds occupied by the California Coastal Chinook Salmon Evolutionarily Significant Unit (ESU) and eligible for designation as critical habitat.



0 5 10 15 20 Miles

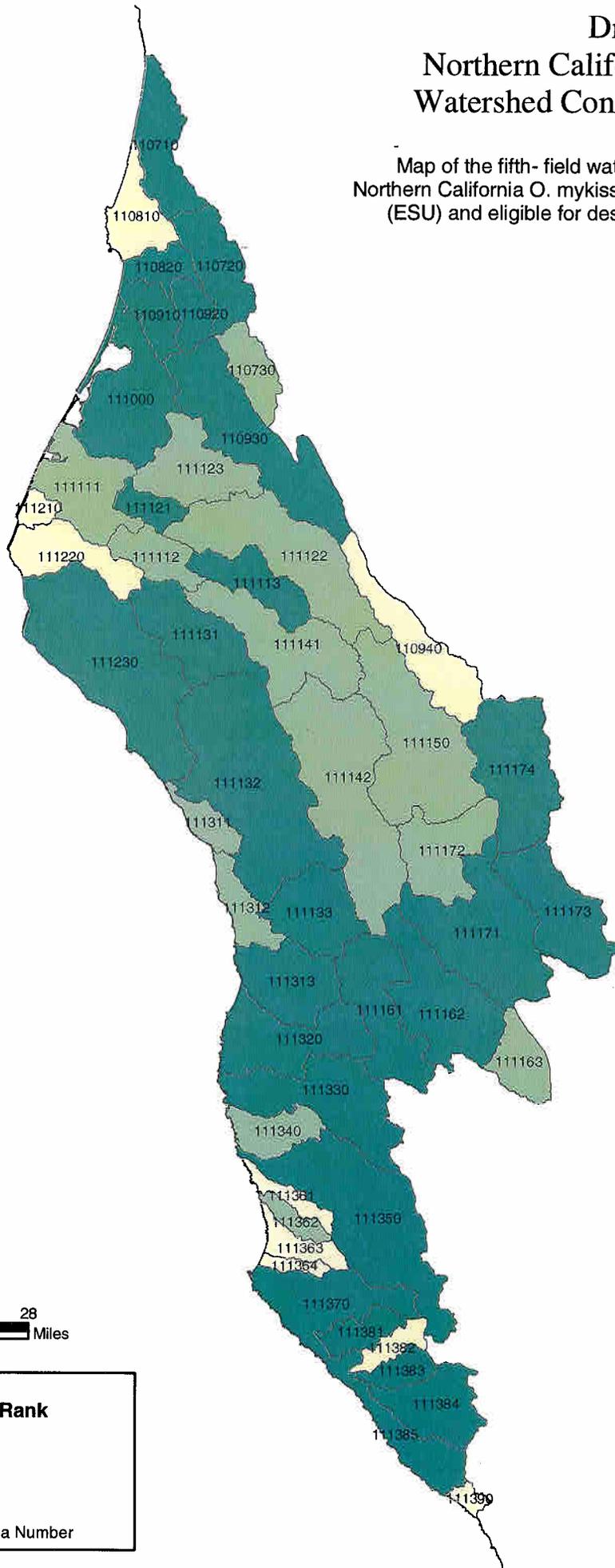
## Hydrologic Sub- Area Rank

- High
- Medium
- Low
- Not Ranked

110701 Hydrologic Sub-Area Number

# Draft Northern California *O. mykiss* Watershed Conservation Rating

Map of the fifth- field watersheds occupied by the Northern California *O. mykiss* Evolutionarily Significant Unit (ESU) and eligible for designation as critical habitat.



**Hydrologic Sub- Area Rank**

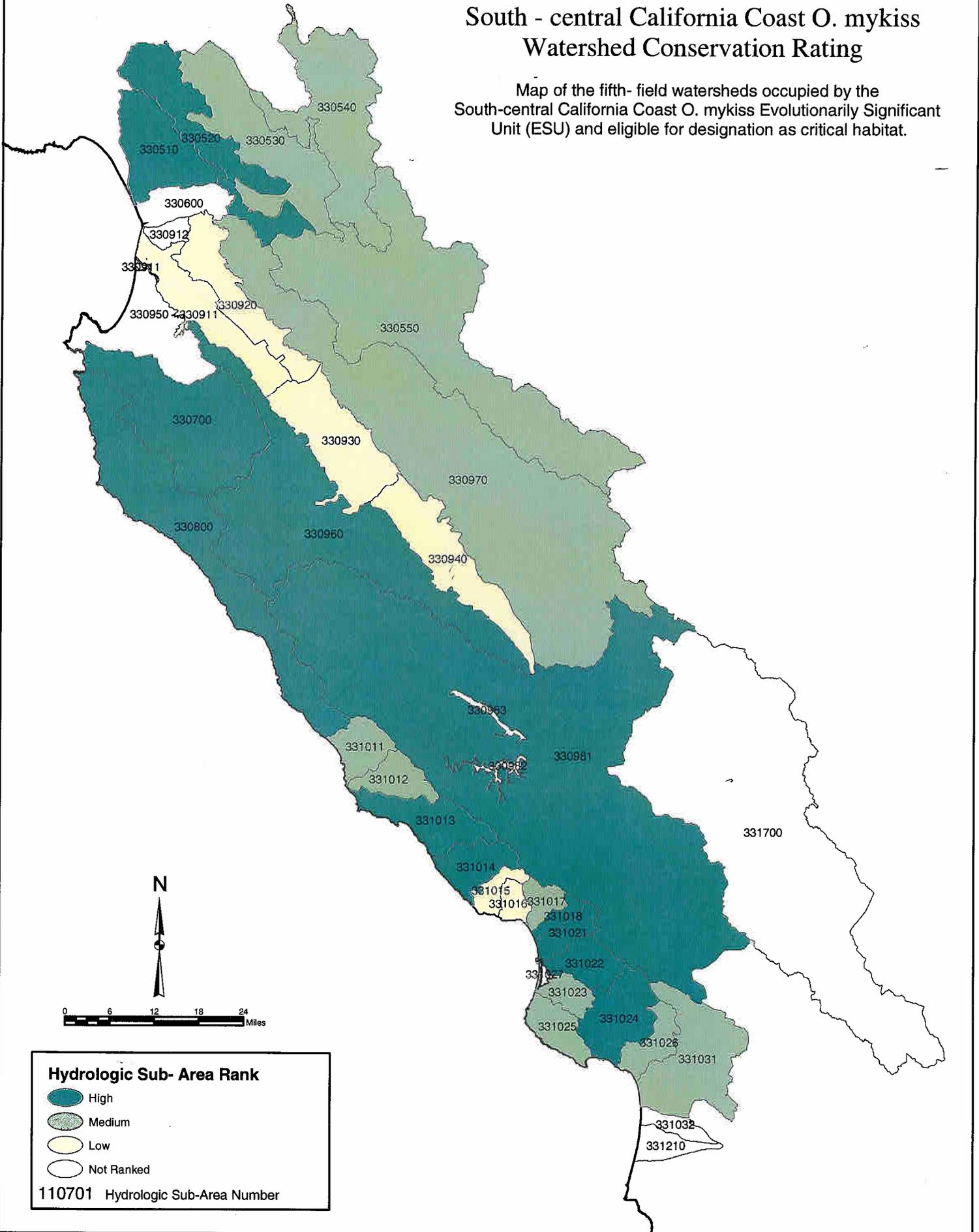
- High
- Medium
- Low

110701 Hydrologic Sub-Area Number



Draft  
South - central California Coast *O. mykiss*  
Watershed Conservation Rating

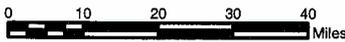
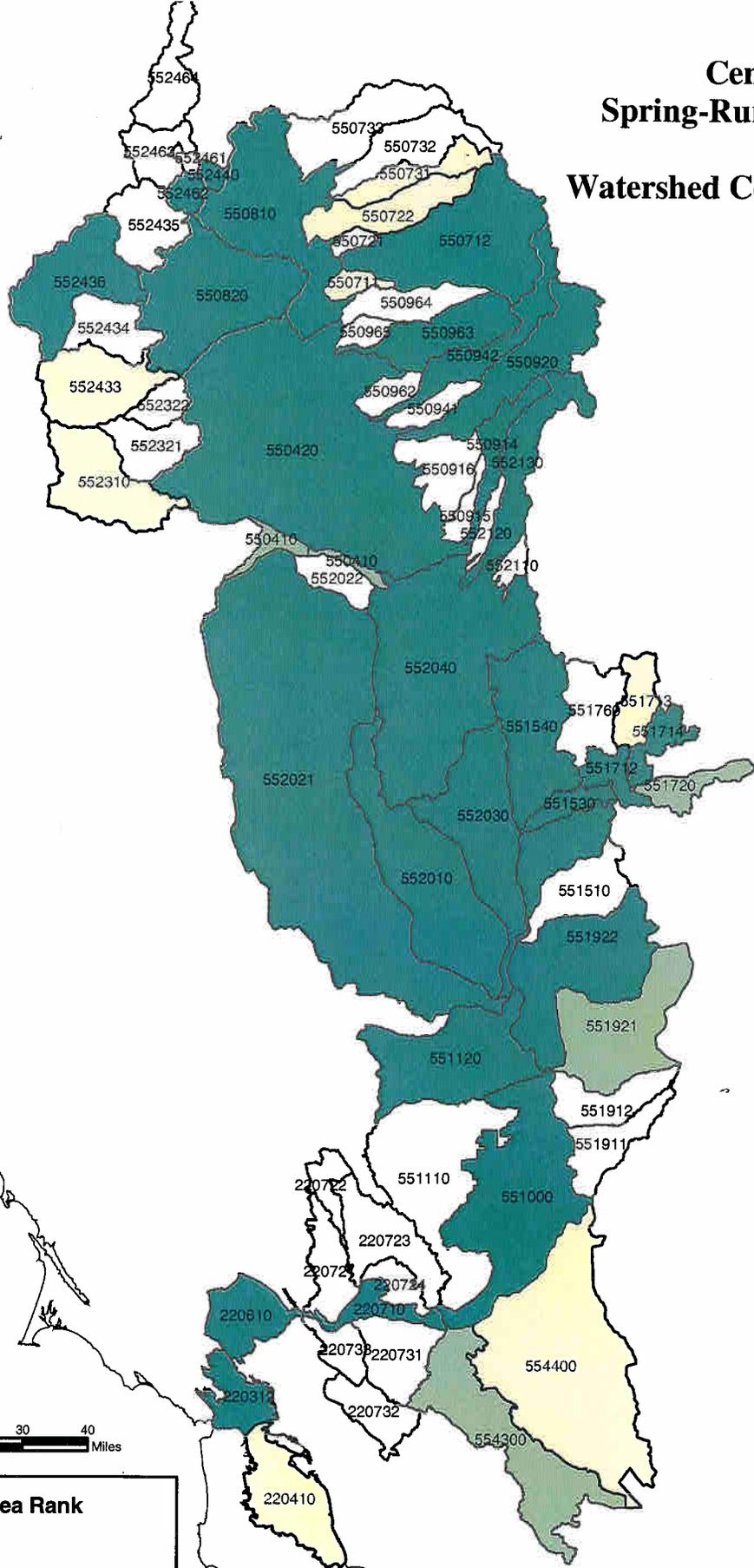
Map of the fifth- field watersheds occupied by the  
South-central California Coast *O. mykiss* Evolutionarily Significant  
Unit (ESU) and eligible for designation as critical habitat.





# Draft Central Valley Spring-Run Chinook Salmon

## Watershed Conservation Ranking



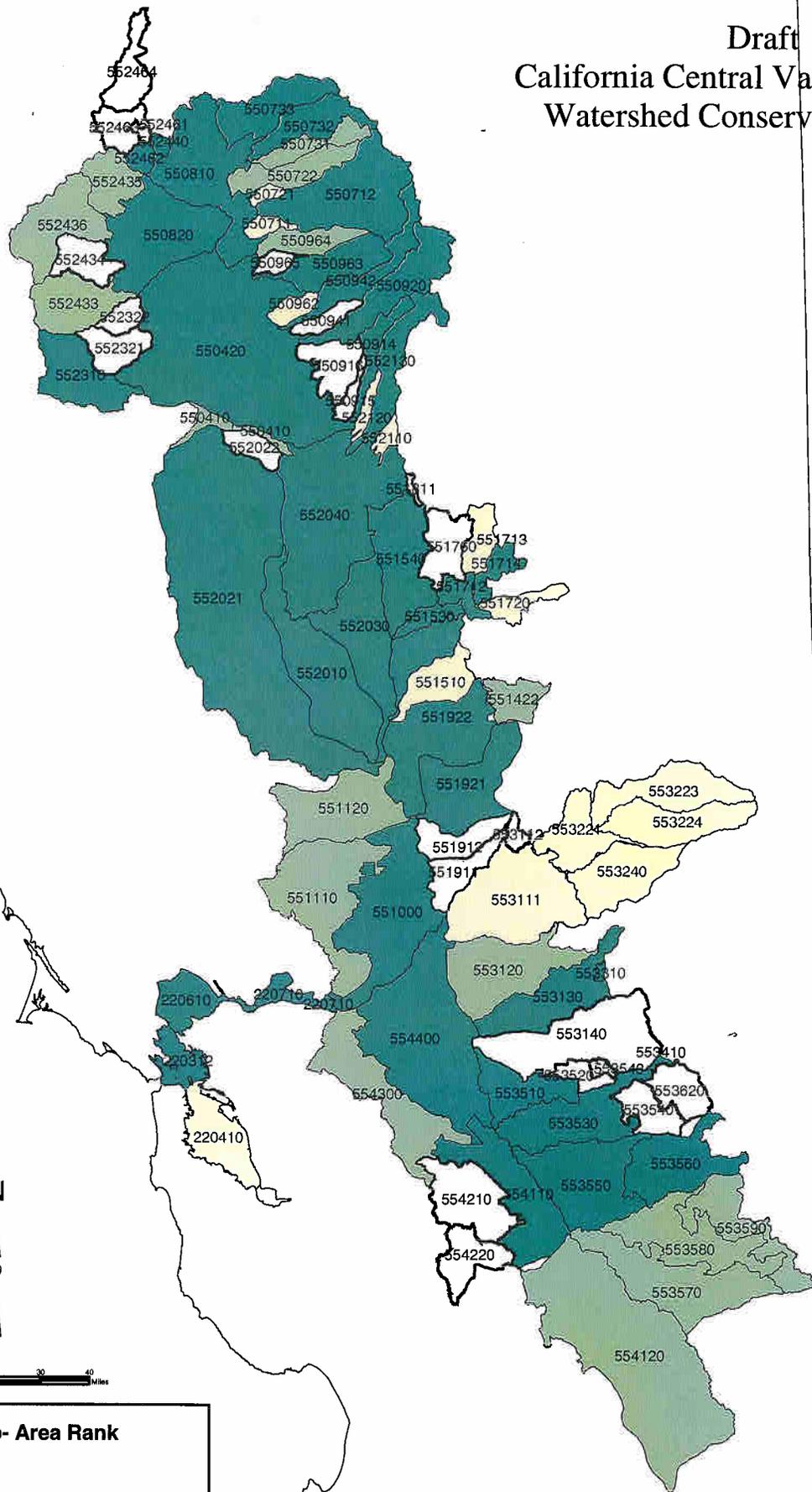
**Hydrologic Sub- Area Rank**

- High
- Medium
- Low
- Not Ranked

110701 Hydrologic Sub-Area Number

Map of the fifth-field watersheds occupied by the Central Valley Spring-Run Chinook Salmon Evolutionarily Significant Unit (ESU) and eligible for designation as critical habitat.

Draft  
California Central Valley *O. mykiss*  
Watershed Conservation Rating



**Hydrologic Sub- Area Rank**

- High
- Medium
- Low
- Not Ranked

110701 Hydrologic Sub-Area Number

Map of the fifth- field watersheds occupied by the California Central Valley *O. mykiss* Evolutionarily Significant Unit (ESU) and eligible for designation as critical habitat.

Appendix B Tables B1 - B7: Conservation Ratings, Economic Impacts, and Potential Exclusions for occupied CALWATER HSA Watersheds for 7 ESUs of Salmon and O. mykiss in California.

Table B1 - California Coastal chinook ESU

Table B2 - Northern California O. mykiss ESU

Table B3 - Central California Coast O. mykiss ESU

Table B4 - South-Central California Coast O. mykiss ESU

Table B5 - Southern California O. mykiss ESU

Table B6 - Central Valley spring-run chinook ESU

Table B7 - Central Valley O. mykiss ESU

**Table B1. Conservation Ratings, Economic Impacts and Potential Exclusions for CC Chinook ESU**

CalWater Unit	Impact Score	Annual Cost (\$/yr)	Cons. Value	Exceeds Threshold?	CHART Recommendation and Exclusion Benefit
110810	11	\$10,603		Low	
111122	469	\$468,511		Low	Yes Ok to exclude - \$468,511
111173	938	\$938,185		Low	Yes Ok to exclude - \$938,185
111174	1,552	\$1,551,751		Low	Yes Ok to exclude - 1,551,751
111312	1	\$1,360		Low	
111350	47	\$47,468		Low	
111412	25	\$24,502		Low	
111422	269	\$268,627		Low	Yes Ok to exclude - \$268,627
<b>N = 8</b>		<b>\$3,311,008</b>			<b>\$3,227,074</b>
110730	20	\$20,026		Medium	
111111	85	\$84,996		Medium	
111112	12	\$11,963		Medium	
111113	5	\$5,005		Medium	
111171	838	\$838,090		Medium	Yes Ok to exclude - \$838,090
111320	40	\$40,008		Medium	
111330	12	\$11,825		Medium	
111340	0	\$0		Medium	
111423	214	\$213,518		Medium	
111433	34	\$34,323		Medium	
<b>N = 10</b>		<b>\$1,259,753</b>			<b>\$838,090</b>
110710	0	\$0		High	
110720	30	\$30,444		High	
110820	0	\$0		High	
110910	58	\$58,370		High	
110920	1	\$1,360		High	
110930	357	\$357,316		High	
111000	168	\$167,755		High	
111121	0	\$0		High	
111123	8	\$8,123		High	
111131	6	\$6,243		High	
111132	248	\$247,769		High	

111133	89	\$89,278	High	
111141	116	\$115,946	High	
111142	109	\$109,105	High	
111150	819	\$818,958	High	
111161	164	\$163,599	High	
111162	401	\$400,861	High	
111172	67	\$67,335	High	
111220	27	\$26,716	High	
111230	554	\$553,863	High	
111313	3	\$2,849	High	
111370	27	\$26,947	High	
111411	111	\$111,345	High	
111424	88	\$88,483	High	
111425	307	\$306,599	High	
111431	496	\$495,782	High	
BE_Eel River_Estua	0	\$0	High	Note; a specially created poyogon
BE_Humboldt_Bay	192	\$191,799	High	Note; a specially created poyogon
111163	2,634	\$2,634,115	High	

**N = 20** \$7,080,962

Total ESU Cost	\$11,651,723	
Total Exclusions	\$4,065,164	35.00%
Designation Cost	\$7,586,559	65.00%

**Table B2. Conservation Ratings, Economic Impacts and Potential Exclusions for NC O. mykiss ESU**

CalWater Unit	Impact Score	Annual Cost (\$/yr)	Cons. Value	Exceeds Threshold?	CHART Recommendations and Exclusion Benefit
110810	11	\$10,603		Low	
110940	701	\$701,020		Low	Yes Ok to exclude - \$701,020
111210	0	-		Low	
111220	27	\$26,716		Low	
111361	0	-		Low	
111363	0	-		Low	
111364	1	\$583		Low	
111382	0	-		Low	
111390	0	-		Low	
<b>N = 9</b>		<b>\$738,922</b>			<b>\$701,020</b>
110730	20	\$20,026		Medium	
111111	85	\$84,996		Medium	
111112	12	\$11,963		Medium	
111122	469	\$468,511		Medium	Yes Do not exclude - see Van Duzen Memo in App D
111123	8	\$8,123		Medium	
111141	116	\$115,946		Medium	
111142	109	\$109,105		Medium	
111150	819	\$818,958		Medium	Yes Ok to exclude - \$818,958
111172	67	\$67,335		Medium	
111311	0	\$399		Medium	
111312	1	\$1,360		Medium	
111340	0	\$0		Medium	
111362	0	\$0		Medium	
111163	2,634	\$2,634,115		Medium	Yes Ok to exclude- \$2,634,115
<b>N = 14</b>		<b>\$4,340,838</b>			<b>\$3,453,073</b>
110710	0	\$0		High	
110720	30	\$30,444		High	
110820	0	\$0		High	
110910	58	\$58,370		High	
110920	1	\$1,360		High	

110930	357	\$357,316	High
111000	168	\$167,755	High
111113	5	\$5,005	High
111121	0	\$0	High
111131	6	\$6,243	High
111132	248	\$247,769	High
111133	89	\$89,278	High
111161	164	\$163,599	High
111162	401	\$400,861	High
111171	838	\$838,090	High
111173	938	\$938,185	High
111174	1,552	\$1,551,751	High
111230	554	\$553,863	High
111313	3	\$2,849	High
111320	40	\$40,008	High
111330	12	\$11,825	High
111350	47	\$47,468	High
111370	27	\$26,947	High
111381	0	\$0	High
111383	0	\$0	High
111384	21	\$21,209	High
111385	11	\$10,603	High
BE_Eel River_Estua	0	\$0	High
BE_Humboldt_Bay	192	\$191,799	High

Note: specially created polygon  
Note: specially created polygon

N = 29 \$5,762,597

Total ESU Cost	\$10,842,357	38.00%
Total Exclusions	\$4,154,093	62.00%
Designation Cost	\$6,688,254	

**Table B3. Conservation Ratings, Economic Impacts and Potential Exclusions for CCC O. mykiss ESU**

CalWater Unit	Impact Score	Annual Cost (\$/yr)	Cons. Value	Exceeds Threshold?	CHART Recommendation and Exclusion Benefit
111421	55	\$54,839		Low	
111530	1	\$1,360		Low	
220120	0	\$0		Low	
220130	0	\$0		Low	
220221	12	\$12,340		Low	
220330	93	\$93,445		Low	Yes Ok to exclude - \$93,445
220440	482	\$482,295		Low	Yes Ok to exclude - \$482,295
220540	547	\$547,315		Low	Yes Ok to exclude - \$547,315
220620	242	\$242,492		Low	Yes Ok to exclude - \$242,492
220660	113	\$113,479		Low	Yes Ok to exclude - \$113,479
220721	430	\$430,017		Low	Yes Ok to exclude - \$430,017
220731	202	\$201,503		Low	Yes Ok to exclude - \$201,503
220733	231	\$230,628		Low	Yes Ok to exclude - \$230,628
220710	388	\$388,483		Low	Yes Ok to exclude - \$388,483
N = 14		\$2,798,195			\$2,729,657
111422	269	\$268,627		Medium	Yes Ok to exclude - 268,627
111431	496	\$495,782		Medium	Yes Partial exclusion; footnote (1) and App D - \$469,000
111510	0	\$0		Medium	
220112	154	\$153,897		Medium	
220222	55	\$55,100		Medium	
220223	0	\$0		Medium	
220320	74	\$74,411		Medium	
220420	434	\$433,698		Medium	
220530	629	\$628,633		Medium	
220550	244	\$243,545		Medium	
220630	112	\$112,016		Medium	Yes Partial exclusion (footnote (2) - \$408,000
220722	127	\$127,230		Medium	Yes Do not exclude - Coyote Cr memo in App D
330420	43	\$43,329		Medium	
N = 15		\$2,636,268			\$1,145,627
111411	111	\$111,345		High	
111412	25	\$24,502		High	

111423	214	\$213,518	High
111424	88	\$88,483	High
111425	307	\$306,599	High
111426	32	\$32,192	High
111433	34	\$34,323	High
220113	214	\$213,889	High
220230	0	\$0	High
220240	22	\$22,254	High
220430	591	\$591,258	High
220640	69	\$69,139	High
220650	684	\$684,401	High
330411	46	\$46,490	High
330412	178	\$178,377	High
330413	29	\$28,946	High
220312	508	\$507,863	High
220410	618	\$617,688	High
220510	0	\$0	High
220610	122	\$122,266	High

N = 20 \$3,893,533

Total ESU Cost	\$9,327,996	
Total Exclusions	\$3,875,284	42.00%
Designation Cost	\$5,452,712	58.00%

Footnote (1) 111431 - migration cooridor and Pieta Creek only retained. Using Plummer method, tributary activity cost only are benefit of exclusion

Footnote (2) 220420 - migration corridor only retainedto provide connectivity to 220430. Using Plummer method, tributary activity cost only are benefit of exclusion

**Table B4. Conservation Ratings, Economic Impacts, and Potential Exclusions for SCCO. mykiss ESU**

CalWater Unit	Impact Score	Annual Cost (\$/yr)	Cons. Value	Exceeds Threshold?	CHART Recommendations and Exclusion Benefit
330930	6	\$5,606		Low	
330940	2	\$2,316		Low	
331015	13	\$13,472		Low	
331016	59	\$59,096		Low	
330920	95	\$95,236		Low	Yes Do not exclude - see App D (Galiban Cr memo)
330911	30	\$29,992		Low	
N = 6		\$205,718			\$0
330530	134	\$133,624		Medium	
330540	143	\$142,682		Medium	
330550	243	\$243,001		Medium	
331011	178	\$177,582		Medium	
331012	0	\$0		Medium	
331017	110	\$109,504		Medium	
331023	110	\$109,919		Medium	
331025	15	\$15,072		Medium	
331026	94	\$93,814		Medium	
331031	483	\$483,322		Medium	Yes Do not exclude - see App D (Arryo Grande Cr memo)
330970	1,621	\$1,621,399		Medium	Yes Do not exclude - see App D (Galiban Cr. Memo)
N = 11		\$3,129,920			\$0
330510	46	\$46,412		High	
330520	129	\$128,864		High	
330700	627	\$627,065		High	
330800	1,394	\$1,393,869		High	
330960	1,318	\$1,317,985		High	
330981	2,332	\$2,331,971		High	
331013	1	\$1,388		High	
331014	17	\$16,576		High	
331018	17	\$17,218		High	
331021	130	\$129,560		High	

331022  
331024  
331027

156  
419  
163

\$156,393  
\$418,604  
\$162,750

High  
High  
High

N = 10

\$6,748,655

Total ESU Cost  
Total Exclusions  
Designation Cost

\$10,084,293  
\$0  
\$10,084,293

0.00%  
100.00%

**Table B5. Conservation Ratings, Economic Impacts, and Potential Exclusions for SC O. mykiss ESU**

CalWater Unit	Impact Score	Annual Cost (\$/yr)	Cons. Value	Exceeds Threshold?	CHART Recommendations and Exclusion Benefit
331210	412	\$412,423		Low	Yes Ok to exclude tribs/retain mig coor - \$56,000 (1)
331230	4,685	\$4,684,515		Low	Yes Ok to exclude - \$4,684,515
331430	89	\$88,854		Low	Yes Ok to exclude tribs/retain mig coor - \$33,000 see (2)
440811	860	\$860,033		Low	Yes Ok to exclude - \$860,033
440813	0	\$0		Low	Yes Ok to exclude - \$860,033
490121	269	\$269,446		Low	Yes Do not exclude - see footnote (3)
<b>N = 6</b>					
<b>\$6,315,271</b>					
331440	265	\$265,290		Medium	
331451	2,659	\$2,658,812		Medium	Yes Ok to exclude - \$2,658,812 - see justification memo
440231	2	\$2,070		Medium	
440232	152	\$151,743		Medium	
440310	135	\$134,747		Medium	
490124	11	\$10,603		Medium	
<b>N = 6</b>					
<b>\$6,223,265</b>					
331220	2,628	\$2,627,525		High	
331410	20	\$19,524		High	
331420	110	\$109,994		High	
331510	1,297	\$1,296,548		High	
331531	390	\$390,263		High	
331532	982	\$982,211		High	
331533	193	\$192,759		High	
331534	306	\$306,166		High	
440210	16	\$15,973		High	
440220	1,866	\$1,865,898		High	
440321	246	\$246,180		High	
440322	56	\$56,090		High	
440331	45	\$44,725		High	
440332	1,867	\$1,866,599		High	

440341	192	\$192,030	High
440411	12	\$11,522	High
440421	27	\$26,840	High
440444	0	\$0	High
490122	112	\$112,387	High
490123	21	\$20,704	High
490125	427	\$426,927	High
490126	133	\$132,692	High
490127	0	\$0	High
490128	36	\$35,880	High
490140	491	\$490,773	High

N = 25 \$11,470,210

Total ESU Cost	\$21,008,746
Total Exclusions	\$8,292,360
Designation Cost	\$12,716,386
	39.00%
	61.00%

- (1) 331210 - migratory corridor retention and exclusion of tribes. Cost benefit using Plummer method is \$56,000
- (2) 331430 - migratory corridor retention and exclusion of tribes. Cost benefit using Plummer method is \$33,000
- (3) 490121 - only very small portion of Trabuco Cr in this unit (approx 0.3 miles), but is the migratory corridor for upstream spawning/rearing. Costs for this Calwater unit not likely to be associated with this small stream segment, so costs are overstated. Retain in CHD thus no benefit of exclusion.

**Table B6. Conservation Ratings, Economic Impacts, and Potential Exclusions for CV Spring-Run Chinook E**

CalWater Unit	Impact Score	Annual Cost (\$/yr)	Cons. Value	Exceeds Threshold?	CHART Recommendations and Exclusion Benefit
550711	19	\$18,931		Low	
550722	41	\$41,405		Low	
550731	3	\$3,214		Low	Ok to exclude - see justification - \$3,214
552310	1,030	\$1,030,044		Low	Yes Ok to exclude - see justification - \$1,030,044
552433	726	\$726,428		Low	Yes Ok to exclude - see justification - \$726,428
554400	2,632	\$2,631,672		Low	Yes Ok to exclude - see justification - \$2,631,672
220410	618	\$617,688		Low	Yes Ok to exclude - see justification - \$617,688
551713	533	\$533,156		Low	Yes Ok to exclude - see justification - \$533,156
<b>N = 8</b>		<b>\$5,602,539</b>			<b>\$5,542,202</b>
550410	85	\$84,684		Medium	
551720	244	\$244,188		Medium	
551921	717	\$717,413		Medium	Yes Ok to exclude - see justification - \$717,413
554300	509	\$509,039		Medium	Yes Ok to exclude - see justification - \$509,039
<b>N = 4</b>		<b>\$1,555,324</b>			<b>\$1,226,452</b>
550420	367	\$367,493		High	
550712	1,031	\$1,031,279		High	
550810	741	\$740,752		High	
550820	37	\$37,339		High	
550914	38	\$37,984		High	
550920	615	\$614,961		High	
550942	423	\$422,799		High	
550963	262	\$261,858		High	
551000	1,151	\$1,150,986		High	
551530	40	\$39,606		High	
551540	5,386	\$5,385,817		High	
551712	16	\$15,588		High	
551922	513	\$512,905		High	
552010	161	\$161,492		High	
552021	1	\$919		High	
552030	107	\$107,035		High	
					<b>Recommend exclusion of DWSC - see (1) - \$21,000</b>

552040	507	\$506,580	High
552130	862	\$862,499	High
552436	660	\$660,373	High
552440	32	\$31,705	High
552462	20	\$19,776	High
220312	508	\$507,863	High
220610	122	\$122,266	High
220710	388	\$388,483	High
551714	2,431	\$2,431,170	High
<b>N = 25</b>		<b>\$16,419,528</b>	<b>\$21,000</b>

Total ESU Cost	\$23,577,391
Total Exclusions	\$6,789,654
Designation Cost	\$16,787,737
	29.00%
	71.00%

(1) 551000 - this unit contains the Deep Water Ship Channel which CHART recommends be excluded from the CHD even though this is a high conservation value unit. E-mail from IEC indicates only \$21,000 can be attributed as benefit of DWSC exclusion.

**Table B7. Conservation Ratings, Economic Impacts, and Potential Exclusions for CV O. mykiss ESU**

CalWater Unit	Impact Score	Annual Cost (\$/yr)	Cons. Value	Exceeds Threshold?	CHART Recommendation and Exclusion Benefit
550711	19	\$18,931	Low		
550721	0	\$0	Low		
550962	0	\$41	Low		
551510	65	\$64,808	Low	No	Ok to exclude (9/15) - \$64,808
551720	244	\$244,188	Low	Yes	Ok to exclude (9/28) - \$244,188
552110	1	\$1,344	Low	No	Ok to exclude (9/15) - \$1,344
552120	7	\$7,256	Low		
553111	406	\$406,192	Low	Yes	Ok to exclude (7/15) - \$406,192
553240	190	\$189,739	Low	Yes	Ok to exclude (7/15) - \$189,739
220410	618	\$617,688	Low	Yes	Ok to exclude (9/28) - \$617,688
551713	533	\$533,156	Low	Yes	Ok to exclude (7/15) - \$533,156
553221	344	\$343,785	Low	Yes	Ok to exclude (9/28) - \$343,785
553223	1,113	\$1,112,980	Low	Yes	Ok to exclude (9/28) - \$1,112,980
553224	804	\$804,164	Low	Yes	Ok to exclude (9/28) - \$804,164
N = 14					\$4,318,044
N = 14					\$4,344,274
550410	85	\$84,684	Medium		
550722	41	\$41,405	Medium		
550731	3	\$3,214	Medium		
550964	41	\$40,983	Medium		
551110	145	\$144,560	Medium	No	Ok to exclude - \$144,560
551120	0	\$0	Medium		
552433	726	\$726,428	Medium	Yes	Do not exclude - see App D (7/15/04 memo)
552435	144	\$143,996	Medium		
552436	660	\$660,373	Medium	Yes	Do not exclude - see App D (7/15/04 memo)
553120	247	\$247,008	Medium	No	Partial benefits - see (1) - no benefit of exclusion
553570	48	\$48,336	Medium		
553580	150	\$149,643	Medium	Yes	Do not exclude - see footnote (3)
553590	346	\$346,093	Medium		
554120	80	\$80,420	Medium	Yes	Ok to exclude - \$509,039
554300	509	\$509,039	Medium	Yes	Do not exclude - see footnote (4)
551422	609	\$609,083	Medium		
N = 10					\$9,835,264
N = 10					\$653,599



Total ESU Cost	\$29,187,888	
Total Exclusions	\$4,992,643	17.00%
Designation Cost	\$24,195,245	83.00%

- (1) 553120 - Customized/partial exclusion for this unit. Retain Mokelumne River, but exclude Mosher Creek. It is not possible to attribute benefits of exclusion to Mosher Creek, therefore, there is no benefit of exclusion associated with this unit.
- (2) 551000 - CHART recommends exclusion of the Deep Water Ship Channel from this unit that has high conservation value. IEC memo of 9/22 indicates that benefit of exclusion attributable to DWSC are \$21,000
- (3) 553590 - CHART recommends retention of this watershed (see e-mail dated 9/28/04). This upper reach of the Merced River contains the only suitable steelhead spawning habitat in the watershed and also has excellent rearing habitat. There are uncertainties about the number of steelhead using this river, but portion support O. mykiss. Many efforts also underway to restore damage from historic gravel mining areas and passage above Crocker Huffman Dam is being investigated.
- (4) 551422 - CHART recommends retention of this watershed per e-mail and discussions dated 7/30/04. This watershed contains habitat which the team believes is essential to conservation for steelhead.

Appendix C Maps C1-C7: Maps Illustrating Proposed HSA Watershed Economic Exclusions for 7 ESUs of Salmon and O. mykiss in California.

Map C1 - California Coastal chinook ESU

Map C2 - Northern California O. mykiss ESU

Map C3 - Central California Coast O. mykiss ESU

Map C4 - South-Central California Coast O. mykiss ESU

Map C5 - Southern California O. mykiss ESU

Map C6 - Central Valley spring-run chinook ESU

Map C7 - Central Valley O. mykiss ESU

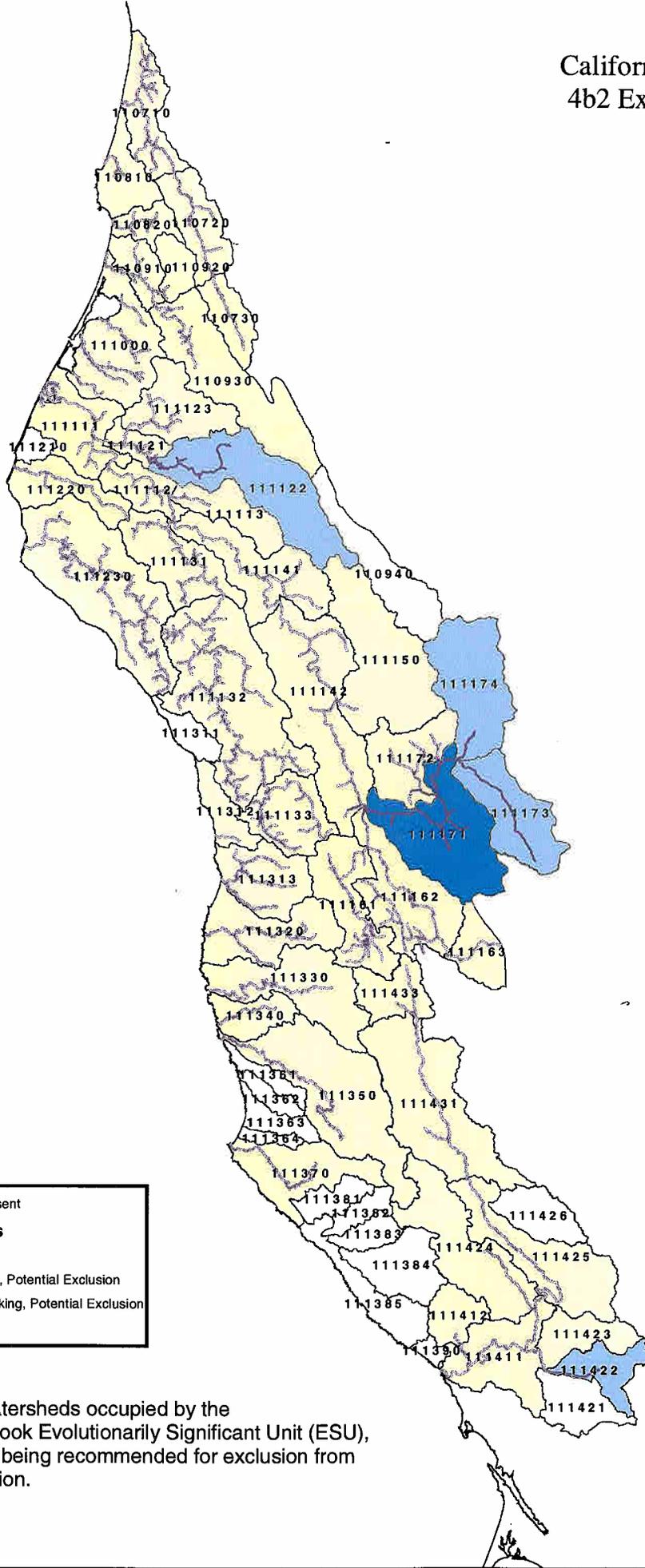
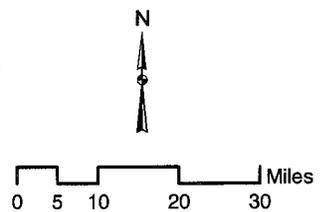
Draft  
California Coastal Chinook  
4b2 Excluded Watersheds

Streams with Chinook Present

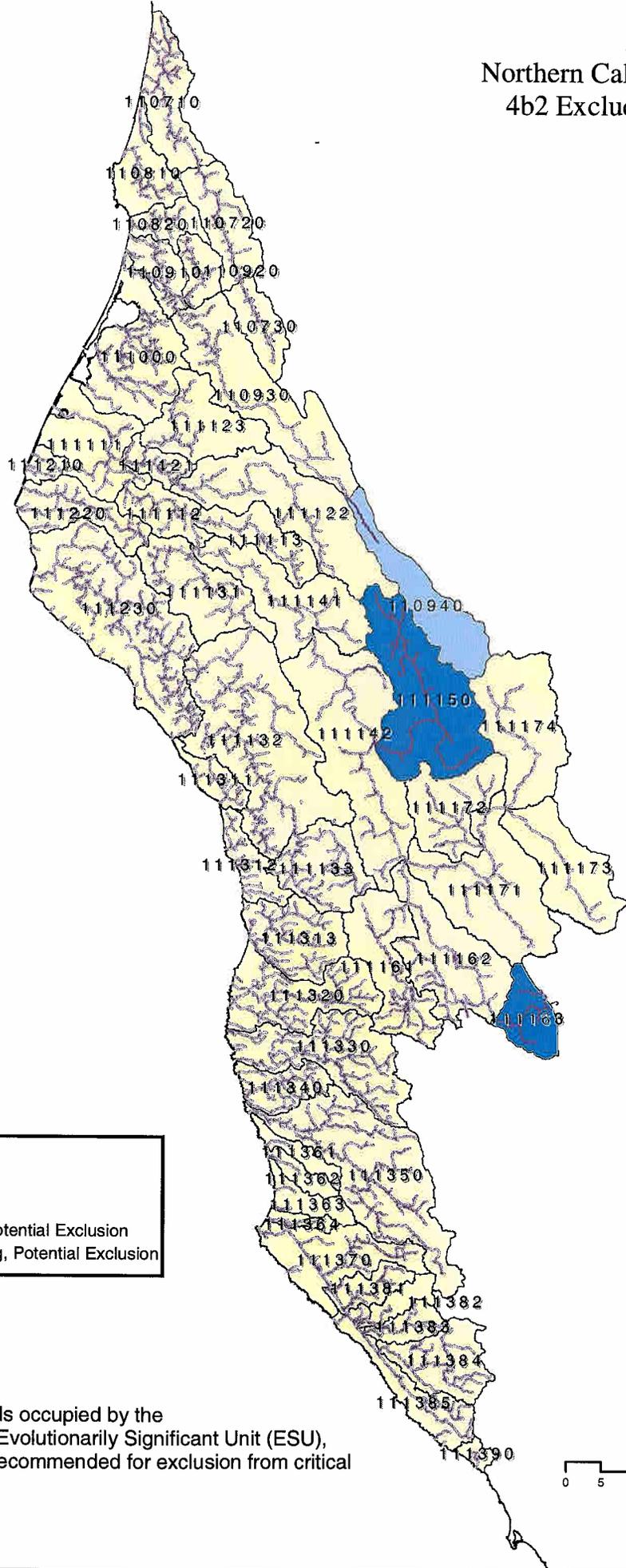
**5th Field Calwater Units**

- Areas Not Excluded
- Low Conservation Ranking, Potential Exclusion
- Medium Conservation Ranking, Potential Exclusion
- Areas Not Ranked

Map of the fifth-field watersheds occupied by the California Coastal Chinook Evolutionarily Significant Unit (ESU), illustrating those areas being recommended for exclusion from critical habitat designation.

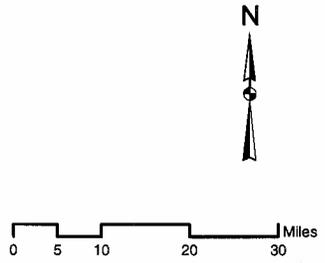


Draft  
Northern California *O. mykiss*  
4b2 Excluded Watersheds



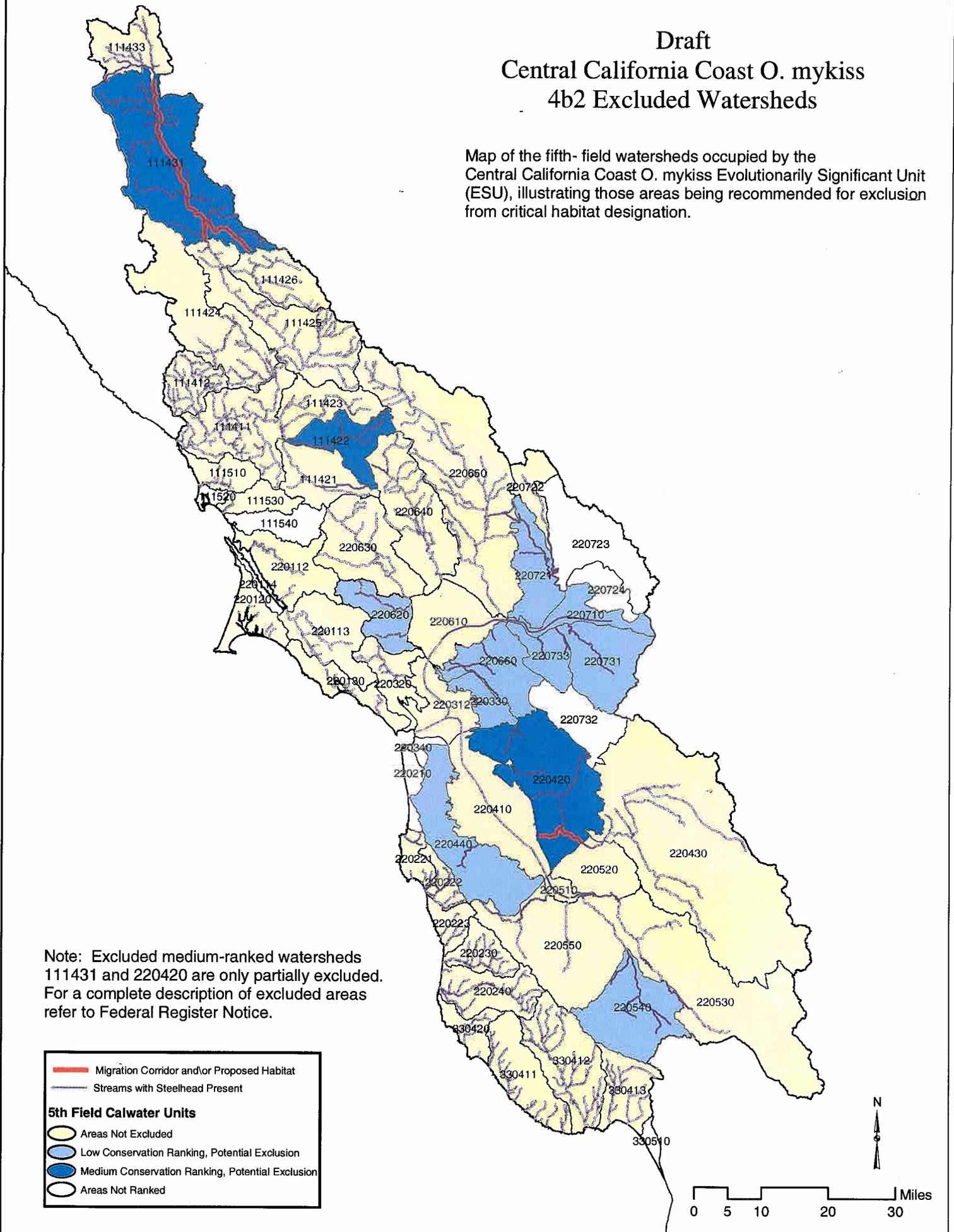
~ Streams with Steelhead Present  
**5th Field Calwater Units**  
○ Areas Not Excluded  
○ Low Conservation Ranking, Potential Exclusion  
● Medium Conservation Ranking, Potential Exclusion

Map of the fifth-field watersheds occupied by the Northern California *O. mykiss* Evolutionarily Significant Unit (ESU), illustrating those areas being recommended for exclusion from critical habitat designation.

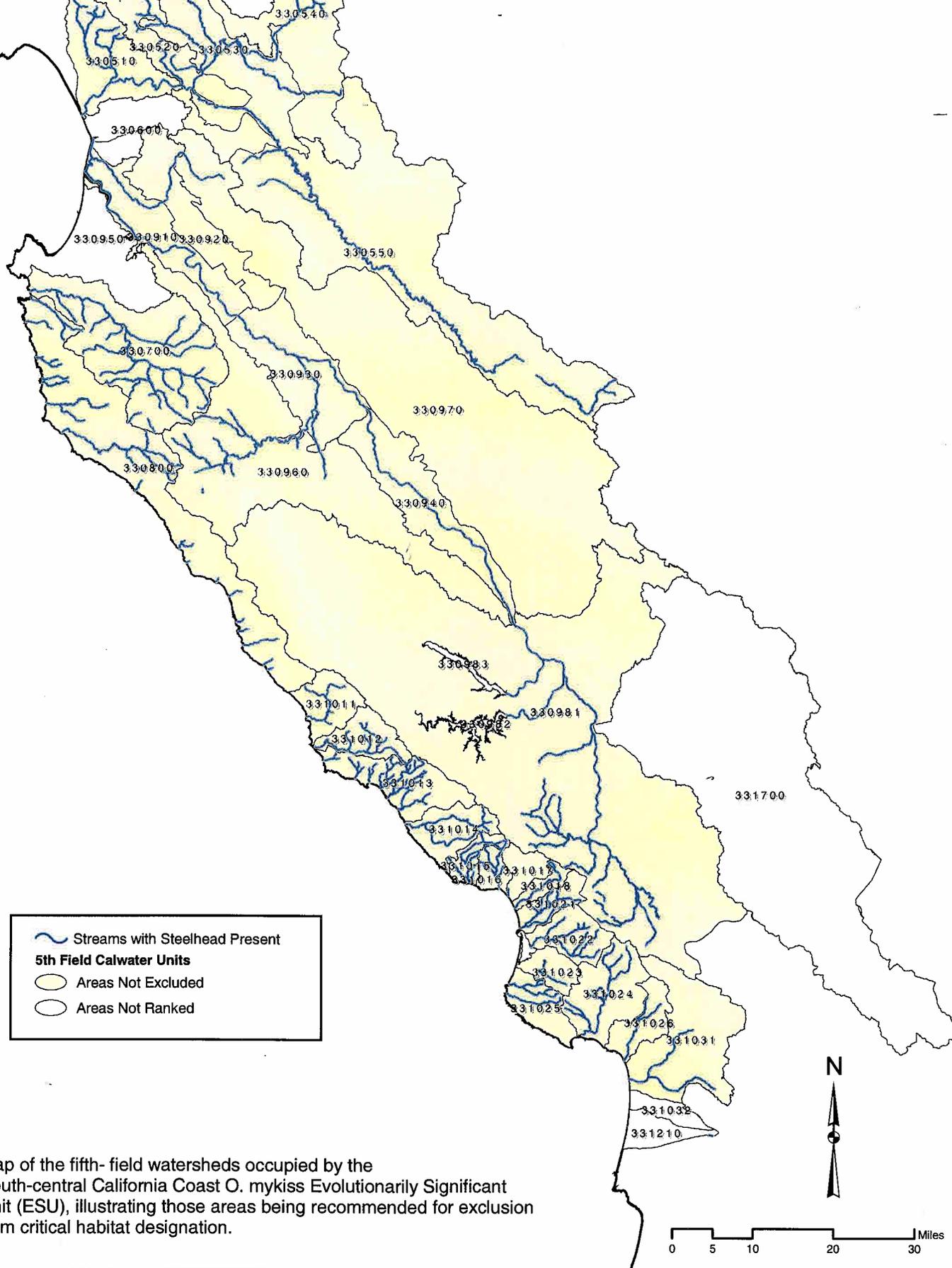


# Draft Central California Coast *O. mykiss* 4b2 Excluded Watersheds

Map of the fifth- field watersheds occupied by the Central California Coast *O. mykiss* Evolutionarily Significant Unit (ESU), illustrating those areas being recommended for exclusion from critical habitat designation.

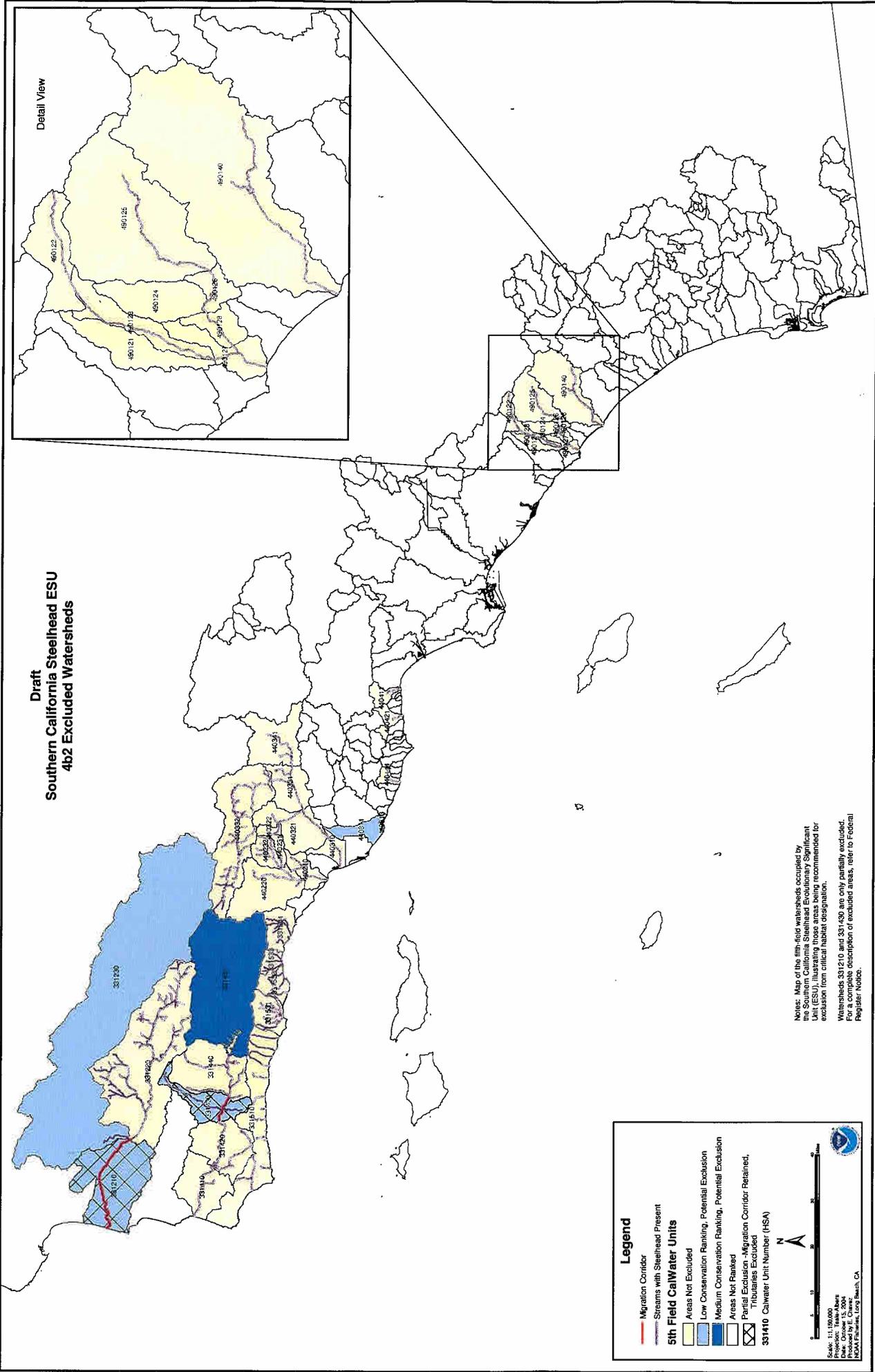


Draft  
South - central California Coast *O. mykiss*  
4b2 Excluded Watersheds



Map of the fifth-field watersheds occupied by the South-central California Coast *O. mykiss* Evolutionarily Significant Unit (ESU), illustrating those areas being recommended for exclusion from critical habitat designation.

**Draft**  
**Southern California Steelhead ESU**  
**4b2 Excluded Watersheds**



Notes: Map of the fifth-field watersheds occupied by the Southern California Steelhead Evolutionary Significant Unit (ESU), illustrating those areas being recommended for exclusion from critical habitat designation. Watersheds 331210 and 331430 are only partially excluded. For a complete description of excluded areas, refer to Federal Register Notice.

**Legend**

- Migration Corridor
- Streams with Steelhead Present
- 5th Field Calwater Units**
  - Areas Not Excluded
  - Low Conservation Ranking, Potential Exclusion
  - Medium Conservation Ranking, Potential Exclusion
  - Areas Not Ranked
  - Partial Exclusion - Migration Corridor Retained, Tributaries Excluded
  - 331410 Calwater Unit Number (HSA)

Scale: 1:1,500,000  
 Date: October 19, 2009  
 Produced by: E. Chavez  
 Rockwell Analytics, Long Beach, CA

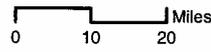
# Draft California Central Valley Spring-Run Chinook

## 4b2 Excluded Watersheds



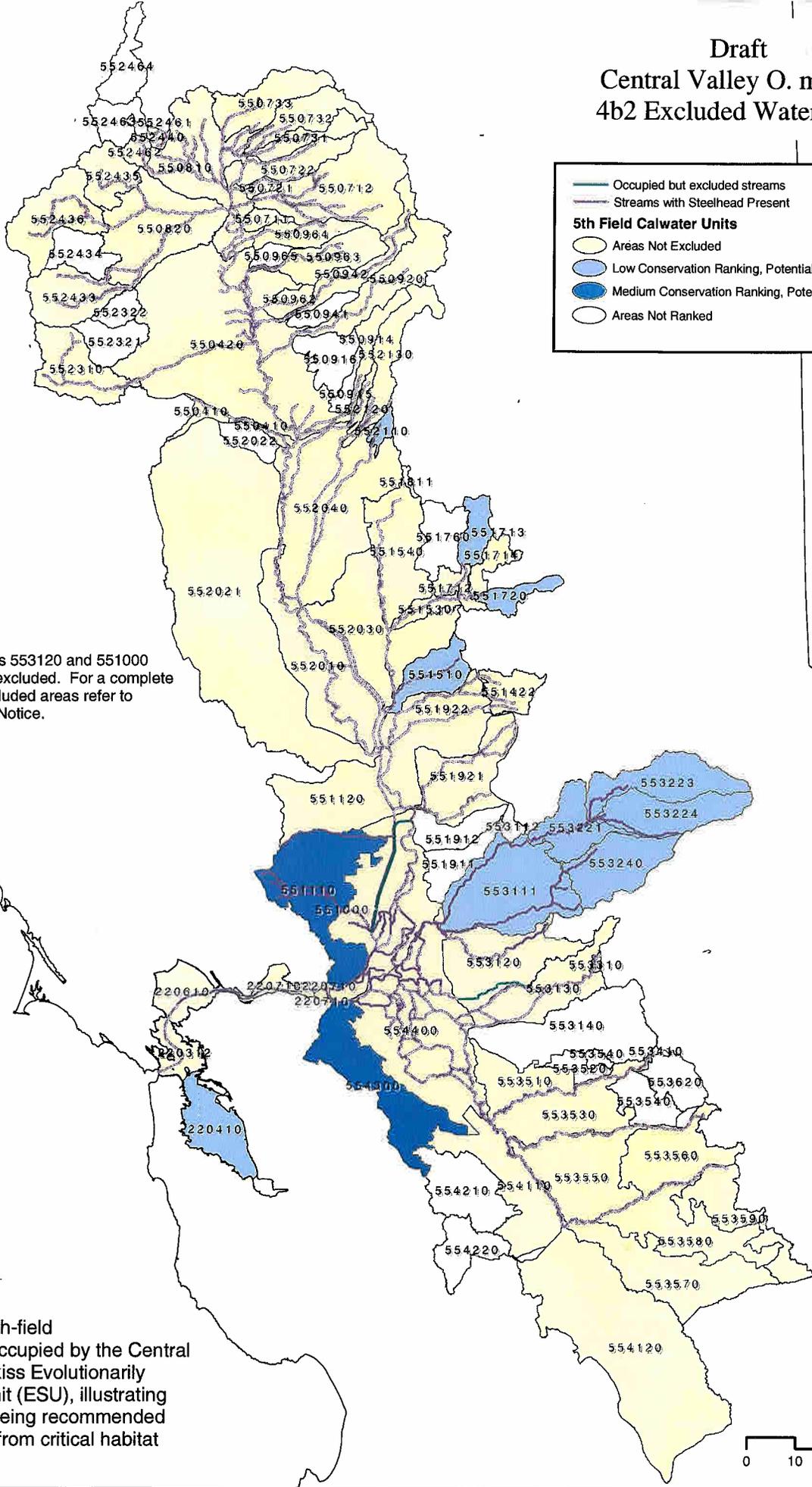
Streams with Chinook Present  
 Occupied but excluded streams  
**5th Field Calwater Units**  
 Areas Not Excluded  
 Low Conservation Ranking, Potential Exclusion  
 Moderate Conservation Ranking, Potential Exclusion  
 Areas Not Ranked

Note: Watershed 551000 is only partially excluded. For a complete description of excluded areas refer to Federal Register Notice.



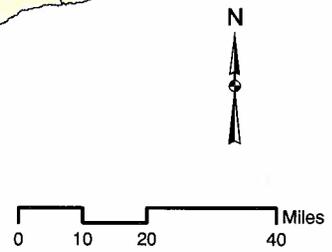
Map of the fifth-field watersheds occupied by the California Central Valley Spring-Run Chinook Evolutionarily Significant Unit (ESU), illustrating those areas being recommended for exclusion from critical habitat designation.

# Draft Central Valley O. mykiss 4b2 Excluded Watersheds



Note: Watersheds 553120 and 551000 are only partially excluded. For a complete description of excluded areas refer to Federal Register Notice.

Map of the fifth-field watersheds occupied by the Central Valley O. mykiss Evolutionarily Significant Unit (ESU), illustrating those areas being recommended for exclusion from critical habitat designation.



Appendix D. Memoranda Supporting Retention of HSAs that Exceed Economic Cost Thresholds (for Low and Medium HSAs) in Critical Habitat Designation Proposal

Northern California O. mykiss ESU:

- Memo dated 8/4/04 regarding Van Duzen River HSA (111122)

Central California Coast O. mykiss ESU:

- Memo dated 7/28/04 regarding Ukiah HSA (111431)
- Memo dated 7/28/04 regarding Coyote Creek USA (220530)

South-Central California O. mykiss ESU:

- Memo dated 7/27/04 regarding Galiban Creek HSAs (330970 and 330920)
- Memo dated 9/13/04 regarding Arroyo Grande Creek HSA (331031)

Central Valley spring run chinook ESU:

- Memo dated 7/15/04 regarding Upper Cottonwood Cr and Beegum/Cottonwood Creek HSAs (552433 and 552436)

# Memorandum

**To:** Craig Wingert

**From:** Brad Wiley (w/ input from Greg Bryant)

**Date:** 08/04/04

**Re:** Justification for not excluding the Upper VanDuzen River (CalWater 111122) from NC Steelhead Critical Habitat Designation

---

The Upper VanDuzen River (CalWater 111122) was identified as a potential area of exclusion from critical habitat designations for NC steelhead, based upon the results of preliminary economic impact analysis. This memorandum presents a justification for inclusion of this watershed for NC steelhead critical habitat designation, irrespective of the level of draft economic impacts identified.

The VanDuzen River is famous for steelhead fishing and historically contained a large population of this species- presumably because it offers a suite of physical conditions favorable to steelhead life-histories. The VanDuzen is the largest Eel River tributary outside of the forks and has better potential as a "refugia" watershed than do the watersheds of the upper Eel River because of its proximity to the coastal fog belt, which helps keep water temperatures low and surface waters flowing- even in drought years. As such, the VanDuzen represents the best potential for the production of an anchor/seed population of NC steelhead that will be necessary for the eventual recovery of steelhead populations throughout the Eel River system. Because the Eel River basin represents such a large chunk of the total land area of NC steelhead, recovery of this ESU without recovery of the Eel River populations seems unlikely at best.

The presence of both the summer steelhead and half-pounder life-history strategies in the VanDuzen River are a testament to the current and future value of this watershed for NC steelhead production. Summer steelhead require deep pools of cool water to successfully survive the summer in fresh water. The VanDuzen River, along with the Middle Fork Eel River, contain the southernmost known populations of this steelhead life-history variant. We believe that the uniqueness and importance of this intra-species diversity alone justifies the additional protections afforded by critical habitat designation.

Between these two watersheds, the VanDuzen River tends to be cooler and less prone to drought than does the Middle Fork Eel River, and therefore could function as the last bastion for these fish in the Eel River during times of extreme climatic fluctuations. Recovery of NC steelhead populations in the VanDuzen in the near future will become increasingly important if the predicted acceleration of global warming over the next century proceeds as currently predicted. Therefore precautionary approach would dictate that the entire extent of anadromy in the VanDuzen watershed be designated as critical habitat for NC steelhead, considering the importance of this watershed to recovery of steelhead in the Eel River basin, and the importance of recovering steelhead in the Eel River to recovery of the ESU as a whole.

As a final matter, we note that the current version of the draft economic impact analysis estimates an impact of approximately \$468k, which although close, does not surpass the \$500k bar for exclusion of a HUC with a medium conservation value. Furthermore, we also note that nearly \$442K of the total \$468k of estimated impact occurs on federal lands. Although we find these figures puzzling, we do not currently have a detailed copy of the economic analysis for the VanDuzen, and so cannot assess the validity of these estimates. However,

*August 4, 2004*

given that federal lands make up such a small portion of total land ownership in the VanDuzen watershed (Greg Bryant estimates less than 2%), basing exclusion on economic impacts attributed to such a small land base seems inappropriate- especially give the unique value of this watershed outlined above.



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
777 Sonoma Avenue, Room 325  
Santa Rosa, California 95404

July 28, 2004 F/SWR3: DH

MEMORANDUM FOR: The Administrative Record for the Re-designation of Critical Habitat for the Central California Coast steelhead ESU

FROM: David Hines, Fishery Biologist

SUBJECT: Designation of Pieta Creek as Critical Habitat for the Central California Coast steelhead ESU.

The Pieta Creek watershed is one of several tributaries to the Russian River contained in the Ukiah Hydrologic Sub Area (HSA) (Calwater unit # 111431). This HSA was ranked as medium conservation value to Central California Coast steelhead as part of the critical habitat redesignation process. It is also proposed to be excluded from critical habitat designation due to overriding economic considerations (section 4b2 of the ESA).

From a conservation viewpoint, the exclusion of the majority of the Ukiah HSA will likely not have a significant effect on the ESU for several reasons. First, the mainstem habitat, which is an important migration corridor for high value areas upstream, will be included as critical habitat based on the "connectivity rule." Secondly, most tributaries in this HSA provide little viable habitat for steelhead. This is due to lack of surface flow and warm water temperatures in the summer. The typical tributary descends from high gradient reaches inaccessible to steelhead into a short reach where spawning and rearing can occur. These creeks then cross the Russian River floodplain where flow goes subsurface. This prohibits rearing and impairs outmigration. The potential for steelhead production in the HSA is therefore somewhat limited (Daugherty 2000).

Pieta Creek is the second largest tributary in the HSA, behind Feliz Creek, and drains approximately 37.4 square miles. Most of the stream is characterized by steep, rugged slopes interspersed with a few small, narrow valleys. The vegetation is dominated primarily by chaparral, oak, madrone and grasslands. Compared to other streams in the ESU, Pieta Creek has suffered little alteration, due primarily to its remote location. Land uses include grazing, agriculture, roads, and water diversions. Sedimentation, reduced riparian cover, and elevated water temperatures are components of degraded habitat present in the watershed. Pieta Creek is part of the Geysers Known Geothermal Resources Area, but no wells or power plants are present (CDFG 2001).

Pieta Creek is distinct from other tributaries in the HSA in that it possesses good year-round surface flow and supports nearly 20 miles of occupied steelhead habitat. The stream enters the Russian River in a confined reach and therefore does not cross the floodplain or have the rearing and outmigration issues of the other tributaries. In fact, Pieta Creek is



geomorphically similar to tributaries to the south, which are in HSAs ranked as high conservation value for CCC steelhead. A survey conducted by CDFG in 1974 (the most recent conducted for Pieta Creek) found abundant juvenile steelhead throughout the occupied areas (CDFG 2001).

Based on this evidence, it seems counterproductive to the purposes of designating critical habitat to exclude Pieta Creek largely because it is related to less valuable habitat by the artificial construct of HSAs. Its physical features, and value to the species seem more affiliated with the high value conservation tributaries to the south. For these reasons, Pieta Creek should be designated as an area of critical habitat, while the rest of the HSA should be excluded.

### **Literature Cited**

California Department of Fish and Game (CDFG). 2001. Draft Russian River Basin Fisheries Restoration Plan. California Department of Fish and Game, Central Coast Region. Hopland, California.

Daugherty, T. 2004. NOAA Fisheries, Southwest Region, Ukiah Field Office. Personal communication.



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
777 Sonoma Avenue, Room 325  
Santa Rosa, California 95404

July 28, 2004 F/SWR3: MEM

**MEMORANDUM FOR:** The Administrative Record for the Re-designation of Critical Habitat for the Central California Coast steelhead ESU

**FROM:** Maura Eagan Moody, Fishery Biologist

**SUBJECT:** Biological justification for overriding the proposed economic exclusion of the lower Coyote Creek watershed as Critical Habitat for the Central California Coast steelhead ESU.

Only four southern San Francisco Bay tributaries in Santa Clara County currently support viable steelhead runs: the Guadalupe River, Stevens Creek, San Francisquito Creek, and Coyote Creek (Smith 1998). The Guadalupe River, Stevens Creek, and San Francisquito Creek each offer approximately 3 to 6 miles of habitat suitable for spawning and rearing. Coyote Creek offers approximately 7 miles of suitable habitat, making it a significant contributor to available habitat for steelhead. These four streams are geographically isolated from other steelhead populations in the northern Bay.

The Coyote Creek watershed is the largest in northern Santa Clara County and drains an area of approximately 82,880 hectares (320 square miles) (Santa Clara Basin Watershed Management Initiative 2000). Coyote Dam and Anderson Dam, constructed in 1936 and 1950, respectively, block access to approximately 51,821 hectares (200 square miles) of the upper Coyote Creek watershed, reducing the amount of available habitat that was historically available by approximately 56% (Leidy et al. 2003). Upper Penitencia Creek is the largest tributary to Coyote Creek, draining an area of approximately 6,216 hectares (24 square miles). Upper Penitencia is thought to be the chief producer of steelhead within the watershed (Li 2001). Habitat typing data developed by the Fisheries and Aquatic Habitat Collaborative Effort included analysis of fish passage conditions, water quality, substrate and other habitat features required for spawning and rearing in Coyote Creek and Upper Penitencia Creek (Entrix 2000, Fisheries and Aquatic Habitat Collaborative Effort 2000, Li 2001). These data suggest that, while the watershed may be degraded, compared to more urbanized watersheds in the Santa Clara Basin, Coyote Creek and Upper Penitencia Creek are less constrained by adjacent land uses, and continue to provide essential habitat features for steelhead migration, spawning, rearing, and migration.

The lower reaches of Coyote Creek flow thorough an intensely urbanized environment and include on-stream groundwater recharge percolation ponds, and areas of degraded riparian habitat. They do, however, provide access as far as the downstream dam, Anderson Dam, and based on the "connectivity rule," should also be designated as critical habitat. Significant portions of the watershed from Anderson Dam downstream for approximately nine miles



are buffered from the worst effects of urbanization by public land managers and less intensive land uses. The Santa Clara Department of Parks and Recreation and City of San Jose manage public lands along the Coyote Parks Greenway and in Alum Rock Park in the Upper Penitencia Creek drainage. These open spaces are managed primarily to protect water quality and provide recreation, and other uses that are not incompatible with steelhead conservation. They offer valuable opportunities for restoration and enhancement of habitat.

Efforts to assign a conservation value to the watershed resulted in a score that was just below the threshold for a high value (12 of 13 points). The score was somewhat skewed by the presence of two large dams that prevent anadromy. Outflows from the lower Anderson dam, however, provide good cold water habitat for spawning and rearing for approximately four miles below the dam. Additional restoration efforts are underway in the watershed, including the Fisheries and Habitat Collaborative Effort (2000) and the Alum Rock Park Riparian Management Plan (Biotic Resources Group 2001). The Fisheries and Habitat Collaborative Effort will make changes in the management of releases from the dam to improve water quality for fish, and the Management Plan identifies and prioritizes actions that will preserve, restore and enhance the health of the riparian and aquatic habitat in Upper Penitencia Creek.

The Coyote Creek watershed has the potential to contribute significantly to the conservation of the CCC steelhead ESU by providing a source population to re-establish an extirpated run when passage is restored in nearby Alameda Creek. The Coyote Creek watershed is geographically isolated from other viable populations in the San Francisco Estuary. While small numbers of steelhead are present in a few South Bay streams, viable populations are present in North Bay tributaries, over forty miles away.

The probability of a deme (a population of salmonids typically considered at the watershed scale), persisting over time is largely controlled by the population size, the rate of reproduction, and the rate of recruitment from other demes (the rate at which adults stray from their natal streams) (Cooper and Mangel 1999, McElhane et al. 2000). Recruitment rates are variable depending on species and location (Cooper and Mangel 1999), but modest changes in stray rates can reduce survival rates dramatically in salmon stocks; particularly those with low abundance and modest growth rates (Routledge and Irvine 1999). Stray rates are, in turn, greatly influenced by the distance from one stream to the next. Stream mouths greater than 20 miles apart have substantially less straying between them than do streams closer together. It is therefore important to maintain robust populations, positive growth rates and successful dispersion between demes at the ESU scale to avoid extirpation, reduced viability of the population, and ultimately extinction.

The southern portion of San Francisco Bay provides a good example of a population facing a high risk of extirpation due to a failure to meet the conditions described above. All streams draining into this area are heavily impacted by urbanization and support relatively small populations of steelhead. Many of the smaller streams do not support salmonids at all. The four streams that are occupied, barely provide the continuity/proximity to ensure the dispersion and recolonization function among south bay streams.

The economic costs attributed to the Coyote Creek Calwater Unit appear excessive and are not

likely to represent actual costs. Specifically, as far as we know, mining is no longer occurring in the watershed. Dredging occurs as sediment removal to maintain flood conveyance in the lower watershed, and these activities have already been addressed in a biological opinion regarding a 10-year U.S. Army Corps of engineers permit for the Santa Clara Valley Water District Stream Maintenance Program. Consultation costs attributed to non-hydro dams are unrealistic, as we are unaware of a federal nexus for such consultations. Finally, the only Federal lands we are aware of in the watershed are former salt ponds that are now part of the San Francisco Bay Wildlife Refuge. Their impact on management of the watershed for steelhead is negligible.

Given the amount of suitable spawning and rearing habitat, the relatively high conservation value score assigned, the historical utilization of the watershed, and the active restoration efforts already underway, Coyote Creek has the potential to contribute significantly to the conservation of CCC steelhead. Its unique geographic location and relative isolation from other steelhead populations in San Francisco Bay increase the conservation value of this watershed. This area is already at high risk of extirpation because of its low abundance, low production, and high degree of isolation. We recommend that the portion of the Calwater Unit (#220530) containing the mainstem of Coyote Creek below Anderson Dam, and its tributary, Upper Penitencia Creek, be designated as critical habitat for the CCC steelhead ESU.

### Literature Cited

- Biotic Resources Group. 2001. Alum Rock Park Riparian Management Plan. Prepared for the City of San Jose. 116 pages plus appendices.
- Cooper, A.B., M. Mangel. 1999. The dangers of ignoring metapopulation structure for the conservation of salmonids. *Fisheries Bulletin* 97:213-226.
- Entrix, Inc. 2000. Stream Habitat Inventory Summary Report for the Fisheries and Aquatic Habitat Collaborative Effort.
- Fisheries and Aquatic Habitat Collaborative Effort Technical Advisory Committee (FAHCE TAC). 2000. Summary and conclusion. FAHCE TAC evaluation of the effects of Santa Clara Valley Water District facilities and operations on factors limiting habitat availability and quality for steelhead and Chinook salmon. Draft. San Jose, California.
- Leidy, R.A., G.S. Becker, and B.N. Harvey. 2003. Historical Distribution and Current Status of Steelhead (*Oncorhynchus mykiss*), Coho Salmon (*O. Kisutch*), and Chinook Salmon (*O. Tshawytscha*) in Streams of the San Francisco Estuary, California. U.S. Environmental Protection Agency, San Francisco, and Center for Ecosystem Management and Restoration, Oakland, California.
- Li, S. 2001. Draft Electrofishing Surveys on Guadalupe Creek, Stevens, Coyote and Penitentia Creeks: Catch Results. Aquatic Systems Research. Loomis, California.
- McElhaney, P., M. Ruckelshaus, M.J. Ford, T. Wainwright, and E. Bjorkstedt. 2000. Viable

salmonid populations and the recovery of evolutionarily significant units, appendix A4: population size. Draft NOAA Fisheries Technical Memorandum NMFS-NWFSC-42, Seattle, Washington.

Routledge, R.D., J.R. Irvine. 1999. Chance fluctuations and the survival of small salmon stocks. *Canadian Journal of Fisheries and Aquatic Sciences*, 56: 1512-1519.

Santa Clara Basin Watershed Management Initiative. 2000. Watershed Management Plan, Volume 1: Watershed Characteristics Report. Santa Clara, California.

Smith, J.J. 1998. Steelhead and other fish resources of western Mt. Hamilton streams. Unpublished report. San Jose State University, San Jose.



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
777 Sonoma Avenue, Room 325  
Santa Rosa, California 95404

July 27, 2004 F/SWR3:KAJ

MEMORANDUM FOR: The Administrative Record for the Re-designation of Critical Habitat for the South-Central California Coast steelhead ESU

FROM: Korie Johnson, Fishery Biologist

SUBJECT: Biological justification for overriding the proposed economic exclusion of Gabilan Creek as Critical Habitat for the South-Central California Coast steelhead ESU.

Hydrologic sub-areas (HSAs) 330970 and 330920 in the Salinas River Valley are proposed for exclusion from South-Central California Coast (SCCC) steelhead (*Oncorhynchus mykiss*) critical habitat designation due to high economic cost relative to the biological conservation value. These two HSAs are relatively large and predominantly unoccupied by SCCC steelhead. Excluding these HSAs from the critical habitat designation would not significantly affect conservation of SCCC steelhead, with the exception of upper Gabilan Creek.

Gabilan Creek is the only coastal basin supporting steelhead between Aptos Creek in northern Monterey Bay and the Carmel River, a distance of approximately 14 miles along the central California coast. Gabilan Creek is neighbored by the Salinas River that enters the ocean approximately three miles to the south and the Pajaro River that enters the ocean approximately three miles to the north. Although historically Gabilan Creek drained directly into the Salinas River, it now drains through Tembladero Slough into Old Salinas River Channel, which enters the ocean through Moss Landing Harbor. The Salinas River and Gabilan Creek are still connected through Old Salinas River Channel by a slide gate at the Salinas River lagoon. Both the Salinas and Pajaro Rivers have been described as ecologically different than the coastal basins, including Gabilan Creek, within the SCCC ESU (NOAA Fisheries 2003). As such, Gabilan Creek is ecologically isolated within the SCCC ESU.

Upper Gabilan Creek provides essential habitat features for steelhead spawning and rearing. It has perennial flow with abundant pools, riffles, overhead canopy, undercut banks and large woody debris (Hagar 2001, J. Casagrande, The Watershed Institute, California State University Monterey Bay, personal communication, July 26, 2004). Adults have been observed attempting to migrate upstream in Gabilan Creek in a number of recent years (T. Gaffney, NOAA Fisheries Office of Enforcement, personal communication, July 22, 2004). Three partial barriers are located within the middle reach of Gabilan Creek, which impact migration to the upper reaches. Efforts are currently underway to initiate projects to modify or remove these barriers and improve steelhead passage (T. Gaffney, NOAA Fisheries Office of Enforcement, personal communication, July 22, 2004). With modification of these barriers, productivity of Gabilan Creek is expected to increase substantially.



Gabilan Creek has the potential to contribute significantly to the conservation of SCCC steelhead both by production from Gabilan Creek itself and by providing a seed population for the larger Salinas River system. Although salmonids typically return to their natal streams, straying does occur. Given the proximity and connectivity to the Salinas River, Gabilan Creek fish could stray into the Salinas River. Neighboring streams are much more likely to receive strays than ones that are distant (Mangel 1996). According to Routledge and Irvine (1999) modest changes in stray rates can have dramatic effects on salmonid survival rates, particularly for populations with low abundance and modest growth rates.

Gabilan Creek also could provide an alternative for Salinas River steelhead unable to reach their natal spawning grounds. No spawning or rearing habitat is available in the mainstem of the Salinas River. Therefore, steelhead migrating upstream must travel at least 50 miles to spawning and rearing habitat in the Arroyo Seco River (a major tributary to the Salinas River) or over 90 miles to tributaries in the upper Salinas River. Winter flows increase and decrease rapidly in the Salinas River, often limiting steelhead migration opportunities. Steelhead that are unable to reach Salinas River spawning habitat due to the flashy nature of the system, might be able to migrate a much shorter distance to spawning habitat in upper Gabilan Creek.

In conclusion, upper Gabilan Creek in HSA 330970 should be designated as critical habitat because of the presence of high quality spawning and rearing habitat, its position and ecological isolation within the ESU, and its potential to provide a seed population for the Salinas River watershed. The middle and lower sections of Gabilan Creek in HSA 330970 and 330920 should be designated as critical habitat because they provide a crucial migration corridor to the upper watershed.

### **Literature Cited**

- Hagar, J. 2001. An Evaluation of Steelhead Habitat and Population in the Gabilan Creek Watershed. B.S. Thesis. California State University, Monterey Bay. 39 p.
- Mangel, M. 1996. Metapopulation ecology and the extinction risk of West Coast salmonid populations. *In: Assessing Extinction Risk for West Coast Salmon. Proceedings of the Workshop November 13-15, 1996.* Seattle Washington. NOAA Technical Memorandum NMFS-NWFSC-56.
- National Marine Fisheries Service (NOAA Fisheries). 2003. Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead. February 2003 co-manager review draft. United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. 455 p.
- Routledge, R.D. and J.R. Irvine. 1999. Chance fluctuations and the survival of small salmon stocks. *Canadian Journal of Fisheries and Aquatic Sciences* 56:1512-1519.



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Southwest Region  
501 West Ocean Boulevard, Suite 4200  
Long Beach, California 90802- 4213

MEMORANDUM

TO: Craig Wingert  
FROM: Anthony P. Spina  
DATE: Mon, Sep 13, 2004

SUBJECT: Critical Habitat and the Arroyo Grande Creek Hydrologic Sub-Area (331031)

You might recall that inclusion of the Arroyo Grande Creek, San Luis Obispo County, hydrologic sub-area (HSA) in the proposed critical habitat designation for the threatened South Central California Coast Evolutionarily Significant Unit (ESU) of steelhead trout (*Oncorhynchus mykiss*) was deemed inappropriate owing to the results obtained from the analyses performed as part of the economic assessment. Based on the experience and knowledge I have developed over the past six years (nearly seven) reviewing activities affecting steelhead in streams throughout San Luis Obispo County, performing qualitative and quantitative assessments of this species' habitat, examining factors affecting abundance and distribution of steelhead in selected streams, and performing research on the ecology of this species in South Central and Southern California, I believe precluding the Arroyo Grande Creek HSA from the critical habitat designation, based on the results of the economic assessment, would compromise conservation of the South Central California Coast ESU for the following reasons:

- Although the subject ESU is geographically broad, there are few representative streams in the southern portion of the ESU where steelhead actively spawn and rear. Arroyo Grande Creek is one of the few streams at the southern portion of the subject ESU where I have observed age-0 and older juvenile steelhead during summer and fall, and sexually ripe adults in winter and early spring.
- Because there are relatively few representative streams in the southern portion of the subject ESU, I believe that designating critical habitat in Arroyo Grande Creek would provide incentives and opportunities for maintaining and promoting improvement of existing biological and physical conditions conducive to recovery of this ESU. Steelhead in these "southern streams" may have genetic and life-history value for the broader subject ESU that exceeds current understanding.



- The relationship between steelhead survival and growth in the Arroyo Grande Creek HSA and other neighboring streams is unknown, to my knowledge. Therefore, not including the Arroyo Grande Creek HSA in the critical habitat designation would affect steelhead survival and growth in other local or regional streams in a manner that cannot be adequately predicted.
- There are numerous streams in San Luis Obispo County, but a disproportionate number in the southern portion of the subject ESU currently do not appear suitable for steelhead trout, owing in part to improper land-use activities. Arroyo Grande Creek is one of the notable exceptions.
- Lastly, San Luis Obispo County Flood Control and Water Conservation Zone 3 (District) operates Lopez Reservoir, which stores and diverts water for municipal and agricultural uses. Operation of the reservoir and maintenance at the dam affects the amount, extent and function of habitat for steelhead trout in the downstream tailwater, Arroyo Grande Creek. The District prepared a draft application for an Endangered Species Act (ESA) section 10(a)(1)(B) incidental take permit for operation and maintenance of the reservoir and submitted this application to NOAA Fisheries for review. Precluding the Arroyo Grande Creek HSA from the critical habitat designation could undermine NOAA Fisheries' ability to assist the District in developing an habitat conservation plan that would achieve the essential habitat functions required for long-term survival of steelhead trout within this important watershed.

In the light of the foregoing, I believe that Arroyo Grande Creek exhibits the habitat characteristics meeting the critical habitat definition in the ESA, and consequently, I recommend that the Arroyo Grande Creek HSA be included in the critical habitat designation for the threatened South Central California Coast ESU of steelhead trout, despite the findings obtained from the economic assessment.

**Critical Habitat Justifications for Flagged HSAs, Customized Exclusion Proposals, and a List of Potential Exclusions Based on Economical and/or Biological Evaluation**

Central valley spring-run and steelhead ESU's  
7/15/2004

**1. Flagged HSAs that should remain in the critical habitat proposal**

Upper Cottonwood Cr (552433) and Beegum Cr/Cottonwood Cr (552436) - CV steelhead

These HSAs have been flagged for economic exclusion from the Central Valley steelhead critical habitat designation. The following narrative represents the Sacramento Area Office's justification to include these watersheds as critical habitat for Central Valley steelhead.

Central Valley steelhead rely on high elevation headwater streams to survive and reproduce. McEwan and Jackson (1996) found that most tributaries to the Sacramento and San Joaquin River have been dammed, and that the amount of spawning and rearing habitat available is negligible compared to historic levels. Minor tributaries that do not have impassable dams, such as Mill and Deer Creeks, contain the last good available spawning habitat to steelhead in the Central Valley. McEwan and Jackson (1996) also believed that streams such as Cow, Battle, Clear, and Cottonwood Creeks offer the best opportunities for restoration of steelhead populations in the upper Sacramento River. Cottonwood Creek is the largest undammed tributary to the Sacramento River, and is one of only three east-side tributaries to the Sacramento River with the potential to support steelhead spawning and summer rearing. The Cottonwood Creek Basin is comprised of five HSAs. Of these five HSAs, the flagged units represent the most extensive amount of spawning and rearing habitat available to the species within the watershed. Inclusion of the flagged units as critical habitat is essential for the conservation value of the watershed as a whole. Additionally, the costs attributed to federal land management appear excessive and are not likely to represent actual costs.

**2. Customized exclusion proposals**

The NOAA Fisheries Sacramento Area Office proposes the following customized exclusions for HSAs that contain a combination of aquatic habitats that range from low to high conservation value to Central Valley spring-run Chinook salmon and Central Valley steelhead:

Mokelumne River (553120) - CV steelhead

The customized exclusion for this HSA would retain the Mokelumne River as critical habitat for Central Valley steelhead, and exclude Mosher Creek. Mosher lies in the southern part of this HSA and is actually part of the Calaveras River drainage. Steelhead are forced to use Mosher Creek during agricultural diversion operations. Rearing and migration habitats in the creek are very poor and thus it should not be included in the critical habitat determination for Central

Valley steelhead.

Lower Sacramento River (551000) - CV steelhead, CV spring-run Chinook salmon

The customized exclusion for this HSA would exclude the Sacramento River Deepwater Ship Channel from the W.G. Stone Locks, in West Sacramento, downstream to the confluence with Cache Slough. This customized exclusion would drop from consideration, the low-value habitat within the Deepwater Ship Channel while retaining the all other high value habitats for Central Valley spring-run Chinook salmon and Central Valley steelhead within the HSA.

**3. Potential exclusions based on biological value**

Due to their limited biological value, or limited extent of available habitat, the following HSAs were considered to have limited conservation value to the survival and recovery of the ESUs:

Central Valley steelhead

Upper Rock Creek - 550916

Upper Mud Creek - 550915

Central Valley Spring-run Chinook

Upper Cow - 550731

**4. Potential exclusions based on economics**

Central Valley steelhead

Little Cry Creek - 552110

Dry Creek (Mokelumne) - 553240

Cosumnes River - 553111

Alamo/Ulatis Creek - 551110

Central Valley spring-run Chinook salmon

Thomes Creek, upper - 552310

Upper Cottonwood Creek - 552433

Central/South Delta - 554400

lower American River - 551921