DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Parts 223 and 224

[Docket No. 040525161–5155–02; I.D. 052104F]

RIN No. 0648–AR93

Endangered and Threatened Species: Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs

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

ACTION: Final rule.

SUMMARY: We, NOAA's National Marine Fisheries Service (NMFS), are issuing final determinations to list 16 Evolutionarily Significant Units (ESUs) of West Coast salmon (chum, *Oncorhynchus keta*; coho, *O. kisutch*, sockeye, *O. nerka*; Chinook, *O. tshawytscha*; pink, *O. gorbuscha*) under the Endangered Species Act (ESA) of 1973, as amended. We have concluded that four ESUs are endangered, and twelve ESUs are threatened, in California, Oregon, Washington, and Idaho. Fifteen of these ESUs were previously listed as threatened or endangered under the ESA, and one ESU was previously designated as a candidate species. With respect to the Oregon Coast coho ESU and ten *O. mykiss* ESUs, we have found that substantial disagreement regarding the sufficiency or accuracy of the relevant data precludes making final listing determinations at this time, and accordingly we are extending the deadline for making our final determinations for these 11 ESUs for an additional 6 months. The findings regarding the extension of the final listing determination for the Oregon Coast coho ESU and for the ten *O. mykiss* ESUs appear in the Proposed Rules section in today's **Federal Register** issue. The ten *O. mykiss* ESUs were previously listed and remain listed pending final agency action.

Also in this notice, we are finalizing amendments to the ESA 4(d) protective regulations for threatened salmonid ESUs. As part of the proposed listing determinations in June 2004, we proposed changes to these protective regulations to provide the necessary flexibility to ensure that fisheries and artificial propagation programs are managed consistently with the conservation needs of ESA-listed ESUs, and to clarify the existing regulations so that they can be more efficiently and effectively interpreted and followed by all affected parties.

Finally, we are soliciting biological and economic information relevant to designating critical habitat for the Lower Columbia River coho salmon ESU.

DATES: This final rule is effective August 29, 2005.

ADDRESSES: Correspondence concerning this final rule may be addressed to Chief, Protected Resources Division, Northwest Region, NMFS, 1201 Lloyd Boulevard, Suite 1100, Portland, Oregon, 97232–1274; or Chief, Protected Resources Division, Southwest Region, NMFS, 501 West Ocean Blvd., Suite 4200, Long Beach, CA, 90802–4213.

Information relevant to designating critical habitat for the Lower Columbia River coho ESU may be submitted by: standard mail to Steve Stone, Protected Resources Division, Northwest Region, NMFS, 1201 Lloyd Boulevard, Suite 1100, Portland, Oregon, 97232–1274; e-mail to *LCRcoho_CH.nwr@noaa.gov*; or fax to (503) 230–5441. Please include the identifier ''Information RE: Critical Habitat for Lower Columbia River Coho'' with any information submitted.

FOR FURTHER INFORMATION CONTACT: For further information regarding the final listing determinations and the final amendments to the 4(d) protective regulations please contact Scott Rumsey, NMFS, Northwest Region, (503) 872–2791; Craig Wingert, NMFS, Southwest Region, (562) 980–4021; or Marta Nammack, NMFS, Office of Protected Resources, (301) 713–1401. For further information concerning the information request regarding critical habitat for Lower Columbia River coho salmon, please contact Steve Stone, NMFS, Northwest Region, (503) 231–2317.

SUPPLEMENTARY INFORMATION: The ESA listing determinations and the amended 4(d) protective regulations for threatened ESUs described in this document are effective August 29, 2005. The take prohibitions applicable to threatened species do not apply to activities specified in an application for a permit or a 4(d) approval for scientific purposes or to enhance the conservation or survival of the species, provided that the application has been received by the Assistant Administrator for Fisheries, NOAA (AA), no later than August 29, 2005. This ''grace period'' for pending research and enhancement applications will remain in effect until the issuance or denial of authorization, or December 28, 2005, whichever occurs earliest. Additionally, biological and economic information regarding critical habitat for the Lower Columbia River coho ESU must be received no later than 5 p.m. P.S.T. on August 29, 2005 (*see* **ADDRESSES** and Information Solicited).

Organization of This Final Rule

This **Federal Register** notice describes the final listing determinations for 16 ESUs of West Coast salmon under the ESA, as well as final amendments to the 4(d) protective regulations for threatened ESUs. The pages that follow summarize the comments and information received in response to the proposed listing determinations and proposed protective regulations (69 FR 33102; June 14, 2004), describe any changes from the proposed listing determinations and proposed protective regulations, and detail the final listing determinations for 16 ESUs and the final protective regulations for threatened ESUs. To assist the reader, the content of this notice is organized as follows:

habitat for the Lower Columbia River coho ESU

IX. Description of the *Classification*, NMFS' compliance with various laws and executive orders with respect to this rulemaking (*e.g.*, National Environmental Policy Act, Regulatory Flexibility Act)

X. Description of amendments to the Code of Federal Regulations (*List of Subjects*). This section itemizes the specific changes to Federal law being made based on the foregoing information:

- Amendments to the list of threatened and endangered species
- Amendments to the protective regulations for threatened West Coast salmonids

Background

Listing Species Under the Endangered Species Act

NMFS is responsible for determining whether species, subspecies, or distinct population segments (DPSs) of Pacific salmon and steelhead are threatened or endangered under the Endangered Species Act (ESA) (16 U.S.C. 1531 *et seq*). To be considered for listing under the ESA, a group of organisms must constitute a ''species,'' which is defined in section 3 of the ESA to include ''any subspecies of fish or wildlife or plants, and any *distinct population segment* [emphasis added] of any species of vertebrate fish or wildlife which interbreeds when mature.'' In this notice, we are issuing final listing determinations for DPSs of Pacific salmon. To qualify as a DPS, a Pacific salmon population must be substantially reproductively isolated from other conspecific populations and represent an important component in the evolutionary legacy of the biological species. A population meeting these criteria is considered to be an ESU (56 FR 58612; November 20, 1991). In our previous listing determinations for Pacific salmonids under the ESA, we have treated an ESU as constituting a DPS, and hence a ''species,'' under the ESA.

Section 3 of the ESA defines an endangered species as ''any species which is in danger of extinction throughout all or a significant portion of its range'' and a threatened species as one ''which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' The statute lists factors that may cause a species to be threatened or endangered (ESA section 4(a)(1)): (a) The present or threatened destruction, modification, or curtailment of its habitat or range; (b) overutilization for commercial, recreational, scientific, or educational purposes; (c) disease or predation; (d) the inadequacy of existing regulatory mechanisms; or (e) other natural or manmade factors affecting its continued existence.

Section 4(b)(1)(A) of the ESA requires NMFS to make listing determinations based solely on the best scientific and commercial data available after conducting a review of the status of the species and after taking into account efforts being made to protect the species. We follow a four-step process in making listing determinations for Pacific salmon: (1) We first determine the ESU or species under listing consideration; (2) we determine the viability of the defined ESU and the factors that have led to its decline; (3) we assess efforts being made to protect the ESU, determining if these efforts adequately mitigate threats to the species; and (4) based on the foregoing steps and the statutory listing factors, we determine if the ESU is threatened or endangered, or does not warrant listing under the ESA.

Life History of West Coast Salmon

The specific life-history characteristics of the subject species are summarized in the proposed listing determinations notice (69 FR 33102; June 14, 2004). These species addressed in this notice each exhibit anadromy, meaning that adults migrate from the ocean to spawn in freshwater lakes and streams where their offspring hatch and rear prior to migrating to the ocean to forage until maturity. The migration and spawning times vary considerably among and within species and populations. At spawning, adults pair to lay and fertilize thousands of eggs in freshwater gravel nests or ''redds'' excavated by females. Depending on lake/stream temperatures, eggs incubate for several weeks to months before hatching as ''alevins'' (a larval life stage dependent on food stored in a yolk sac). Following yolk sac absorption, alevins emerge from the gravel as young juveniles called ''fry'' and begin actively feeding. Depending on the species and location, juveniles may spend from a few hours to several years in freshwater areas before migrating to the ocean. The physiological and behavioral changes required for the transition to salt water result in a distinct ''smolt'' stage in most species. En route to the ocean the juveniles may spend from a few days to several weeks in the estuary, depending on the species. The highly productive estuarine environment is an important feeding and acclimation area for juveniles preparing to enter marine waters.

Juveniles and subadults typically spend from 1 to 5 years foraging over thousands of miles in the North Pacific Ocean before returning to freshwater to spawn. Some species, such as coho and Chinook salmon, have precocious life-history types (primarily male fish) that mature and spawn after only several months in the ocean. Spawning migrations known as ''runs'' occur throughout the year, varying in time by species and location. Most adult fish return or ''home'' with great fidelity to spawn in their natal stream, although some do stray to non-natal streams. Salmon species die after spawning.

Past Pacific Salmonid ESA Listings and the Alsea Decision

Pacific salmon ESUs in California and the Pacific Northwest have suffered broad declines over the past hundred years. Since 1991, we have conducted ESA status reviews of six species of Pacific salmonids in California, Oregon, Washington, and Idaho, identifying 52 ESUs, with 25 ESUs currently listed as threatened or endangered (see the Proposed Rule, 69 FR 33102; June 14, 2004, for a detailed summary of previous listing actions for West Coast salmonid ESUs). In past status reviews, we based our extinction risk assessments on whether the naturally spawned fish in an ESU are self-sustaining in their natural ecosystem over the long term. We listed as ''endangered'' those ESUs whose naturally spawned populations were found to have a present high risk of extinction, and listed as ''threatened'' those ESUs whose naturally spawned populations were found likely to become endangered in the foreseeable future.

In past status reviews we did not explicitly consider the contribution of hatchery fish to the overall viability of an ESU, or whether the presence of hatchery fish within the ESU might have the potential for reducing the risk of extinction of the ESU or the likelihood that the ESU would become endangered in the foreseeable future. We generally considered artificial propagation as a threat to the long-term persistence of the naturally spawned populations within an ESU. Under a 1993 Interim Policy on the consideration of artificially propagated Pacific salmon and steelhead under the ESA (58 FR 17573; April 5, 1993), if it was determined that an ESU warranted listing, we then reviewed the associated hatchery stocks to determine if they were part of the ESU. We did not include hatchery stocks in an ESU if: (1) Information indicated that the hatchery stock was of a different genetic lineage than the listed natural populations; (2) information indicated that hatchery practices had produced appreciable

changes in the ecological and life-history characteristics of the hatchery stock and these traits were believed to have a genetic basis; or (3) there was substantial uncertainty regarding the relationship between hatchery fish and the existing natural population(s). The Interim Policy provided that hatchery salmon and steelhead found to be part of an ESU would not be listed under the ESA unless they were found to be essential for the ESU's recovery (*i.e.*, if we determined that the hatchery stock contained a substantial portion of the genetic diversity remaining in the ESU). The result of the Interim Policy was that a listing determination for an ESU depended solely upon the relative health of the natural populations in an ESU, and that most hatchery stocks determined to be part of an ESU were excluded from any listing of the ESU.

Subsequently, in *Alsea Valley Alliance* v. *Evans*, 161 F. Supp. 2d 1154 (D. Or. 2001)(*Alsea*), the U.S. District Court in Eugene, Oregon, set aside our 1998 ESA listing of Oregon Coast coho salmon (*O. kisutch*) because it impermissibly excluded hatchery fish within the ESU from listing. The court ruled that the ESA does not allow listing a subset of a DPS and that, since we had found an ESU constitutes a DPS, we had improperly excluded stocks from the listing that we had determined were part of the ESU. Although the *Alsea* ruling affected only one ESU, the interpretive issue raised by the ruling called into question the validity of the Interim Policy implemented in nearly all of our Pacific salmonid listing determinations.

Initiation of Coast-Wide ESA Status Reviews

Following the *Alsea* ruling, NMFS received a total of nine petitions seeking to delist, or to redefine and list, 17 listed salmonid ESUs (see the Proposed Rule for a summary of the petitions; 69 FR 33102; June 14, 2004). We determined that seven of the petitions presented substantial scientific and commercial information that the petitioned actions may be warranted for 16 of the subject ESUs (67 FR 6215, February 11, 2002; 67 FR 40679, June 13, 2002; 67 FR 48601, July 25, 2002). As part of our response to the ESA interpretive issues raised by the *Alsea* ruling, we announced that we would revise the 1993 Interim Policy, and we elected to initiate status reviews for 11 ESUs in addition to the 16 ESUs for which we had accepted delisting/listing petitions (67 FR 6215, February 11, 2002; 67 FR 79898, December 31, 2002).

NMFS' Pacific Salmonid Biological Review Team (BRT) (an expert panel of scientists from several Federal agencies including NMFS, FWS, and the U.S. Geological Survey) reviewed the viability and extinction risk of naturally spawning populations in the 27 ESUs, 16 of which are the subject of this proposed rule (NMFS, 2003b). The BRT evaluated the risk of extinction based on the performance of the naturally spawning populations in each of the ESUs under the assumption that present conditions will continue into the future. The BRT did not explicitly consider artificial propagation in its evaluations.

The BRT assessed ESU-level extinction risk (as indicated by the viability of the naturally spawning populations) at two levels: First, at the individual population level, then at the overall ESU level. The BRT used factors for ''Viable Salmonid Populations'' (VSP; McElhany *et al.*, 2000) to guide its risk assessments. The VSP factors were developed to provide a consistent and logical reference for making viability determinations and are based on a review and synthesis of the conservation biology and salmon literature. Individual populations were evaluated according to the four VSP factors: abundance, productivity, spatial structure (including connectivity), and diversity. These four parameters are universal indicators of species' viability, and individually and collectively function as reasonable predictors of extinction risk. After reviewing all relevant biological information for the populations in a particular ESU, the BRT ascribed an ESU-level risk score for each of the four VSP factors.

The BRT described and assessed ESU-level risk for each of the VSP factors and the ESU-level extinction risk based on the performance of the naturally spawning populations. The BRT's assessment of ESU-level extinction risk uses categories that correspond to the definitions of endangered species and threatened species, respectively, in the ESA: in danger of extinction throughout all or a significant portion of its range, likely to become endangered within the foreseeable future throughout all or a significant portion of its range, or neither. In general, these evaluations did not include consideration of the potential contribution of hatchery stocks to the viability of ESUs, or evaluate efforts being made to protect the species. Therefore, the BRT's findings are not recommendations regarding listing. The BRT's ESU-level extinction risk assessment reflects the BRT's professional scientific judgment, guided by the analysis of the VSP factors, as well as by expectations about the likely interactions among the individual VSP factors. For example, a single VSP factor with a ''High Risk'' score might be sufficient to result in an overall extinction risk assessment of ''in danger of extinction,'' but a combination of several VSP factors with more moderate risk scores could also lead to the same assessment, or a finding that the ESU is ''likely to become endangered.''

To assist in determining the ESU membership of individual hatchery stocks, a Salmon and Steelhead Hatchery Assessment Group (SSHAG), composed of NMFS scientists from the Northwest and Southwest Fisheries Science Centers, evaluated the best available information describing the relationships between hatchery stocks and natural ESA-listed salmon and anadromous *O. mykiss* populations in the Pacific Northwest and California. The SSHAG produced a report, entitled ''Hatchery Broodstock Summaries and Assessments for Chum, Coho, and Chinook Salmon and Steelhead Stocks within Evolutionarily Significant Units Listed under the Endangered Species Act'' (NMFS, 2003a), describing the relatedness of each hatchery stock to the natural component of an ESU on the basis of stock origin and the degree of known or inferred genetic divergence between the hatchery stock and the local natural population(s). We used the information presented in the SSHAG Report to determine the ESU membership of those hatchery stocks within the historical geographic range of a given ESU. Our assessment of individual hatchery stocks and our findings regarding their ESU membership are detailed in the Salmonid Hatchery Inventory and Effects Evaluation Report (NMFS, 2004b).

The assessment of the effects of ESU hatchery programs on ESU viability and extinction risk is also presented in the Salmonid Hatchery Inventory and Effects Evaluation Report (NMFS, 2004b). The Report evaluates the effects of hatchery programs on the likelihood of extinction of an ESU on the basis of the four VSP factors (*i.e.*, abundance, productivity, spatial structure, and diversity) and how artificial propagation efforts within the ESU affect those factors. In April 2004, we convened an Artificial Propagation Evaluation Workshop of Federal scientists and managers with expertise in salmonid artificial propagation. The Artificial Propagation Evaluation Workshop reviewed the BRT's findings (NMFS, 2003a), evaluated the Salmonid Hatchery Inventory and Effects Evaluation Report (NMFS, 2004b), and assessed the overall extinction risk of ESUs with associated hatchery stocks. The discussions and conclusions of the

Artificial Propagation Evaluation Workshop are detailed in a workshop report (NMFS, 2004c). In this document, the extinction risk of an ESU ''in-total'' refers to the assessed level of extinction risk after considering the contributions to viability by all components of the ESU (hatchery origin, natural origin, anadromous, and resident).

On June 3, 2004, we published in the **Federal Register** a proposed policy for the consideration of hatchery-origin fish in ESA listing determinations (Hatchery Listing Policy; 69 FR 31354). On June 14, 2004, we proposed listing determinations for the 27 ESUs under review, proposing that four ESUs be listed as threatened and 23 ESUs be listed as endangered (69 FR 33102). We proposed maintaining the existing ESA listing status for 22 ESUs: Two sockeye ESUs (the endangered Snake River and threatened Ozette Lake sockeye ESUs); eight Chinook ESUs (the endangered Upper Columbia River spring-run ESU, and the threatened Central Valley spring-run, California Coastal, Upper Willamette River, Lower Columbia River, Puget Sound, Snake River fall-run, and Snake River spring/summer-run Chinook ESUs); one coho ESU (the threatened Southern Oregon/Northern California Coast coho ESU); two chum ESUs (the threatened Columbia River and Hood Canal summer-run chum ESUs); and nine *O. mykiss* ESUs (the endangered Southern California *O. mykiss* ESU, and the threatened South-Central California Coast, Central California Coast, California Central Valley, Northern California, Upper Willamette River, Lower Columbia River, Middle Columbia River, and Snake River Basin *O. mykiss* ESUs). We proposed revising the status of three ESA-listed ESUs: The endangered Sacramento River winter-run Chinook and Upper Columbia River *O. mykiss* ESUs were proposed for threatened status; and the threatened Central California Coast coho ESU was proposed for endangered status. Finally, we proposed that two ESUs designated as candidate species be listed as threatened: the Oregon Coast coho and Lower Columbia River coho ESUs. Also as part of the proposed listing determinations, we proposed amending the section 4(d) protective regulations for threatened ESUs to: Exclude listed hatchery fish marked by a clipped adipose fin and resident fish from the ESA take prohibition; and simplify existing 4(d) protective regulations so that the same set of limits apply to all threatened ESUs.

Summary of Comments and Information Received in Response to the Proposed Rule

With the publication of the proposed listing determinations for 27 ESUs we announced a 90-day public comment period extending through September 13, 2004. In **Federal Register** notices published on August 31, 2004 (69 FR 53093), September 9, 2004 (69 FR 54637), and October 8, 2004 (69 FR 61347), we extended the public comment period for the proposed policy through November 12, 2004. The public comment period for the proposed listing determinations was open for 151 days. We held 14 public hearings (at eight locations in the Pacific Northwest, and six locations in California) to provide additional opportunities and formats to receive public input (69 FR 53039, August 31, 2004; 69 FR 54620, September 9, 2004; 69 FR 61347, October 8, 2004). Additionally, pursuant to the requirements of the National Environmental Policy Act (NEPA) of 1969, we conducted an Environmental Assessment (EA) analyzing the proposed amendments to the 4(d) protective regulations for threatened salmonids. As part of the proposed listing determinations and the proposed amendments to the 4(d) protective regulations, we announced that a draft of the EA was available from NMFS upon request (69 FR at 33172; June 14, 2004). Additionally, on November 15, 2004, we published a notice of availability in the **Federal Register** soliciting comment on the draft EA for an additional 30 days (69 FR 65582).

A joint NMFS/FWS policy requires us to solicit independent expert review from at least three qualified specialists, concurrent with the public comment period (59 FR 34270; July 1, 1994). We solicited technical review of the proposed listing determinations from over 50 independent experts selected from the academic and scientific community, Native American tribal groups, Federal and state agencies, and the private sector. In December 2004 the Office of Management and Budget (OMB) issued a Final Information Quality Bulletin for Peer Review establishing minimum peer review standards, a transparent process for public disclosure, and opportunities for public input. The OMB Peer Review Bulletin, implemented under the Information Quality Act (Pub. L. 106–554), is intended to provide public oversight on the quality of agency information, analyses, and regulatory activities, and applies to information disseminated on or after June 16, 2005. The independent expert review under the joint NMFS/FWS peer review policy, and the comments received from several academic societies and expert advisory panels, collectively satisfy the requirements of the OMB Peer Review Bulletin (NMFS, 2005a).

In response to the requests for information and comments on the proposed hatchery listing policy, the proposed listing determinations, and the proposed amendments to the 4(d) protective regulations, we received over 28,250 comments by fax, standard mail, and e-mail. The majority of the comments received were from interested individuals who submitted form letters or form e-mails. Comments were also submitted by state and tribal natural resource agencies, fishing groups, environmental organizations, home builder associations, academic and professional societies, expert advisory panels (including NMFS' Recovery Science Review Panel, the Independent Science Advisory Board, and the State of Oregon's Independent Multidisciplinary Science Team), farming groups, irrigation groups, and individuals with expertise in Pacific salmonids. The majority of respondents focused on the proposed Hatchery Listing Policy, although many respondents also included comments relevant to the proposed listing determinations and the proposed amendments to the 4(d) protective regulations. The public comments were generally critical of the proposed hatchery listing policy, for a variety of reasons, but were generally favorable of the proposed listing determinations and the manner in which the proposed hatchery listing policy was implemented. Those few comments that addressed the proposed amendments to the 4(d) protective regulations expressed concerns about the practical implications of the proposed changes on the management of hatchery programs as well as on tribal, recreational, and commercial salmon and steelhead fisheries.

We also received comments from four of the independent experts from whom we had requested technical review of the proposed listing determinations. The independent expert reviews were generally supportive of the scientific principles underlying the application of the proposed Hatchery Listing Policy in the proposed listing determinations. However, the reviewers noted several concerns with the proposed Hatchery Listing Policy including: Vague and imprecise policy language; an apparent de-emphasis of the importance of naturally spawned self-sustaining populations for the conservation and recovery of salmonid ESUs, and the goal

of the ESA to conserve the ecosystems upon which they depend; accumulating long-term adverse impacts of artificial propagation due to unavoidable artificial selection and domestication in the hatchery environment; and the lack of scientific evidence that artificial propagation can contribute to the productivity and conservation of viable natural populations over the long term. Two of the reviewers felt that hatchery fish are inherently different from wild fish and should not be included in ESUs, and were concerned that the inclusion of hatchery fish in ESUs would jeopardize the conservation and recovery of native salmonid populations in their natural ecosystems. The other two reviewers were supportive of the scientific basis for including hatchery fish in ESUs, but felt that the policy did not appropriately emphasize that the conservation and recovery of listed ESUs depends upon the viability of wild populations and natural ecosystems over the long term.

There was substantial overlap between the comments from the independent expert reviewers, the independent scientific panels and academic societies, and the substantive public comments. Some of the comments received were not directly pertinent to the proposed listing determinations or the proposed amendments to the 4(d) protective regulations. We will consider and address comments relating to other determinations (for example, the proposed Hatchery Listing Policy (69 FR 31354, June 3, 2004), the proposed critical habitat designations for 20 West Coast salmonid ESUs (69 FR 71880, December 10, 2004; 69 FR 74572, December 14, 2004), and the remanded biological opinion on the Federal Columbia River Power System (see *http://www.salmonrecovery.gov/R_biop_final.shtml*)) in the context of those determinations. With respect to comments received on the Hatchery Listing Policy, the summary of and response to comments below is confined to the implementation of the policy in delineating the ESUs for consideration, and determining their ESA listing status. The reader is referred to the final Hatchery Listing Policy elsewhere in this edition of the **Federal Register** for a summary of the comments received regarding the legal and policy interpretations articulated in the policy.

The summary of comments and our responses below are organized into four general categories: (1) General comments on the consideration of artificial propagation in the proposed listing determinations; (2) general comments on the consideration of efforts being made to protect the species; (3) comments on the proposed amendments to the protective regulations; and (4) comments on ESU-specific issues (for example, the ESU membership of specific hatchery stocks, level of extinction risk assessed for an ESU, and the consideration of specific conservation efforts being made to protect and conserve an ESU).

General Comments on the Consideration of Artificial Propagation

Issue 1: Several commenters felt that our implementation of the Hatchery Listing Policy's threshold for including hatchery stocks in a given ESU was inconsistent among hatchery programs both within and among ESUs. The commenters felt that in most circumstances quantitative information on the genetic differentiation of a specific hatchery stock relative to the local natural population(s) is not available. The commenters argued that, given the poor availability of genetic data, determinations of whether a given hatchery stock is part of an ESU are ambiguous, highly subjective, and arbitrary.

Response: We agree with the commenters that in many cases empirical genetic data are not available to quantitatively assess the level of genetic differentiation and reproductive isolation of a hatchery stock relative to the local natural population(s) in an ESU. The ESA requires that we review the status of the species based upon the ''best available'' scientific and commercial information, and in many instances the agency must rely on qualitative analyses of surrogate information when quantitative genetic data are not available to assist in determining the ''species'' under consideration. For this rulemaking, in lieu of empirical genetic data, we relied on a number of strong biological indicators to inform a qualitative assessment of the level of reproductive isolation and evolutionary divergence, such as stock isolation, selection of run timing, the magnitude and regularity of incorporating natural broodstock, the incorporation of out-of-basin or out-of-ESU eggs or fish, mating protocols, behavioral and life-history traits, *etc.*

Issue 2: One commenter disapproved of our approach of evaluating the ESU membership of hatchery fish in terms of individual hatchery programs. The commenter recommended that ESU membership be based on broodstock source, recognizing that a given broodstock may be propagated at several hatchery facilities. The commenter felt that our approach of evaluating hatchery programs confused three important issues: the broodstock source, history, and genetic management of the hatchery fish; the management practices of the hatchery program producing the hatchery fish (such as the timing and location of releasing hatchery fish); and the life-history characteristics of the local natural population where a hatchery stock is being released. The commenter was concerned that evaluating and listing hatchery fish by hatchery program could erroneously result in one group of hatchery fish from a given broodstock source being included in an ESU, and another group of hatchery fish from the same broodstock source not being included in the ESU.

Response: The commenter is correct that our approach could, and did, result in hatchery programs being excluded from an ESU despite having been derived from the same broodstock lineage as other hatchery programs included in the ESU. However, we feel it would be inappropriate to determine the ESU membership of hatchery fish solely on the basis of broodstock lineage to the exclusion of a case-by-case analysis of the past and present practices of hatchery programs producing fish within the geographic range of an ESU. The commenter correctly points out that individual hatchery programs may differ in their broodstock lineage, hatchery practices, and the specific ecological conditions into which the hatchery fish are released. The broodstock used represents the raw genetic resources brought into a hatchery program, and provides one useful predictor of ESU membership. How these raw genetic resources are managed and the specific environmental and ecological conditions into which the hatchery fish are released are also key determinants of whether a group of hatchery fish is part of an ESU. Critical considerations in evaluating the relationship of hatchery fish to an ESU include whether it reflects: (1) The level of reproductive isolation characteristic of the natural populations in the ESU; and (2) the ecological, life-history, and genetic diversity that compose the ESU's evolutionary legacy. Information regarding the origin, isolation, and broodstock source and mating protocols of a hatchery program help determine its level of reproductive isolation from the local natural population(s) in an ESU. Information regarding the behavioral and life-history traits of the hatchery fish produced by a program relative to the locally adapted natural populations help inform evaluations of whether the hatchery fish are

representative of the ESU's evolutionary legacy. We feel that it is appropriate to evaluate the ESU membership of hatchery fish with respect to the specific hatchery programs producing them.

Issue 3: Many commenters felt that hatchery-origin fish should not be included in ESUs. The commenters discussed scientific studies demonstrating that hatchery-origin fish differ from naturally-spawned fish in physical, physiological, behavioral, reproductive and genetic traits. Commenters argued that hatchery-origin and natural-origin fish should not be included in the same ESU because of these differences.

Response: We do not agree that hatchery-origin fish should be universally excluded from ESUs. As articulated in the final Hatchery Listing Policy in this edition of the **Federal Register**, important genetic resources for the conservation and recovery of an ESU can reside in fish spawned in a hatchery as well as in fish spawned in the wild. The established practice of incorporating local natural-origin fish into hatchery broodstock can result in hatchery stocks and natural populations that are not reproductively isolated and that share the same genetic and ecological evolutionary legacy. Under the final Hatchery Listing Policy we determine the ESU membership of hatchery fish by conducting a case-by-case evaluation of the relationship of individual hatchery stocks to the local natural population(s) on the basis of: Stock origin and the degree of known or inferred genetic divergence between the hatchery stock and the local natural population(s); and the similarity of hatchery stocks to natural populations in ecological and life-history traits. Although certain hatchery programs will be determined to be reproductively isolated and not representative of the evolutionary legacy of an ESU (and hence not part of the ESU), we do not believe that such a conclusion is universally warranted for all hatchery stocks. Many hatchery stocks are reproductively integrated with natural populations in an ESU and continue to exhibit the local adaptations composing the ESU's ecological and genetic diversity. We recognize that artificial selection in the hatchery environment may be unavoidable, that a well-managed hatchery stock could eventually diverge from the evolutionary lineage of an ESU, and that a poorly managed hatchery stock could quickly diverge from the evolutionary lineage of an ESU. However, the potential for divergence is not adequate justification for the universal exclusion of hatchery fish from an ESU. Consistent with the ESU policy, a hatchery program should be excluded from an ESU if the hatchery stock exhibits genetic, ecological or life-history traits indicating that it has diverged from the evolutionary legacy of the ESU.

Issue 4: Many commenters felt that hatchery-origin fish should be considered only as a threat to the persistence of Pacific salmon and *O. mykiss* ESUs. The commenters cited scientific studies indicating that artificial selection in hatcheries can result in diminished reproductive fitness in hatchery-origin fish in only one generation. Commenters also noted scientific studies describing negative ecological, reproductive, and genetic effects of hatchery stocks on natural populations. The commenters were concerned that including hatchery fish in assessments of extinction risk reduces the importance of conserving self-sustaining populations in the wild, and inappropriately equates naturally produced fish and fish produced with ease in a hatchery.

Response: We do not agree that all hatchery programs, and the hatchery fish they produce, can be universally regarded as threats to salmon and *O. mykiss* ESUs. There are so many different ways in which hatchery-origin fish interact with natural populations and the environment that there can be no uniform conclusion about the potential contribution of hatchery-origin fish to the survival of an ESU. As described in the final Hatchery Listing Policy elsewhere in this edition of the **Federal Register**, the consideration of hatchery-origin fish in evaluating the level of extinction risk of an ESU requires a case-by-case analysis of the risks, benefits, and uncertainties of specific hatchery stocks within the geographical area of an ESU. The risks and benefits of artificial propagation to the survival of an ESU over the long term are highly uncertain. The presence of well distributed self-sustaining natural populations that are ecologically and genetically diverse provides the most certain predictor that an ESU is not likely to become endangered in the foreseeable future. The presence of carefully designed and operated hatchery programs, under certain circumstances, may mitigate the risk of extirpation for severely depressed populations in the short term, and thereby reduce an ESU's immediate risk of extinction. Whether the contributions of a hatchery program or group of hatchery programs will warrant an ESU being listed as ''threatened'' rather than ''endangered'' will depend upon the specific demographic risks facing natural populations within the ESU, the availability and condition of the surrounding natural habitat, as well as the factors that led to the ESU's decline and current threats limiting the ESU's recovery.

Issue 5: A few commenters felt that extinction risk should be evaluated based on the total abundance of fish within the defined ESU without discriminating between fish of hatchery or natural origin. These commenters contended that the District Court in *Alsea* ruled that once an ESU is defined, risk determinations should not discriminate among its components. The commenters described the risk of extinction as the chance that there will be no living representatives of the species, and that such a consideration must not be biased toward a specific means of production (artificial or natural).

Response: The *Alsea* ruling does not require any particular approach to assessing extinction risk. The court ruled that if it is determined that a DPS warrants listing, all members of the defined species must be included in the listing. The court did not rule on how the agency should determine whether the species is in danger of extinction or likely to become so in the foreseeable future. The commenters assert that the viability of an ESU is determined by the total numbers of fish. The risk of extinction of an ESU depends not just on the abundance of fish, but also on the productivity, spatial distribution, and diversity of its component populations (Viable Salmonid Populations (VSP) factors; McElhany *et al.*, 2000; Ruckelshaus *et al.*, 2002). In addition to having sufficient abundance, viable ESUs and populations have sufficient productivity, diversity, and a spatial distribution to survive environmental variation and natural and human catastrophes. The commenters also assume that hatchery managers will continue to produce the same numbers of the same stock and quality of fish with the same success as in the past. In many cases, such assumptions are not warranted.

Issue 6: One commenter noted that the proposed ESU delineations included ''naturally spawned fish'' within a given geographical area, and was concerned that as defined the ESUs might be misinterpreted to include the naturally spawned progeny of hatchery fish not included in the ESU. The commenter was concerned that the naturally-spawned progeny of these out-of-ESU hatchery fish would inadvertently be afforded the protections of the ESA, potentially constraining conservation measures intended to reduce the

negative impacts of these fish on listed local natural populations.

Response: The final rule defines ESUs as naturally spawned fish originating from a defined geographic area, plus hatchery fish from certain enumerated hatchery programs. It is possible that within any geographic area there may be out-of-ESU hatchery strays spawning with other out-of-ESU hatchery strays to produce progeny that biologically would not be considered part of the ESU. As a practical matter, however, it is seldom possible to distinguish the progeny of these matings from the progeny of within-ESU natural spawners, without elaborate (and potentially inconclusive) tests. Accordingly, we have defined the ESUs to make the listings unambiguous and the ESA protections easily enforceable.

Of the 16 ESUs addressed in this final rule, four ESUs have associated out-of-ESU hatchery programs: the Lower Columbia River Chinook, Upper Columbia River spring-run Chinook, Puget Sound Chinook, and Snake River spring/summer-run Chinook ESUs. In some instances the progeny of out-of-ESU hatchery fish may be distinguished by distinct patterns of habitat use, spawning location, run timing, or other means. In such a case we may determine that protection of those fish is not necessary for conservation of the ESU and approve actions that result in take, through sections 4(d), 7(a)(2), 10(a)(1)(A) or 10(a)(1)(B) of the ESA, as appropriate. NMFS will also use these statutory authorities to minimize harmful impacts to the listed ESUs from out-of-ESU hatchery fish spawning in the wild.

General Comments on the Consideration of Protective Efforts

Issue 7: Several commenters criticized the evaluation of efforts being made to protect the species in the proposed listing determinations (see 69 FR at 33142 through 33157; June 14, 2004). The commenters argued that the joint NMFS/FWS ''Policy for Evaluation of Conservation Efforts When Making Listing Decisions'' (''PECE''; 68 FR 15100; March 28, 2003) does not apply to currently listed species. In addition to this criticism the commenters felt that our treatment of protective efforts in the proposed listing determinations failed to address the criteria required under PECE for evaluating the certainty of implementation and effectiveness of protective efforts. (The commenters also provided criticisms specific to the consideration of protective efforts for the Sacramento River winter-run Chinook ESU, see Issue 13 in the ''Comments on ESU-specific Issues'' section, below).

Response: Section 4(b)(1)(A) of the ESA requires the Secretary of Commerce to make listing determinations ''solely on the basis of the best scientific and commercial data available * * * after conducting a review of the status of the species *and after taking into account those efforts, if any, being made * * * to protect such species*'' (emphasis added). When making listing determinations, we therefore evaluate efforts being made to protect the species to determine if those measures reduce the threats facing an ESU and ameliorate its assessed level of extinction risk. In judging the efficacy of protective efforts, we rely on the guidance provided in PECE. PECE provides direction for the consideration of protective efforts identified in conservation agreements, conservation plans, management plans, or similar documents (developed by Federal agencies, state and local governments, tribal governments, businesses, organizations, and individuals) that have not yet been implemented, or have been implemented but have not yet demonstrated effectiveness. The policy articulates 15 criteria for evaluating the certainty of implementation and effectiveness of protective efforts to aid in determination of whether a species should be listed as threatened or endangered. Evaluations of the certainty an effort will be implemented include whether: The necessary resources (*e.g.*, funding and staffing) are available; the requisite agreements have been formalized such that the necessary authority and regulatory mechanisms are in place; there is a schedule for completion and evaluation of the stated objectives; and (for voluntary efforts) the necessary incentives are in place to ensure adequate participation. The evaluation of the certainty of an effort's effectiveness is made on the basis of whether the effort or plan: establishes specific conservation objectives; identifies the necessary steps to reduce threats or factors for decline; includes quantifiable performance measures for the monitoring of compliance and effectiveness; incorporates the principles of adaptive management; and is likely to improve the species' viability at the time of the listing determination.

The commenters are correct that PECE does not explicitly apply to changing a species' listing status from endangered to threatened, or to delisting actions. NMFS and FWS noted that recovery planning is the appropriate vehicle to provide case-by-case guidance on the actions necessary to delist or change a species' listing status. The agencies left open whether specific policy guidance would be developed to instruct the consideration of conservation efforts for the purposes of changing a species' listing status or delisting a species, and such guidance has not yet been developed. Recovery planning efforts for the listed ESUs under review have not progressed to the point that they can provide guidance on the specific actions that would inform a decision to delist or change an ESU's listing status. In lieu of further policy guidance, PECE provides a useful and appropriate general framework to guide consistent and predictable evaluations of protective efforts.

We agree with the commenters that the regional summary of protective efforts provided as part of the proposed listing determinations does not provide a detailed treatment of the fifteen criteria articulated in PECE. However, only one of the proposed listings for the 16 ESUs addressed in this notice relied on the determination that protective efforts ameliorated risks to an ESU's abundance, productivity, spatial structure, and diversity as a basis for proposing that a previously endangered species be listed as threatened (the Sacramento River winter-run Chinook ESU). (The final listing determination for the Sacramento River winter-run Chinook ESU does not rely on an evaluation of protective efforts.) Our review of protective efforts provided in the proposed listing determinations concluded that the efforts do not as yet individually or collectively provide sufficient certainty of implementation and effectiveness to alter the assessed level of extinction risk for the other ESUs under review. A detailed documentation of the fifteen criteria articulated in PECE is not necessary unless we rely on protective efforts to overcome our assessment of extinction risk and the five factors identified in ESA section 4(a)(1).

Comments on Protective Regulations

Issue 8: Several commenters believe the ESA does not allow us to apply different levels of protections to hatchery and natural-origin fish in an ESU by not applying the take prohibitions to threatened hatchery fish that have had their adipose fin removed prior to release into the wild. The commenters argue that the *Alsea* ruling found that all fish included in an ESU must be protected equally if it is found that the ESU in-total warrants listing.

Response 14: The *Alsea* ruling does not require us to implement protective regulations equally among components of threatened ESUs. The *Alsea* ruling found that the ESA does not allow us to

list a subset of a DPS or ESU, and that all components of an ESU (natural populations, hatchery stocks, and resident populations) must be included in a listing if it is determined that an ESU warrants listing as threatened or endangered.

The section 9(a) take prohibitions (16 U.S.C. 1538(a)(1)(B)) apply to species listed as endangered. In the case of threatened species, ESA Section 4(d) leaves it to the Secretary's discretion whether and to what extent to promulgate protective regulations. Section 4(d) of the ESA states that ''[w]henever a species is listed as a threatened species * * *, the Secretary shall issue such regulations *as he deems necessary and advisable* to provide for the conservation of such species' [emphasis added]. ''The Secretary may * * * prohibit with respect to any threatened species any act prohibited under section 9(a)(1) * * * with respect to endangered species.'' This gives the Secretary flexibility under section 4(d) to tailor protective regulations that appropriately reflect the biological condition of each threatened ESU and the intended role of listed hatchery fish.

We find that it is necessary and advisable for conservation of the ESUs to prohibit take only of natural-origin fish and hatchery fish with the adipose fin left intact. The majority of hatchery programs produce fish for harvest rather than for conservation. Protecting those fish intended for harvest is not necessary for the conservation of the ESU. To the contrary, if too many hatchery fish are allowed to spawn naturally, it may pose ecological and genetic risks to the natural populations in the ESU. Removal of some hatchery fish before they are allowed to spawn may thus be necessary for the conservation of some ESUs. This concern is discussed in more detail in the final Hatchery Listing Policy elsewhere in this edition of the **Federal Register**.

Hatchery production that is surplus to conservation needs may thus create population pressures that cannot be relieved except through harvest of the surplus. An alternative approach to conservation would be to simply produce fewer hatchery fish. While reducing hatchery production might be another option for addressing this threat, the hatchery production itself is in many cases important for redressing lost treaty harvest opportunities (as well as meeting other societal values). Allowing the continued production of hatchery fish for harvest, and not prohibiting the take of listed marked hatchery fish, balances the conservation needs of listed ESUs against other Federal obligations.

Issue 9: Several commenters were concerned that excluding threatened hatchery fish with a clipped adipose fin (hereafter, ''ad-clipped'') from 4(d) protections would be perceived by managers as strong pressure to expand the use of mark-selective fisheries. (A ''mark-selective'' fishery is one in which anglers can retain only ad-clipped hatchery fish, while any unmarked fish that are caught must be released. Mark-selective fisheries are intended to protect the weaker stock(s) in a mixed-stock fishery, while allowing for harvest opportunities on stronger stocks. Mass-marking by clipping the adipose fins of hatchery fish that are intended for harvest is used to provide an easily distinguished visual cue for anglers). Some of these commenters suggested an alternative would be to prohibit the take of ''naturally spawned fish,'' and fish from specified conservation hatcheries.

Commenters also noted that many ad-clipped hatchery fish are released from conservation programs for recovery purposes and thus merit take prohibitions. The commenters were concerned that the proposed 4(d) protective regulations would require conservation hatchery managers to release hatchery fish with their adipose fins intact so that the take prohibitions would apply. The commenters argued that this would force hatchery managers to use alternative marking methods that are more expensive, more difficult to implement, and less effective.

Response: The amended prohibitions do not mandate that listed hatchery fish be ad-clipped, nor do they mandate the use of mark-selective fisheries. State and tribal hatchery and fishery managers use an array of management tools depending on the needs of individual salmonid populations and resource use objectives. Among these tools are mass marking and mark-selective fisheries. Although the amended protective regulations do not require it, ad-clipping may be the best strategy to achieve their goals for some hatchery programs. These ad-clipped hatchery fish can be harvested in fisheries that have appropriate ESA authorization, including, but not limited to, mark-selective fisheries. However, the amended 4(d) protective regulations do not mandate any particular management strategy provided the strategy is consistent with the conservation and recovery objectives of listed ESUs. An alternative approach would have been to prohibit the take of naturally spawned fish and fish from specific conservation hatcheries. We have instead chosen to rely on the adipose-fin clip because it provides a readily identifiable and enforceable feature for distinguishing those fish protected by the ESA take prohibitions.

The commenters are correct that hatchery fish intended for conservation purposes will not be afforded ESA protection against take if they are released with a clipped adipose fin. Managers of conservation hatchery programs may choose to use alternative marking methods to assist research and monitoring efforts such that the take prohibitions apply to the fish they produce. We acknowledge that the prospect of listing more than 130 West Coast hatchery programs presents challenges to hatchery and fishery management in California, Oregon, Washington, and Idaho. We believe that exempting ad-clipped fish from the take prohibitions is the preferable regulatory option, as compared to the alternative of prohibiting take of all listed hatchery fish. Allowing for the take of listed ad-clipped hatchery fish provides a clearly enforceable distinction for when take prohibitions apply, and provides additional flexibility to more effectively manage fisheries, control the number and proportion of hatchery fish spawning in the wild, and minimize potentially adverse impacts of hatchery fish on natural populations. Although the proposed approach provides management flexibility, we recognize that it may present some challenges. We will continue to work with state and tribal managers to address any challenges in a way that minimizes adverse impacts on affected parties, while achieving conservation and resource use objectives for listed ESUs.

Issue 10: A few commenters felt that NMFS should extend the ''grace period'' for applications for coverage under the 4(d) limits to: Apply to applications for all limits rather than just for scientific research and enhancement activities; allow for more than 60 days to submit an application; and allow for more than 6 months to obtain approval under a 4(d) limit. The commenters felt sufficient time must be allowed for entities to prepare and process applications for 4(d) coverage. The commenters were concerned that NMFS does not have the necessary resources to process applications and issue authorizations within 6 months, given the likely high volume of new 4(d) applications and the significant administrative burden associated with processing and authorizing 4(d) applications. The commenters stressed that any delays in issuing authorizations under 4(d) would disrupt important fisheries and would also risk impeding progress on important recovery efforts.

Response: We are concerned about the potential for disruption of ongoing scientific research, monitoring, and conservation activities, especially during the coming summer/fall field seasons. Consistent with the previously promulgated 4(d) protective regulations, the amended regulations finalized in this notice include a ''temporary'' limit or 6-month grace period for ongoing scientific research and enhancement activities provided a permit application is received by NMFS within 60 days of this notice (see **DATES**, above). Applicants will be subject to the take prohibitions if their permit application is denied, rejected as insufficient, or the 6-month grace period expires, whichever occurs earliest.

We do not feel that a similar 6-month grace period is warranted for limits addressing other activities affecting threatened ESUs. In this notice we are amending existing 4(d) protective regulations for threatened ESUs that are already listed under the ESA (except for the Lower Columbia River coho ESU, which is a new threatened listing). Thus, activities affecting the subject ESUs already have ESA coverage through the existing 4(d) protective regulations, through section 10 permits, as a result of section 7 consultation, or are in the process of obtaining such authorization. The amended 4(d) protective regulations will become effective within 60 days of the publication of this notice (see **DATES**, above). We believe that the grace period allows sufficient time to amend existing ESA authorizations consistent with the revised 4(d) protective regulations. Some activities will not need ESA coverage immediately after the amended protective regulations go into effect because the actions do not affect listed species. We will work with regional co-managers to prioritize activities and programs on the basis of how urgently each needs ESA coverage.

We have anticipated that processing new 4(d) applications submitted in response to the amended 4(d) protective regulations will increase agency workload. As a result, we are evaluating our resource needs and are fully committed to meeting future program demands. We encourage entities to work together in developing plans for 4(d) approval that cover wide geographic scales and multiple activities, thus reducing the number of individual programs that need to be reviewed. While enforcement may be initiated against activities that take protected salmonids, our clear preference is to work with persons or entities to promptly shape their programs and activities to include credible and reliable conservation measures for listed salmon and *O. mykiss* ESUs.

Issue 11: Two Federal agencies (the Bureau of Land Management (BLM), and the U.S. Forest Service (FS)) requested that we amend the limits concerning land management activities on state, private, and tribal lands to include activities on Federal lands that implement regional Land Resource Management Plans (LRMPs) and aquatic conservation strategies. The BLM and FS recognized that including Federal lands in these limits on the take prohibitions would not eliminate their requirement to consult under section 7 of the ESA. However, BLM and FS felt that extending these limits to Federal lands would make the section 7 consultation process more efficient, and minimize or eliminate the need to develop and implement reasonable and prudent measures, as well as mandatory terms and conditions for actions covered under a section 7 Incidental Take Statement.

Response: It is not possible to extend existing 4(d) limits to cover Federal activities implemented under FS and BLM LRMPs because the existing limits address land management activities conducted under differing regulatory authorities and relationships. If we were to adopt a new 4(d) limit covering the LRMPs, it would require review and approval of specific activities, similar to the current 4(d) limits. The LRMPs address general classes of FS and BLM actions, and lack the specificity required for a 4(d) limit. For a 4(d) limit to cover future unidentified actions, without subsequent review and approval, the limit would have to specify narrowly defined activities to be conducted according to strict guidelines within stringent project management conditions. Adopting limits that require subsequent review and approval would not provide any relief to Federal agencies and would, to the contrary, increase regulatory review.

As the BLM and FS acknowledged, the 4(d) limits on the take prohibitions do not relieve Federal agencies of their duty under section 7 of the ESA to consult with NMFS if actions they fund, authorize, or carry out may affect listed species. The various 4(d) limits may be useful to Federal agencies as guidance in developing and implementing their conservation programs. To the extent that Federal actions subject to section 7 consultation are consistent with the terms of a 4(d) limit, the consultation process may be greatly simplified. However, granting BLM's and FS'' request to explicitly include certain Federal activities in several 4(d) limits would not diminish their section 7 obligations.

Comments on ESU-Specific Issues

Issue 12: We received many helpful ESU-specific comments of an editorial nature. These comments noted inadvertent errors in the proposed listing determinations and offered non-substantive but nonetheless clarifying changes to wording.

Response: We have incorporated these editorial-type comments in the ESU definitions, descriptions of ESU status, and the final listing determinations. As these comments do not result in substantive changes to this final rule, we have not detailed the changes made.

Sacramento River Winter-Run Chinook ESU

Issue 13: Several commenters contended that our proposal to reclassify the endangered Sacramento River winter-run Chinook ESU as threatened was not justified because the BRT concluded it was at a high risk of extinction and we overstated the benefits of protective efforts such as the Battle Creek restoration project. They argued that this program in particular was uncertain to be fully implemented, funded, or successful in establishing a second population of this ESU in Battle Creek. In addition, they argued that 2004 changes in the Central Valley Project operations criteria (CVP–OCAP) provided less protection for this ESU than did the previous water project operational criteria.

Response: We acknowledge the BRT concluded this ESU still continues to be at a high risk of extinction, primarily because of concerns about the spatial structure (the ESU is represented by a single population) and the loss of diversity. As indicated in the proposed rule, however, we believe that many important protective efforts have been implemented over the past 10 to 15 years that have contributed to the increased abundance and productivity of this ESU in recent years, as have favorable ocean conditions. These protective efforts include changes in the operation of the Central Valley and State Water Projects, implementation of many CALFED Bay-Delta Program (CALFED) and other habitat restoration projects (*e.g.*, screening of water diversions), changes in ocean and freshwater harvest management, and successful implementation of the hatchery supplementation program at Livingston Stone National Fish Hatchery (NFH). We agree with commenters, however, that the Battle Creek restoration project, which was cited in the proposed rule to support the proposed reclassification,

has not been fully implemented and that its funding and future success are uncertain at this time.

We disagree, however, that the 2004 CVP–OCAP provides less protection to this ESU than previous water project operations criteria. The new CVP–OCAP continues to provide adequate control of temperatures for spawning in the upper Sacramento River despite changes in the temperature control point and carryover storage requirements. We fully analyzed the new CVP–OCAP operations in a biological opinion issued in 2004 and concluded that these operational changes would not jeopardize the continued existence of this ESU.

In light of the concerns raised about the adequacy and benefits of protective efforts for this ESU, particularly the Battle Creek restoration project, we are withdrawing our proposal to reclassify this ESU as threatened. We conclude that the Sacramento River winter-run Chinook ESU continues to warrant listing as an endangered species. We will continue to monitor the status of this ESU and the implementation of protective efforts throughout the California Central Valley. We may reconsider reclassification of the ESU's listing status in the future as these protective efforts mature (the Battle Creek restoration project in particular) and are fully implemented, and their certainty of effectiveness can be more fully assessed.

Central Valley Spring-Run Chinook

Issue 14: Several commenters questioned whether naturally spawning spring-run Chinook in the Feather River should be included in the listed ESU given that they are genetically similar to the Feather River Hatchery stock which was not proposed as part of the Central Valley spring-run Chinook ESU.

Response: We agree with the commenters that naturally spawning spring-run Chinook in the Feather River are genetically similar to the Feather River Hatchery spring-run Chinook stock. Although the hatchery stock shows evidence of introgression with Central Valley fall-run Chinook and is divergent from other within-ESU naturally spawning populations in Deer, Mill and Butte Creeks, both the Feather River naturally spawning population and the Feather River Hatchery spring-run Chinook stock continue to exhibit a distinct early-returning spring-run phenotype. NMFS' SSHAG report (NMFS, 2003a) found that if it was determined that the naturally spawning spring-run Chinook population in the Feather River was part of the ESU, then the Feather River Hatchery spring-run Chinook stock might also be considered part of the ESU. NMFS' Central Valley Technical Recovery Team believes that this early run timing in the Feather River represents the evolutionary legacy of the spring-run Chinook populations that once spawned above Oroville Dam, and that the extant population in the Feather River may be the only remaining representative of this important ESU component (NMFS, 2004d). The Feather River Hatchery spring-run Chinook stock may play an important role in the recovery of spring-run Chinook in the Feather River Basin as efforts progress to restore natural spring-run populations in the Feather and Yuba Rivers. The California Department of Fish and Game (CDFG) has recently initiated marking of all early returning fish to the Feather River Hatchery, and is incorporating only those early-run fish into the Feather River Hatchery spring-run Chinook stock. The California Department of Water Resources also plans to construct a weir to create geographic isolation for spring-run Chinook in the Feather River. These efforts are intended to reduce introgression by Central Valley fall-run Chinook, thereby further isolating and preserving this important early-returning spring-run Chinook phenotype in the Feather River. Recent results indicate that a small percentage of these marked early-run hatchery fish (*i.e.*, those that do not return to the hatchery or are not harvested) are spawning naturally in the Feather River. Based on a consideration of this information, we have determined that: (1) The naturally spawning population of spring-run Chinook in the Feather River represents the level of reproductive isolation and the evolutionary legacy of the ESU, and thus warrants inclusion in the ESU; and (2) the Feather River Hatchery spring-run Chinook stock is no more divergent relative to this local natural population than would be expected between two closely related populations in the ESU, and thus it also warrants inclusion in the ESU. Accordingly, we have revised the ESU definition of the Central Valley spring-run Chinook ESU in this final rule to include the natural population of spring-run Chinook in the Feather River as well as the Feather River Hatchery spring-run Chinook stock (see the ''Determination of 'Species' under the ESA'' section, below).

Upper Willamette River Chinook ESU

Issue 15: The Oregon Department of Fish and Wildlife (ODFW) felt that the Clackamas Hatchery spring-run Chinook program (ODFW stock #19), which was proposed for inclusion in the Upper Willamette River Chinook ESU, should not be included as part of the ESU. ODFW contended that the Clackamas Hatchery should be excluded from the ESU because the program consists of a long-term domesticated broodstock founded from a mix of non-local (but within ESU) populations, and the program is managed for isolation between the hatchery stock and the local natural populations.

Response: The Clackamas spring Chinook broodstock (ODFW stock #19) was initiated in 1976 and is the most recently founded broodstock in the entire ESU. Since hatchery fish released from this program were not all externally marked until 1997, it is unknown how many natural-origin fish have been incorporated into the broodstock since the program was initiated. However, based on the number of natural-origin fish that have entered the hatchery over the last 3 years since all hatchery returns have been marked, it is likely some natural-origin fish have been incorporated regularly into the broodstock since it was established. When this hatchery program began, naturally-produced spring Chinook numbered in the hundreds. It is likely that the subsequent increases in the number of natural-origin Clackamas spring-run Chinook includes the progeny of naturally spawning hatchery-origin fish from the Clackamas Hatchery. Based on this information, the Clackamas Hatchery stock is likely no more divergent from the local natural population than are closely related natural populations in the ESU, and thus it is appropriate for this hatchery stock to be included as part of the Upper Willamette River Chinook ESU.

Lower Columbia River Chinook ESU

Issue 16: ODFW felt that the Big Creek tule (Big Creek, OR) fall-run Chinook hatchery program, which was proposed for inclusion in the Lower Columbia River Chinook ESU, should not be included in the ESU. ODFW contended that the Big Creek tule Chinook program is substantially diverged from the local natural populations in the ESU because it has incorporated non-local (but within ESU) fish in the hatchery broodstock, and the program is unable to actively collect and incorporate natural-origin fish into the broodstock because returning hatchery-origin fish are unmarked and indistinguishable from returning natural-origin fish.

Response: We respectfully disagree with ODFW's contention that the Big Creek Tule fall-run Chinook hatchery program should be excluded from the Lower Columbia River Chinook ESU. The Big Creek Hatchery program has

been releasing hatchery tule fall-run Chinook into Big Creek since 1941 and has incorporated non-local (but within-ESU) hatchery and naturally produced fall-run Chinook into the hatchery broodstock. The program is currently using only hatchery-origin and natural-origin fish returning to Big Creek Hatchery. The level of natural-origin tule fall-run Chinook that are used in the broodstock is unknown due to the low marking rate of hatchery fall-run Chinook released from the facility. However, natural production within this population has been swamped by a high proportion of naturally spawning hatchery-origin fish, and available spawning habitat is constrained by the weir at the hatchery. Consequently, the distinction between the natural-origin and hatchery-origin fall Chinook is minimal. Presently, Big Creek Hatchery fall Chinook are probably not distinguishable from the existing natural population, and thus it is appropriate for this hatchery stock to be included as part of the ESU.

Puget Sound Chinook ESU

Issue 17: Two commenters felt that the Issaquah Creek (Cedar River, Washington), George Adams and Rick's Pond (Skokomish River, Washington), and Hamma Hamma (Westside Hood Canal, Washington) hatchery fall-run Chinook programs, which were not proposed for inclusion in the Puget Sound Chinook ESU, should be included and listed as part of the ESU. The commenters contended that recent genetic analyses (Spidle and Currens, 2005; Marshall, 2000a, 2000b), the broodstock source for the hatchery programs, and their spawning migration timing supported their inclusion in the ESU.

Response: The commenters reach different conclusions regarding the ESU membership of the subject hatchery programs largely because they evaluated their level of divergence relative to different reference natural populations than we did in the proposed listing determination for the Puget Sound Chinook ESU. After reviewing the comments received, other recently available scientific information, and the guidance provided in the final Hatchery Listing Policy, we agree with the commenters that the Issaquah Creek, George Adams, Rick's Pond, and Hamma Hamma fall-run Chinook hatchery programs should be included and listed as part of the ESU. Accordingly we have revised the defined ESU (see the ''Determination of 'Species' under the ESA'' section below) in this final listing determination. In the following paragraphs we provide a brief summary of the information considered in making this change from the proposed listing determination.

Each of the four hatchery programs addressed by the commenters presents a unique challenge in determining what the appropriate ''local natural population'' is for evaluating the level of genetic divergence exhibited by a hatchery program and for determining its ESU membership. These four hatchery programs produce hatchery stocks that are non-indigenous to the local area, but were derived from hatchery stocks founded elsewhere in the Puget Sound Chinook ESU (principally from the Green River hatchery stock lineage). If any existed, the historically native natural populations in the areas where these hatchery programs release their production have been extirpated and replaced by the introduced hatchery stocks (Ruckelshaus *et al.*, in press). Available genetic and tagging information indicates that the existing natural populations are derived from the introduced hatchery stocks and do not represent the historically present local populations. In evaluating the level of divergence exhibited by such a hatchery stock one might compare it to: (1) What is believed to have been the historically native natural population; (2) the out-of-basin natural population from which the hatchery stock was derived; or (3) the existing natural population in the local area that is largely, if not completely, derived from naturally spawning introduced hatchery fish. The commenters argue that the existing local natural population is the appropriate benchmark against which to evaluate a hatchery program's level of divergence. In developing the proposed ESU delineations, however, we evaluated hatchery programs relative to the natural populations from which they were founded, and considered several factors in determining their level of divergence (such as the incorporation of natural-origin fish into the hatchery broodstock, rearing and release practices, whether hatchery fish exhibit locally adaptive life-history traits reflective of the natural population, etc.).

The final Hatchery Listing Policy states that ''hatchery stocks with a level of genetic divergence relative to the *local natural population(s)* that is no more than what would be expected between closely related natural populations within the ESU * * * are considered part of the ESU'' [emphasis added]. In the proposed ESU delineation for the Puget Sound Chinook ESU we concluded that the Issaquah Creek, George Adams, Rick's Pond, and Hamma Hamma fall-run Chinook hatchery programs should not be included due to their non-indigenous origin, and their likely substantial divergence from the founding natural population and hatchery lineage. These programs are intended to produce fish for harvest in an isolated setting, and have not been designed or managed with the intention of seeding the local watersheds with hatchery fish that ecologically and genetically represent natural Chinook (WDFW, 2003a). Despite the intent of these programs, the existing natural populations are likely the progeny of naturally spawning hatchery fish from these non-local programs. Available information indicates that these four hatchery programs are no more diverged from the (existing) local natural populations than what would be expected between closely related natural populations within the ESU, and thus we conclude that they are part of the ESU.

In the proposed ESU determination for the Puget Sound Chinook ESU, we proposed excluding the Hoodsport fall-Chinook hatchery program from the ESU. Our conclusion, similar to the four hatchery programs discussed above, was based on an evaluation of divergence of the Hoodsport hatchery program relative to the stock from which it was derived. Upon re-evaluation consistent with the revised findings for the Issaquah Creek, George Adams, Rick's Pond, and Hamma Hamma hatchery programs, we conclude that the Hoodsport Hatchery program is not part of the ESU. Finch Creek, where the Hoodsport Hatchery program is located, historically and currently lacks an extant local natural Chinook salmon population.

Southern Oregon/Northern California Coast Coho ESU

Issue 18: One commenter disagreed with the proposed determination that the Southern Oregon/Northern California Coast coho ESU is threatened. The commenter asserted that the available data are inadequate to rigorously assess the risk of extinction of the ESU. The commenter further argued that the available data show increasing abundance in the ESU, and do not indicate that Southern Oregon/Northern California Coast coho salmon are likely to become endangered in the foreseeable future throughout all or a significant potion of its range. In addition, the commenter felt that the State of California's coho salmon recovery plan provides sufficient protections to remove the threat that the ESU will become endangered.

Response: We respectfully disagree with the commenter's conclusion that

the Southern Oregon/Northern California Coast coho ESU does not warrant listing. The commenter is correct that there are few data available for naturally spawned populations in the ESU, particularly for the portion of the ESU in California. (The Rogue River population in Oregon is the notable exception, providing the only robust time series of natural-origin abundance in the ESU.) The BRT's status review update report and our proposed threatened determination for this ESU acknowledged this paucity of data for populations in California. However, the ESA requires that we make listing determinations ''solely on the basis of the best scientific and commercial data *available* * * *'' [emphasis added] (ESA section 4(b)(1)(A)). The BRT evaluated all available indices of spawner abundance, and historical and current distribution. The strong majority of the BRT concluded that the ESU is ''likely to become endangered in the foreseeable future.'' The recent increases in ESU abundance noted by the commenter were fully considered by the BRT and in the proposed listing determination. The BRT was encouraged by indications of strong returns in 2001 for several California populations and an apparent increase in the distribution of coho in historically occupied streams. However, the BRT cautioned that the recent increase in abundance and distribution, presumably due to a combination of favorable freshwater and marine conditions, must be evaluated in the context of more than a decade of poor ESU performance, remaining concerns regarding the high level of hatchery production in the ESU, and the loss of local populations in several river systems.

In developing the proposed threatened listing determination for the Southern Oregon/Northern California Coast coho ESU, we considered the potential contributions of many conservation measures, including California's 2003 State listing of coho, and its subsequent efforts in developing and implementing a comprehensive recovery plan for coho in the State (69 FR at 33148; June 14, 2004). We concluded that if ''successfully implemented the State recovery plan will provide substantial benefits to both the Central California Coast and Southern Oregon/Northern California Coast coho ESUs, however, the long-term prospects for plan funding and implementation are uncertain.'' Although a wide range of important protective efforts have been implemented in both Oregon and California, these protective efforts, as yet, do not sufficiently reduce threats to the ESU. Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the conclusion that the Southern Oregon/Northern California Coast coho ESU is threatened.

Lower Columbia River Coho ESU

Issue 19: The Washington Department of Fish and Wildlife (WDFW) argued that the Kalama River Type-N and Type-S hatchery coho programs, which were not proposed for inclusion in the Lower Columbia River coho ESU, should be considered part of the ESU. WDFW acknowledged that the number of local natural-origin fish incorporated in the broodstock for these hatcheries is unknown prior to 1998, and for the Kalama River Type-N hatchery program, non-local sources of broodstock have been used when there were insufficient returns of local fish to meet the program's broodstock needs. However, WDFW noted that adults returning to the Kalama Basin are given priority for incorporation into the hatchery broodstock, and for the Kalama River Type-S hatchery these fish have been sufficient to meet the broodstock needs of the program. In 2004 WDFW proposed integrating the maximum possible level of natural-origin fish into the respective broodstocks for these programs.

WDFW also noted that the Washougal Type-N hatchery coho program was evaluated in NMFS' Salmonid Hatchery Inventory and Effects Evaluation Report (NMFS, 2004b) and recommended for inclusion in the ESU, but apparently was inadvertently omitted from the proposed listing determination. WDFW recommended that the Washougal Type-N hatchery coho program be included as part of the Lower Columbia River coho ESU.

ODFW opposed the inclusion of Oregon hatchery coho programs in the Lower Columbia River coho ESU. ODFW argued that the Big Creek Hatchery (ODFW stock # 13), Sandy Hatchery (ODFW stock # 11), Bonneville/Cascade/Oxbow Complex (ODFW stock # 14), and Eagle Creek NFH (ODFW stock # 19) broodstocks propagated at the Oregon hatchery facilities should not be regarded as part of the ESU as all are long-term domesticated broodstocks, all have incorporated various levels of out-of-basin (but within ESU) stocks, and all are managed for isolation between the hatchery stocks and any local natural coho populations. For these reasons ODFW recommended excluding the following Oregon hatchery coho programs from the Lower Columbia River coho ESU: Big Creek Hatchery (Big Creek, Oregon), Astoria High School STEP (Youngs Bay, Oregon), Warrenton High School STEP (Youngs Bay, Oregon), CEDC Coho Salmon Program (Youngs Bay, Oregon), Sandy Hatchery (Sandy River, Oregon), and the Bonneville/Cascade/Oxbow Complex (Lower Columbia River Gorge, Oregon) hatchery coho programs. ODFW also noted that the Eagle Creek NFH (Clackamas River, Oregon) coho hatchery program was apparently inadvertently omitted from the proposed listing determination.

Response: The commenters are correct that the Washougal Type-N and Eagle Creek NFH hatchery coho programs were inadvertently omitted from the proposed listing determinations. We have fixed that oversight by including these two programs as part of the Lower Columbia River coho ESU in the final listing determination (see ''Determination of Species under the ESA'' section, below).

We concur with WDFW that the Kalama River Type-N and Type-S hatchery coho programs should be included within the ESU (see ''Determination of Species under the ESA'' section, below). Although it is unknown if these programs represent the populations that were historically present, they do represent the current populations within the basin. Both Type-N and Type-S coho were historically present in the Kalama River but not in great abundance, with habitat limited to the area below Kalama Falls. Both natural and hatchery-origin Type-N and Type-S coho salmon were used in the broodstocks prior to 1998. Subsequently all hatchery production has been marked, and broodstocks were limited to only hatchery-origin coho from 1998 to 2004. In 2004, WDFW proposed to begin incorporating natural-origin coho into the broodstocks. The incorporation of Type-N coho salmon released into the Kalama River from other basins has occurred in recent years, though the origin of the Type-N coho is representative of the Type-N coho within the ESU. With implementation of WDFW's proposal to incorporate natural-origin coho salmon into the broodstock, the hatchery stock will become even more similar to the extant natural populations. The Type-S program has been self-sustaining (*i.e.*, it has not had to incorporate fish from other basins) since 1992.

We disagree with ODFW that the Big Creek Hatchery, Astoria High School STEP, Warrenton High School STEP, Sandy Hatchery, and the Bonneville/Cascade/Oxbow Complex hatchery coho programs should be excluded from the

Lower Columbia River coho ESU. We acknowledge that these programs have incorporated within-ESU hatchery coho from outside the local historical population(s) and that the hatcheries have been managed as isolated programs. However, these programs originated from within-ESU natural coho stocks and incorporated local natural-origin coho into the broodstock until the late 1990s (when the practice of mass marking hatchery coho was implemented and only marked hatchery-origin fish were incorporated into the broodstock). The Sandy Hatchery program has been the exception, having been developed from only Sandy River natural coho salmon with limited introductions from non-local ESU populations (the last of which occurred in 1952). Within the populations where these hatchery coho programs release their production, returning hatchery-origin adults contribute substantially to natural spawning. As described in the Salmonid Hatchery Inventory and Effects Evaluation Report (NMFS, 2004b; 2005b) and by the BRT (NMFS, 2003b) all of these hatchery programs represent the existing local spawning populations, and they also represent a large proportion of the remaining genetic material for many of the smaller tributaries within the ESU.

Issue 20: Several commenters were opposed to the proposed listing of the Lower Columbia River coho ESU. WDFW and ODFW suggested that conservation measures for coho and other salmonids in the Lower Columbia region, if evaluated pursuant to PECE, might substantially mitigate risks to the Lower Columbia River coho ESU such that it would not warrant ESA listing. In particular, the commenters highlighted the beneficial contributions of: (1) The Lower Columbia Fish Recovery Board's (LCFRB) recovery plan for salmonids in the Lower Columbia region; (2) the 1999 listing of Lower Columbia River coho as an ''endangered'' species on the State of Oregon's Endangered Species List; and (3) the recovery plan for Lower Columbia River coho developed and adopted by the Oregon Fish and Wildlife Commission in 2001, which specifies State conservation measures with respect to harvest, hatchery operations, fish passage, and habitat restoration necessary to achieve recovery goals.

Response: We respectfully disagree with the suggestion that conservation measures under the LCFRB and Oregon recovery plans substantially reduce risks to the ESU to the point that Lower Columbia River coho are not in danger of extinction or likely to become endangered in the foreseeable future. Of an estimated 23 historical populations in the ESU, there are only two extant populations in the Sandy and Clackamas Rivers, and approximately 40 percent of historical habitat is currently inaccessible. Of the extant populations, the total recent mean abundance is less than 1,500 naturally spawning adults, posing significant risks due to depensatory and stochastic demographic processes. The BRT found extremely high levels of risk to the ESU's abundance, productivity, spatial structure, and diversity, and the majority concluded that the ESU is ''in danger of extinction.'' In proposing Lower Columbia River coho as threatened, we concluded that the genetic reserve represented by the 21 hatchery programs within this ESU mitigated the immediacy of extinction risk in the short term. However, we cautioned that long-term reliance on the continued operation of these hatchery programs is inherently risky.

The commenters suggest that the LCFRB recovery plan and Oregon's Lower Columbia River coho recovery plan satisfy the criteria under PECE for certainty of implementation and effectiveness. PECE requires that conservation efforts provide such certainty at the time of a listing determination, and although we are very supportive of these recovery planning efforts, we feel that these efforts lack this certainty. For example, while the LCFRB and Oregon coho recovery plans lay out actions that, if implemented, would address threats to Lower Columbia River coho, all the laws and regulations necessary to implement those actions are not yet in place, nor is there a high level of certainty that the actions will be funded. Similarly, while the plans identify the nature and extent of threats to Lower Columbia River coho, they do not as yet address the full suite of PECE criteria for certainty of effectiveness (such as establishing quantifiable performance measures for monitoring compliance and effectiveness, and employing adaptive management). While we expect that as the plans evolve these elements will be developed, our listing determination must be based on whether the plans are *currently* certain to improve the status of the species.

As noted in PECE, ''there are circumstances in which the threats to a species are so imminent and/or complex that it will be almost impossible to develop an agreement or plan that includes conservation efforts that will result in making the listing unnecessary'' (68 FR at 15101; March 28, 2003). We are concerned that the severity of the demographic risks facing the two extant natural populations in the ESU makes it extremely unlikely that any conservation program or suite of programs could sufficiently mitigate extinction risk such that the ESU would not warrant listing.

Issue 21: In their comments on the proposed threatened determination for the Lower Columbia River coho ESU, ODFW noted that it was unclear whether the defined ESU includes naturally produced coho in the Willamette River Basin upstream of Willamette Falls (Oregon City, Oregon). ODFW noted that an apparently robust and self-sustaining population of coho has been established above the falls as a result of introductions of Lower Columbia River hatchery coho. These hatchery releases have been stopped, and the coho returning above the falls are naturally produced. ODFW recommended against including the coho population above Willamette Falls in the Lower Columbia River coho ESU because they occur outside of the native range of coho, and may pose a potential threat to native Upper Willamette spring-run Chinook and winter steelhead listed as threatened.

Response: The historical upstream extent of coho in the Willamette River Basin was Willamette Falls. Coho salmon returning to spawn in fall during low-flow conditions were unable to pass above the falls (only species with early spring migration timing during higher flow conditions, spring-run Chinook and winter steelhead, were historically able to pass above Willamette Falls (Myers *et al.*, 2001)). However, as early as 1885, fish ladders were constructed at the falls to aid the passage of anadromous fish in low flow conditions. The ladders have subsequently been modified and rebuilt, as recently as 1971 and 1975 (Bennett, 1987; PGE, 1994).

Although the coho population in the Upper Willamette River Basin is outside of the historical geographic range of the Lower Columbia River coho ESU, the question remains whether this population satisfies the criteria for inclusion in the ESU: (1) It is not substantially reproductively isolated from the ESU; and (2) it reflects the ESU's evolutionary legacy. The technical paper describing the ESU concept (Waples, 1991) notes that an introduced population outside of the historic range of the species may be considered part of an ESU if it supports natural production in areas that are ecologically similar to and geographically near the source natural population(s). The Upper Willamette River Basin is ecologically complex and

arguably shares ecological features with extant and historical coho populations in the Lower Columbia River coho ESU. However, it is worth noting that all of the anadromous salmonid species that historically spawned in the Upper Willamette River (*O. mykiss,* cutthroat trout, spring-run Chinook) are delineated into separate ESUs from lower Columbia River populations of the same species. The delineation of separate Upper Willamette River ESUs is based in part on historic genetic differences reflecting reproductive isolation, but also because of distinct ecological features.

We are uncertain whether the Upper Willamette River coho population is representative of the genetic lineage of the Lower Columbia River coho ESU. Introductions of coho into the Upper Willamette River Basin began on a regular basis in 1952 (Williams, 1983). Coho salmon (at various life-history stages) were released in the Willamette River and 17 major tributaries above Willamette Falls from thirteen different hatchery programs. The predominant hatchery stock released was from the Bonneville/Cascade/Oxbow Complex (considered within the ESU); however, several out-of-ESU hatchery stocks from the northern Oregon Coast were also introduced at several locations through the early 1970s. There is insufficient information to determine if this introduced coho population reflects the level of reproductive isolation in the Lower Columbia River coho ESU given the mixture of within-ESU and out-of-ESU hatchery stocks used to found the population, and the lack of genetic data to evaluate its level of divergence relative to the extant populations in the Sandy and Clackamas Rivers. Given this uncertainty, we do not feel that there is sufficient information to support including the Upper Willamette River coho population as part of the Lower Columbia River coho ESU at this time. If information becomes available indicating that the Upper Willamette River coho population is not substantially reproductively isolated from the Lower Columbia River coho ESU, we may take such opportunity to review the ESU membership of the introduced population.

Issue 22: Several commenters felt that we lack sufficient site-specific information to justify including co-occurring resident and anadromous *O. mykiss* in the same ESU. The commenters acknowledged that there is general evidence indicating that where the two life-history forms co-occur they interbreed, are genetically and phenotypically indistinguishable, and can produce offspring of the alternate life-history form. However, the commenters felt that we lack the population-specific genetic and behavioral information to extrapolate these observations universally to all populations and ESUs where resident and anadromous *O. mykiss* have overlapping distributions.

The commenters further noted that in the proposed listing determinations resident populations included in *O. mykiss* ESUs were determined to have minor contributions to the viability of the ESUs. (In the proposed listing determinations we concluded that, despite the reduced risk to abundance for certain *O. mykiss* ESUs due to qualitatively abundant rainbow trout populations, the collective contribution of the resident life-history form to the viability of an ESU in-total is unknown and may not substantially reduce an ESU's risk of extinction (NMFS, 2004; 69 FR 33102, June 14, 2004)). The commenters questioned why resident *O. mykiss* populations should be included in an ESU given that they have little, if any, contribution to the viability of the ESU.

Response: We believe that the best available scientific information indicates that: (1) Where resident and anadromous *O. mykiss* co-occur they share a common gene pool, and collectively exhibit the adaptive life-history, ecological, and behavioral traits composing an important component in the evolutionary legacy of the species; and (2) some components of an *O. mykiss* ESU will (on average) have a larger contribution to its viability, while other components will have a comparatively weaker contribution to the ESU's viability, with a persistence that may be dependent upon their connectivity with other more productive components of the ESU. However, we agree that substantial disagreement exists regarding the sufficiency and accuracy of the data. Several efforts are underway that may resolve scientific disagreement regarding the sufficiency and accuracy of data relevant to these ESUs (*i.e.*, the relationship between resident rainbow trout and anadromous steelhead and the contribution of resident rainbow trout to the viability of *O. mykiss* ESUs). We will gather more data and engage further debate among scientific experts before making final determinations regarding these ESUs. A separate notice of 6-month extension of the deadline for making final listing determinations on the *O. mykiss* ESUs appears in today's issue of the **Federal Register**.

Issue 23: In March 2005 the State of Oregon released a draft Oregon Coastal Coho Assessment (draft assessment) of the viability of the Oregon Coast coho ESU, as well as of the contributions of the Oregon Plan for Salmon and Watersheds to conserving the Oregon Coast coho ESU. Oregon's draft assessment concluded that the Oregon Coast coho ESU is viable. We announced in a **Federal Register** notice that we would be considering the information presented by Oregon in determining the final listing status for the ESU, and we solicited public comment on Oregon's draft assessment during a 30-day public comment period (70 FR 6840; February 9, 2005). The comments received by NMFS and Oregon raised a number of concerns regarding the sufficiency and adequacy of the data and analyses used in the draft assessment. On May 6, 2005, Oregon released a final Oregon Coastal Coho Assessment (final assessment) that incorporates and responds to the comments received, and includes several substantive changes intended to address the concerns raised regarding the sufficiency and adequacy of the draft assessment.

Response: We will extend the deadline for the final listing determination for the Oregon Coast coho ESU for 6 months to analyze Oregon's final assessment in light of the comments received on the draft assessment. Additionally, we are soliciting additional information regarding the sufficiency and adequacy of the final assessment. This extension will enable us to make a final listing determination based upon the best available scientific information. A separate notice of 6-month extension of the deadline for making a final listing determination on the Oregon Coast coho ESU appears in this issue of the **Federal Register**.

Summary of Changes From the Proposed Listing Determinations and Proposed Protective Regulations

Based on the comments received, we have made several substantive changes to the proposed ESU definitions and listing determinations, as discussed in the response to comments (above), and detailed below. We do not detail minor changes of an editorial nature (see Response to Issue 12, above).

The listing determination for the Sacramento River winter-run Chinook ESU has been changed from ''threatened'' (as proposed), to ''endangered'' (see Issue 13, above). The ESU is currently listed as an endangered species.

For the Central Valley spring-run Chinook ESU we have included the natural population of spring-run Chinook in the Feather River, as well as

the Feather River Hatchery spring-run Chinook program, in the ESU. The Feather River Hatchery spring-run Chinook program and the associated natural population were not proposed as part of the ESU (see Issue 14, above).

For the Puget Sound Chinook ESU we have included the following hatchery programs as part of the ESU: the Issaquah Creek (Cedar River, Washington), George Adams and Rick's Pond (Skokomish River, Washington), and Hamma Hamma (Westside Hood Canal, Washington) hatchery fall-run Chinook programs. These hatchery programs were not proposed as part of the ESU (see Issue 17, above).

For the Lower Columbia River coho ESU we have included the following programs as part of the ESU: Kalama River Type-N (Washington), Kalama River Type-S (Washington), Washougal River Type-N (Washington), and Eagle Creek NFH (Clackamas River, Oregon) hatchery coho programs. The Eagle Creek NFH and Washougal River Type-N hatchery programs were inadvertently omitted from the proposed listing determination (see Issue 19, above). The Kalama River Type-N and Type-S hatchery coho programs were not proposed as part of the ESU (see Issue 19, above).

Treatment of the Four Listing Determination Steps for Each ESU Under Review

Determination of ''Species'' Under the ESA

To qualify for listing as a threatened or endangered species, a population (or group of populations) of West Coast salmonids must be considered a ''species'' as defined under the ESA. The ESA defines a species to include ''any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature'' (ESA section 3(16)). NMFS published a policy (56 FR 58612; November 20, 1991) describing the agency's application of the ESA definition of ''species'' to anadromous Pacific salmonid species. This policy provides that a Pacific salmonid population (or group of populations) will be considered a DPS, and hence a ''species'' under the ESA, if it represents an ESU of the biological species. An ESU must be reproductively isolated from other conspecific population units, and it must represent an important component in the evolutionary legacy of the biological species. The first criterion, reproductive isolation, need not be absolute, but must be strong enough to permit evolutionarily important differences to accrue in different population units. The second criterion is met if the population unit contributes substantially to the ecological and genetic diversity of the species. Guidance on the application of this policy is contained in 56 FR 58612 (November 20, 1991) and Waples (1991). As noted in the *''Past Pacific Salmonid ESA Listings and the Alsea Decision''* section above, all components included in an ESU (natural populations, hatchery stocks, resident populations, etc.) must be listed if it is determined that the ESU in-total is threatened or endangered under the ESA.

We have reviewed the ESU relationships of hatchery salmon stocks (NMFS, 2003a; 2004b; 2005b). Hatchery stocks are included in an ESU if it is determined that they are not reproductively isolated from populations in the ESU, and they are representative of the evolutionary legacy of the ESU (see the ''Consideration of Artificial Propagation in Listing Determinations'' section above). Hatchery stocks are considered representative of the evolutionary legacy of an ESU, and hence included in the ESU, if it is determined that they are genetically no more than moderately divergent from the natural population (see final Hatchery Listing Policy elsewhere in this edition of the **Federal Register**). If a hatchery stock is more divergent from the local natural population, this indicates that the hatchery stock is reproductively isolated from the ESU.

The hatchery components are detailed below for each ESU, as applicable. More detailed descriptions of the hatchery stocks included in the ESUs below can be found in the revised Salmonid Hatchery Inventory and Effects Evaluation Report (NMFS, 2005b). A given hatchery stock determined to be part of an ESU may be propagated at multiple sites. To more clearly convey the hatchery fish that are included in a given ESU, the ESU descriptions below list the artificial propagation programs that propagate hatchery stocks determined to be part of the 16 ESUs addressed in this final rule. A list of those specific artificial propagation programs by ESU is provided for reference in Table 1 at the end of this section.

Snake River Sockeye ESU—The Snake River sockeye ESU includes populations of anadromous sockeye salmon in the Snake River Basin, Idaho (extant populations occur only in the Stanley Basin) (56 FR 58619; November 20, 1991), residual sockeye salmon in Redfish Lake, Idaho, as well as one captive propagation hatchery program (Table 1). Artificially propagated sockeye salmon from the Redfish Lake Captive Propagation program are considered part of this ESU. We have determined that this artificially propagated stock is no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

Subsequent to the 1991 listing determination for the Snake River sockeye ESU, a ''residual'' form of Snake River sockeye (hereafter ''residuals'') was identified. The residuals often occur together with anadromous sockeye salmon and exhibit similar behavior in the timing and location of spawning. Residuals are thought to be the progeny of anadromous sockeye salmon, but are generally nonanadromous. In 1993 NMFS determined that the residual population of Snake River sockeye that exists in Redfish Lake is substantially reproductively isolated from kokanee (*i.e.*, nonanadromous populations of *O. nerka* that become resident in lake environments over long periods of time), represents an important component in the evolutionary legacy of the biological species, and thus merits inclusion in the Snake River sockeye ESU. Constituents and co-managers were subsequently advised that residual sockeye salmon in Redfish Lake are part of the ESU and are listed as an endangered species ''subject to all the protection, prohibitions, and requirements of the ESA that apply to Snake River sockeye salmon'' (letter from Acting NMFS Director Nancy Foster to Constituents, dated March 19, 1993).

Ozette Lake Sockeye ESU—The Ozette Lake sockeye ESU includes all naturally spawned populations of sockeye salmon in Ozette Lake and streams and tributaries flowing into Ozette Lake, Washington (64 FR 14528; March 25, 1999). Two artificial propagation programs are considered to be part of this ESU (Table 1): The Umbrella Creek and Big River sockeye hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

Sacramento Winter-run Chinook ESU—The Sacramento winter-run Chinook ESU includes all naturally spawned populations of winter-run Chinook salmon in the Sacramento River and its tributaries in California (59 FR 440; January 1, 1994), as well as two

artificial propagation programs (Table 1): Winter-run Chinook from the Livingston Stone National Fish Hatchery (NFH), and winter run Chinook in a captive broodstock program maintained at Livingston Stone NFH and the University of California Bodega Marine Laboratory. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

Central Valley Spring-run Chinook ESU—The Central Valley spring-run Chinook ESU includes all naturally spawned populations of spring-run Chinook salmon in the Sacramento River and its tributaries in California, including the Feather River (64 FR 50394; September 16, 1999). One artificial propagation program is considered part of the ESU (Table 1): The Feather River Hatchery spring run Chinook program (see response to Issue 14 in the ''Summary of Comments and Information Received'' section, above). We have determined that this artificially propagated stock is no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

California Coastal Chinook ESU—The California Coastal Chinook ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River to the Russian River, California (64 FR 50394; September 16, 1999). Seven artificial propagation programs are considered to be part of the ESU (Table 1): The Humboldt Fish Action Council (Freshwater Creek), Yager Creek, Redwood Creek, Hollow Tree, Van Arsdale Fish Station, Mattole Salmon Group, and Mad River Hatchery fall-run Chinook hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

Upper Willamette River Chinook ESU—The Upper Willamette River Chinook ESU includes all naturally spawned populations of spring-run Chinook salmon in the Clackamas River and in the Willamette River, and its tributaries, above Willamette Falls, Oregon (64 FR 14208; March 24, 1999). Seven artificial propagation programs are considered to be part of the ESU (Table 1): The McKenzie River Hatchery (Oregon Department of Fish and Wildlife (ODFW) stock # 24), Marion Forks/North Fork Santiam River (ODFW stock # 21), South Santiam Hatchery (ODFW stock # 23) in the South Fork Santiam River, South Santiam Hatchery (ODFW stock # 23) in the Calapooia River, South Santiam Hatchery (ODFW stock # 23) in the Mollala River, Willamette Hatchery (ODFW stock # 22), and Clackamas hatchery (ODFW stock # 19) spring-run Chinook hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

Lower Columbia River Chinook ESU—The Lower Columbia River Chinook ESU includes all naturally spawned populations of Chinook salmon from the Columbia River and its tributaries from its mouth at the Pacific Ocean upstream to a transitional point between Washington and Oregon east of the Hood River and the White Salmon River, and includes the Willamette River to Willamette Falls, Oregon, exclusive of spring-run Chinook salmon in the Clackamas River (64 FR 14208; March 24, 1999). Seventeen artificial propagation programs are considered to be part of the ESU (Table 1): The Sea Resources Tule Chinook Program, Big Creek Tule Chinook Program, Astoria High School (STEP) Tule Chinook Program, Warrenton High School (STEP) Tule Chinook Program, Elochoman River Tule Chinook Program, Cowlitz Tule Chinook Program, North Fork Toutle Tule Chinook Program, Kalama Tule Chinook Program, Washougal River Tule Chinook Program, Spring Creek NFH Tule Chinook Program, Cowlitz spring Chinook Program in the Upper Cowlitz River and the Cispus River, Friends of the Cowlitz spring Chinook Program, Kalama River spring Chinook Program, Lewis River spring Chinook Program, Fish First spring Chinook Program, and the Sandy River Hatchery (ODFW stock #11) Chinook hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

Upper Columbia River Spring-run Chinook ESU—The Upper Columbia River spring-run Chinook ESU includes all naturally spawned populations of Chinook salmon in all river reaches accessible to Chinook salmon in Columbia River tributaries upstream of the Rock Island Dam and downstream of Chief Joseph Dam in Washington, excluding the Okanogan River (64 FR 14208; March 24, 1999). Six artificial propagation programs are considered to be part of the ESU (Table 1): The Twisp River, Chewuch River, Methow Composite, Winthrop NFH, Chiwawa River, and White River spring-run Chinook hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

Puget Sound Chinook ESU—The Puget Sound Chinook ESU includes all naturally spawned populations of Chinook salmon from rivers and streams flowing into Puget Sound including the Straits of Juan De Fuca from the Elwha River, eastward, including rivers and streams flowing into Hood Canal, South Sound, North Sound and the Strait of Georgia in Washington (64 FR 14208; March 24, 1999). Twenty-six artificial propagation programs are considered to be part of the ESU (Table 1): The Kendal Creek Hatchery, Marblemount Hatchery (fall, spring yearlings, spring subyearlings, and summer run), Harvey Creek Hatchery, Whitehorse Springs Pond, Wallace River Hatchery (yearlings and subyearlings), Tulalip Bay, Issaquah Hatchery, Soos Creek Hatchery, Icy Creek Hatchery, Keta Creek Hatchery, White River Hatchery, White Acclimation Pond, Hupp Springs hatchery, Voights Creek Hatchery, Diru Creek, Clear Creek, Kalama Creek, George Adams Hatchery, Rick's Pond Hatchery, Hamma Hamma Hatchery, Dungeness/Hurd Creek Hatchery, and Elwha Channel Hatchery Chinook hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b; and see Response to Issue 17, above).

Snake River Fall-run Chinook ESU—The Snake River fall-run Chinook ESU includes all naturally spawned populations of fall-run Chinook salmon in the mainstem Snake River below Hells Canyon Dam, and in the Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River subbasins (57 FR 14653, April 22, 1992; 57 FR 23458, June 3, 1992). Four artificial propagation programs are considered to be part of the ESU (Table 1): The Lyons Ferry Hatchery, Fall Chinook Acclimation Ponds Program, Nez Perce Tribal Hatchery, and Oxbow Hatchery fall-run

Chinook hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

Snake River Spring/Summer Chinook ESU—The Snake River spring/summer-run Chinook ESU includes all naturally spawned populations of spring/summer-run Chinook salmon in the mainstem Snake River and the Tucannon River, Grande Ronde River, Imnaha River, and Salmon River subbasins (57 FR 23458; June 3, 1992). Fifteen artificial propagation programs are considered to be part of the ESU (Table 1): The Tucannon River conventional Hatchery, Tucannon River Captive Broodstock Program, Lostine River, Catherine Creek, Lookingglass Hatchery Reintroduction Program (Catherine Creek stock), Upper Grande Ronde, Imnaha River, Big Sheep Creek, McCall Hatchery, Johnson Creek Artificial Propagation Enhancement, Lemhi River Captive Rearing Experiment, Pahsimeroi Hatchery, East Fork Captive Rearing Experiment, West Fork Yankee Fork Captive Rearing Experiment, and the Sawtooth Hatchery spring/summer-run Chinook hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

Central California Coast Coho ESU—The Central California Coast coho ESU includes all naturally spawned populations of coho salmon from Punta Gorda in northern California south to and including the San Lorenzo River in central California, as well as populations in tributaries to San Francisco Bay, excluding the Sacramento-San Joaquin River system (61 FR 56138; October 31, 1996). Four artificial propagation programs are considered part of this ESU (Table 1): The Don Clausen Fish Hatchery Captive Broodstock Program, Scott Creek/King Fisher Flats Conservation Program, Scott Creek Captive Broodstock Program, and the Noyo River Fish Station egg-take Program coho hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

Southern Oregon/Northern California Coast Coho ESU—The Southern Oregon/Northern California Coast coho ESU includes all naturally spawned populations of coho salmon in coastal streams between Cape Blanco, Oregon, and Punta Gorda, California (62 FR 24588; May 6, 1997). Three artificial propagation programs are considered to be part of the ESU (Table 1): The Cole Rivers Hatchery (ODFW stock # 52), Trinity River Hatchery, and Iron Gate Hatchery coho hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

Lower Columbia River Coho ESU—The Lower Columbia River coho ESU includes all naturally spawned populations of coho salmon in the Columbia River and its tributaries from the mouth of the Columbia up to and including the Big White Salmon and Hood Rivers, and includes the Willamette River to Willamette Falls, Oregon. Twenty-five artificial propagation programs are considered to be part of the ESU (Table 1): The Grays River, Sea Resources Hatchery, Peterson Coho Project, Big Creek Hatchery, Astoria High School (STEP) Coho Program, Warrenton High School (STEP) Coho Program, Elochoman Type-S Coho Program, Elochoman Type-N Coho Program, Cathlamet High School FFA Type-N Coho Program, Cowlitz Type-N Coho Program in the Upper and Lower Cowlitz Rivers, Cowlitz Game and Anglers Coho Program, Friends of the Cowlitz Coho Program, North Fork Toutle River Hatchery, Kalama River Type-N Coho Program, Kalama River Type-S Coho Program, Lewis River Type-N Coho Program, Lewis River Type-S Coho Program, Fish First Wild Coho Program, Fish First Type-N Coho Program, Syverson Project Type-N Coho Program, Washougal River Type-N Coho Program, Eagle Creek NFH, Sandy Hatchery, and the Bonneville/Cascade/Oxbow complex coho hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b; see Response to Issue 19, above).

Columbia River Chum ESU—The Columbia River chum ESU includes all naturally spawned populations of chum salmon in the Columbia River and its tributaries in Washington and Oregon (64 FR 14508; March 25, 1999). Three artificial propagation programs are considered to be part of the ESU (Table 1): The Chinook River (Sea Resources Hatchery), Grays River, and Washougal River/Duncan Creek chum hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

Hood Canal Summer-run Chum ESU—The Hood Canal summer-run chum includes all naturally spawned populations of summer-run chum salmon in Hood Canal and its tributaries as well as populations in Olympic Peninsula rivers between Hood Canal and Dungeness Bay, Washington (64 FR 14508; March 25, 1999). Eight artificial propagation programs are considered to be part of the ESU (Table 1): The Quilcene NFH, Hamma Hamma Fish Hatchery, Lilliwaup Creek Fish Hatchery, Union River/Tahuya, Big Beef Creek Fish Hatchery, Salmon Creek Fish Hatchery, Chimacum Creek Fish Hatchery, and the Jimmycomelately Creek Fish Hatchery summer-run chum hatchery programs. We have determined that these artificially propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS, 2005b).

TABLE 1.—LIST OF ARTIFICAL PROPAGATION PROGRAMS INCLUDED IN EVOLUTIONARILY SIGNIFICANT UNITS (ESUS) OF WEST COAST SALMON

Evolutionary significant unit (ESU) and included artificial propagation program(s)	Run timing	Location (state)
Snake River sockeye ESU:		
Redfish Lake Captive Propagation Program	n/a	Stanley Basin (Idaho).
Ozette Lake sockeye ESU:		
Umbrella Creek Hatchery—Makah Tribe	n/a	Ozette Lake (Washington).
Big River Hatchery—Makah Tribe	n/a	Ozette Lake (Washington).

TABLE 1.—LIST OF ARTIFICAL PROPAGATION PROGRAMS INCLUDED IN EVOLUTIONARILY SIGNIFICANT UNITS (ESUS) OF WEST COAST SALMON—Continued

Evolutionary significant unit (ESU) and included artificial propagation program(s)	Run timing	Location (state)
Sacramento River winter-run Chinook ESU:		
Livingston Stone National Fish Hatchery (NFH) Conservation Program	Winter	Sacramento River (California).
Captive Broodstock Program	Winter	Livingston Stone NFH & Univ. of Calif. Bodega Marine Laboratory (California).
Central Valley spring-run Chinook ESU:		
Feather River Hatchery	Spring	Feather River (California).
California Coastal Chinook ESU:		
Freshwater Creek/Humboldt Fish Action Council	Fall	Freshwater Creek, Humboldt Bay (California).
Yager Creek Hatchery	Fall	Yager Creek, Van Duzen River (California).
Redwood Creek Hatchery	Fall	Redwood Creek, South Fork Eel River (California).
Hollow Tree Creek Hatchery	Fall	Eel River (California).
Mattole Salmon Group Hatchery	Fall	Squaw Creek, Mattole River (California).
Van Arsdale Fish Station	Fall	Eel River (California).
Mad River Hatchery	Fall	Mad River (California).
Upper Willamette River Chinook ESU:		
McKenzie River Hatchery (Oregon Department of Fish & Wildlife (ODFW) stock #24).	Spring	McKenzie River (Oregon).
Marion Forks Hatchery (ODFW stock #21)	Spring	North Fork Santiam River (Oregon).
South Santiam Hatchery (ODFW stock #23)	Spring	South Fork Santiam River (Oregon).
South Santiam Hatchery (ODFW stock #23)	Spring	Calapooia River (Oregon).
South Santiam Hatchery (ODFW stock #23)	Spring	Mollala River (Oregon).
Willamette Hatchery (ODFW stock #22)	Spring	Middle Fork Willamette River (Oregon).
Clackamas Hatchery (ODFW stock #19)	Spring	Clackamas River (Oregon).
Lower Columbia River Chinook ESU:		
Sea Resources Tule Chinook Program	Fall	Chinook River (Washington).
Big Creek Tule Chinook Program	Fall	Big Creek (Oregon).
Astoria High School (STEP) Tule Chinook Program	Fall	Big Creek (Oregon).
Warrenton High School (STEP) Tule Chinook Program	Fall	Big Creek (Oregon).
Elochoman River Tule Chinook Program	Fall	Elochoman River (Washington).
Cowlitz Tule Chinook Program	Fall	Lower Cowlitz River (Washington).
North Fork Toutle Tule Chinook Program	Fall	Cowlitz River (Washington).
Kalama Tule Chinook Program	Fall	Kalama River (Washington).
Washougal River Tule Chinook Program	Fall	Washougal River (Washington).
Spring Creek NFH Tule Chinook Program	Fall	Upper Columbia River Gorge (Washington).
Cowlitz spring Chinook Program	Fall	Upper Cowlitz River (Washington).
Cowlitz spring Chinook Program	Spring	Cispus River (Washington).
Friends of Cowlitz spring Chinook Program	Spring	Upper Cowlitz River (Washington).
Kalama River spring Chinook Program	Spring	Kalama River (Washington).
Lewis River spring Chinook Program	Spring	Lewis River (Washington).
Fish First spring Chinook Program	Spring	Lewis River (Washington).
Sandy River Hatchery (ODFW stock #11)	Spring	Sandy River (Oregon).
Upper Columbia River spring Chinook ESU:		
Twisp River	Spring	Methow River (Washington).
Chewuch River	Spring	Methow River (Washington).
Methow Composite	Spring	Methow River (Washington).
Winthrop NFH (Methow Composite stock)	Spring	Methow River (Washington).
Chiwawa River	Spring	Wenatchee River (Washington).
White River	Spring	Wenatchee River (Washington).
Puget Sound Chinook ESU:		
Kendall Creek Hatchery	Spring	North Fork Nooksack River (Washington).
Marblemount Hatchery	Fall	Lower Skagit River (Washington).
Marblemount Hatchery (yearlings)	Spring	Upper Skagit River (Washington).
Marblemount Hatchery (sub-yearlings)	Spring	Upper Skagit River (Washington).
Marblemount Hatchery	Summer	Upper Skagit River (Washington).
Harvey Creek Hatchery	Summer	North Fork Stillaguamish River (Washington).
Whitehorse Springs Pond	Summer	North Fork Stillaguamish River (Washington).
Wallace River Hatchery (yearlings)	Summer	Skykomish River (Washington).
Wallace River Hatchery (sub-yearlings)	Summer	Skykomish River (Washington).
Tulalip Bay (Bernie Kai-Kai Gobin Hatchery/Tulalip Hatchery)	Summer	Skykomish River/Tulalip Bay (Washington).
Issaquah Hatchery	Fall	Cedar River (Washington).
Soos Creek Hatchery	Fall	Green River (Washington).
Icy Creek Hatchery	Fall	Green River (Washington).
Keta Creek—Muckelshoot Tribe	Fall	Green River (Washington).
White River Hatchery	Spring	White River (Washington).
White Acclimation Pond	Spring	White River (Washington).
Hupp Springs Hatchery	Spring	White River (Washington).
Voights Creek Hatchery	Fall	Puyallup River (Washington).
Diru Creek	Fall	Puyallup River (Washington).
Clear Creek	Fall	Nisqually River (Washington).
Kalama Creek	Fall	Nisqually River (Washington).

TABLE 1.—LIST OF ARTIFICAL PROPAGATION PROGRAMS INCLUDED IN EVOLUTIONARILY SIGNIFICANT UNITS (ESUS) OF WEST COAST SALMON—Continued

Evolutionary significant unit (ESU) and included artificial propagation program(s)	Run timing	Location (state)
George Adams Hatchery	Fall	Skokomish River (Washington).
Rick's Pond Hatchery	Fall	Skokomish River (Washington).
Hamma Hamma Hatchery	Fall	Westside Hood Canal (Washington).
Dungeness/Hurd Creek Hatchery	Fall	Dungeness River (Washington).
Elwha Channel Hatchery	Fall	Elwha River (Washington).
Snake River fall-run Chinook ESU:		
Lyons Ferry Hatchery	Fall	Snake River (Washington).
Fall Chinook Acclimation Ponds Program—Pittsburg, Captain John, and Big Canyon ponds.	Fall	Snake River (Washington).
Nez Perce Tribal Hatchery—including North Lapwai Valley, Lakes Gulch, and Cedar Flat Satellite facilities.	Fall	Snake and Clearwater Rivers (Idaho).
Oxbow Hatchery	Fall	Snake River (Oregon, Idaho).
Snake River spring/summer-run Chinook ESU:		
Tucannon River Hatchery (conventional)	Spring	Tucannon River (Washington).
Tucannon River Captive Broodstock Program	Spring	Tucannon River (Washington).
Lostine River (captive/conventional)	Summer	Grande Ronde (Oregon).
Catherine Creek (captive/conventional)	Summer	Grande Ronde (Oregon).
Lookingglass Hatchery (reintroduction)	Summer	Grande Ronde (Oregon).
Upper Grande Ronde (captive/conventional)	Summer	Grande Ronde (Oregon).
Imnaha River	Spring/ Summer.	Imnaha River (Oregon).
Big Sheep Creek	Spring/ Summer.	Imnaha River (Oregon).
McCall Hatchery	Spring	South Fork Salmon River (Idaho).
Johnson Creek Artificial Propagation Enhancement	Spring	East Fork South Fork Salmon River (Idaho).
Lemhi River Captive Rearing Experiment	Spring	Lemhi River (Idaho).
Pahsimeroi Hatchery	Summer	Salmon River (Idaho).
East Fork Captive Rearing Experiment	Spring	East Fork Salmon River (Idaho).
West Fork Yankee Fork Captive Rearing Experiment	Spring	Salmon River (Idaho).
Sawtooth Hatchery	Spring	Upper Mainstem Salmon River (Idaho).
Central California Coast coho ESU:		
Don Clausen Fish Hatchery Captive Broodstock Program	n/a	Dry Creek, Russian River (California).
Scott Creek/Kingfisher Flat Hatchery Conservation Program (Monterey Bay Salmon and Trout Project).	n/a	Big Creek, Scott Creek (California).
Scott Creek Captive Broodstock Program	n/a	NOAA Southwest Fisheries Science Center, Santa Cruz (California).
Noyo River Fish Station egg-take program	n/a	Nonoyo River (California).
Southern Oregon/Northern California Coast coho ESU:		
Cole Rivers Hatchery (ODFW stock #52)	n/a	Rogue River (Oregon).
Trinity River Hatchery	n/a	Trinity River (California).
Iron Gate Hatchery	n/a	Klamath River (California).
Lower Columbia River coho ESU:		
Grays River	Type-S	Grays River (Washington).
Sea Resources Hatchery	Type-S	Grays River (Washington).
Peterson Coho Project	Type-S	Grays River (Washington).
Big Creek Hatchery (ODFW stock #13)	n/a	Big Creek (Oregon).
Astoria High School (STEP) Coho Program	n/a	Youngs Bay (Oregon).
Warrenton High School (STEP) Coho Program	n/a	Youngs Bay (Oregon).
Elochoman Type-S Coho Program	Type-S	Elochoman River (Washington).
Elochoman Type-N Coho Program	Type-N	Elochoman River (Washington).
Cathlamet High School FFA Type-N Coho Program	Type-N	Elochoman River (Washington).
Cowlitz Type-N Coho Program	Type-N	Upper Cowlitz River (Washington).
Cowlitz Type-N Coho Program	Type-N	Lower Cowlitz River (Washington).
Cowlitz Game and Anglers Coho Program	n/a	Lower Cowlitz River (Washington).
Friends of the Cowlitz Coho Program	n/a	Lower Cowlitz River (Washington).
North Fork Toutle River Hatchery	Type-S	Cowlitz River (Washington).
Kalama River Type-N Coho Program	Type-N	Kalama River (Washington).
Kalama River Type-N Coho Program	Type-S	Kalama River (Washington).
Lewis River Type-N Coho Program	Type-N	North Fork Lewis River (Washington).
Lewis River Type-S Coho Program	Type-S	North Fork Lewis River (Washington).
Fish First Wild Coho Program	n/a	North Fork Lewis River (Washington).
Fish First Type-N Coho Program	Type-N	North Fork Lewis River (Washington).
Syverson Project Type-N Coho Program	Type-N	Salmon River (Washington).
Washougal River Type-N Coho Program	Type-N	Washougal River (Washington).
Eagle Creek NFH	n/a	Clackamas River (Oregon).
Sandy Hatchery (ODFW stock #11)	Late	Sandy River (Oregon).
Bonneville/Cascade/Oxbow Complex (ODFW stock #14)	n/a	Lower Columbia River Gorge (Oregon).
Columbia River chum ESU:		
Chinook River/Sea Resources Hatchery	Fall	Chinook River (Washington).
Grays River	Fall	Grays River (Washington).

TABLE 1.—LIST OF ARTIFICAL PROPAGATION PROGRAMS INCLUDED IN EVOLUTIONARILY SIGNIFICANT UNITS (ESUS) OF WEST COAST SALMON—Continued

Evolutionary significant unit (ESU) and included artificial propagation program(s)	Run timing	Location (state)
Washougal Hatchery/Duncan Creek	Fall	Washougal River (Washington).
Hood Canal summer-run chum ESU:		
Quilcene/ Quilcene NFH	Summer	Big Quilcene River (Washington).
Hamma Hamma Fish Hatchery	Summer	Western Hood Canal (Washington).
Lilliwaup Creek Fish Hatchery	Summer	Southwestern Hood Canal (Washington).
Union River/Tahuya	Summer	Union River (Washington).
Big Beef Creek Fish Hatchery	Summer	North Hood Canal (Washington).
Salmon Creek Fish Hatchery	Summer	Discovery Bay (Washington).
Chimacum Creek Fish Hatchery	Summer	Port Townsend Bay (Washington).
Jimmycomelately Creek Fish Hatchery	Summer	Sequim Bay (Washington).

Viability Assessments of ESUs

The Pacific Salmonid BRT evaluated the risk of extinction faced by naturally spawning populations in each of the ESUs addressed in this proposed rule (NMFS, 2003b). As noted above, the BRT did not explicitly consider potential contributions of hatchery stocks or protective efforts in their evaluations. For each ESU the BRT evaluated overall extinction risk after assessing ESU-level risk for the four VSP factors: abundance, productivity, spatial structure, and diversity. We then assessed the effects of ESU hatchery programs on ESU viability and extinction risk relative to the BRT's assessment for the naturally spawning component of the ESU (NMFS, 2004b, 2005b). The effects of hatchery programs on the extinction risk of an ESU in-total were evaluated on the basis of the factors that the BRT determined are currently limiting the ESU (*e.g.*, abundance, productivity, spatial structure, and diversity), and how artificial propagation efforts within the ESU affect those factors. The Artificial Propagation Evaluation Workshop (NMFS, 2004c) reviewed the BRT's findings (NMFS, 2003a), evaluated the Salmonid Hatchery Inventory and Effects Evaluation Report (NMFS, 2004b), and assessed the overall extinction risk of ESUs with associated hatchery stocks. The BRT and the Artificial Propagation Evaluation Workshop assessed the extinction risk for the naturally spawning populations in an ESU, and for the ESU in-total, respectively. The level of extinction risk was categorized into three categories: ''in danger of extinction;'' ''likely to become endangered within the foreseeable future;'' or ''not in danger of extinction or likely to become endangered within the foreseeable future.'' Although these overall risk categories resemble the definitions of ''endangered'' and ''threatened'' as defined in the ESA, the BRT and the Workshop did not evaluate protective efforts in assessing ESU extinction risk (efforts being made to protect the species are evaluated in the ''Evaluation of Protective Efforts'' section, below). Thus, the extinction risk assessments described in this section are not necessarily indicative of whether an ESU warrants listing as a threatened or endangered species. The reader is referred to the BRT's report (NMFS, 2003b), the Salmonid Hatchery Inventory and Effects Evaluation Report (NMFS, 2004b, 2005b), and the Workshop Report (NMFS, 2004c) for more detailed descriptions of the viability of individual natural populations and hatchery stocks within these ESUs.

Snake River Sockeye ESU—The residual form of Redfish Lake sockeye, determined to be part of the ESU in 1993, is represented by a few hundred fish. Snake River sockeye historically were distributed in four lakes within the Stanley Basin, but the only remaining population resides in Redfish Lake. Only 16 naturally produced adults have returned to Redfish Lake since the Snake River sockeye ESU was listed as an endangered species in 1991. All 16 fish were taken into the Redfish Lake Captive Propagation Program, which was initiated as an emergency measure in 1991. The return of over 250 adults in 2000 was encouraging; however, subsequent returns from the captive program in 2001 and 2002 have been fewer than 30 fish.

The BRT found extremely high risks for each of the four VSP categories. Informed by this assessment, the BRT unanimously concluded that the Snake River sockeye ESU is ''in danger of extinction.''

There is a single artificial propagation program producing Snake River sockeye salmon in the Snake River basin. The Redfish Lake sockeye salmon stock was originally founded by collecting the entire anadromous adult return of 16 fish between 1990 and 1997, a small number of residual sockeye salmon, and a few hundred smolts migrating from Redfish Lake. These fish were put into a Captive Broodstock program as an emergency measure to prevent extinction of this ESU. Since 1997, nearly 400 hatchery-origin anadromous sockeye adults have returned to the Stanley Basin from juveniles released by the program. Redfish Lake sockeye salmon have also been reintroduced into Alturas and Pettit Lakes using progeny from the captive broodstock program. The captive broodstock program presently consists of several hundred fish of different year classes maintained at facilities in Eagle (Idaho) and Manchester (Washington).

Our assessment of the effects of artificial propagation on ESU extinction risk concluded that the Redfish Lake Captive Broodstock Program does not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). The Artificial Propagation Evaluation Workshop noted that the Captive Broodstock Program has prevented likely extinction of the ESU. This program has increased the total number of anadromous adults, attempted to increase the number of lakes in which sockeye salmon are present in the upper Salmon River (Stanley Basin), and preserved what genetic diversity remains in the ESU. Although the program has increased the number of anadromous adults in some years, it has yet to produce consistent returns. The majority of the ESU now resides in the captive program composed of only a few hundred fish. The long-term effects of captive rearing are unknown. The consideration of artificial propagation does not substantially mitigate the BRT's assessment of extreme risks to ESU abundance, productivity, spatial structure, and diversity. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation on the viability of the ESU

(NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Snake River sockeye ESU in-total is ''in danger of extinction'' (NMFS, 2004c).

Ozette Lake Sockeye ESU—Evaluating extinction risk for the Ozette Lake sockeye ESU is complicated by incomplete historical data with uncertain errors and biases. The Makah Tribe's fisheries program, however, is engaged in significant efforts to improve sampling techniques and to adjust for biases in historical data. The number of returning adults has increased in recent years, but is believed to be well below historical levels. Prior to 2002 an uncertain fraction of the returns was of hatchery origin, generating uncertainty in evaluating trends in the abundance and productivity of the naturally spawned component of the ESU. Accurately assessing trends in natural spawners is further complicated by the poor visibility in the lake. Habitat degradation, siltation, and alterations in the lake level regime have resulted in the loss of numerous beach spawning sites. The BRT expressed concern that the reduction in the number of spawning aggregations poses risks for ESU spatial structure and diversity.

The BRT expressed moderately high concern for each of the VSP risk categories. Informed by this risk assessment, the majority opinion of the BRT was that the naturally spawned component of the Ozette Lake sockeye ESU is ''likely to become endangered within the foreseeable future,'' with the minority being split between ''in danger of extinction'' and ''not in danger of extinction or likely to become endangered within the foreseeable future.''

There are two artificially propagated stocks considered to be part of the Ozette Lake sockeye salmon ESU (Table 1). The program, operated by the Makah Tribe, is derived from native broodstock and has the primary objective of establishing viable sockeye salmon spawning aggregations in two Ozette Lake tributaries where spawning has not been observed for many decades, if ever. The program includes research, monitoring, and evaluation activities designed to determine success in recovering the propagated populations to viable levels, and to determine the demographic, ecological, and genetic effects on target and non-target (*i.e.*, Ozette Lake beach) spawning aggregations. The Makah Program will be reevaluated for termination (or continuation) after 12 years of operation.

Our assessment of the effects of artificial propagation on ESU extinction risk concluded that the Makah supplementation program at Umbrella Creek and Big River does not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). The program has increased the abundance of natural spawners and natural-origin sockeye in the Ozette Lake tributaries. However, it is unknown whether these tributaries were historically spawning habitat. The program (by design) has not increased the abundance of natural spawners or natural origin beach spawners in Ozette Lake. Despite the relative increases in abundance due to the supplementation program, the total ESU abundance remains small for a single sockeye population. The contribution of artificial propagation to the ESU's productivity is uncertain. Only since 2000 have the hatchery returns been sufficient to meet the program's broodstock goals. The Makah program at present serves as an important genetic reserve with the continuing loss of beach spawning habitat. The reintroduction of spawners to Ozette Lake tributaries reduces risks to ESU spatial structure. Although there currently is no evidence of genetic divergence between the hatchery program and the founding population, the isolation of the hatchery program and adaptation to tributary habitats may in time cause the tributary spawning aggregations to diverge from founding beach spawning aggregations. Although the program has a beneficial effect on ESU abundance and spatial structure, it has neutral or uncertain effects on ESU productivity and diversity. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Ozette Lake sockeye ESU in-total is ''likely to become endangered in the foreseeable future'' (NMFS, 2004c).

Sacramento River Winter-run Chinook ESU—The Sacramento River winter-run ESU is represented by a single extant naturally spawning population that has been completely displaced from its historical spawning habitat by the construction of Shasta and Keswick Dams. The remaining spawning habitat is artificially maintained by cold-water releases from the reservoir behind Shasta Dam. The naturally spawning component of the ESU has exhibited marked improvements in abundance and productivity in recent years. The recent increases in abundance are encouraging, relative to the years of critically low abundance of the 1980s and early 1990s; however, the recent 5-year geometric mean is only 3 percent of the peak post-1967 5-year geometric mean. The BRT was particularly concerned about risks to the ESU's diversity and spatial structure. Construction of Shasta Dam merged at least four independent winter-run Chinook populations into a single population, representing a substantial loss of genetic diversity, life-history variability, and local adaptation. Episodes of critically low abundance, particularly in the early 1990s, for the single remaining population imposed ''bottlenecks'' that further reduced genetic diversity. The BRT found extremely high risk for each of the four VSP risk categories. Informed by this risk assessment, the majority opinion of the BRT was that the naturally spawned component of the Sacramento winter-run ESU is ''in danger of extinction.'' The minority opinion of the BRT was that the ESU is ''likely to become endangered within the foreseeable future.''

Two artificial propagation programs are considered to be part of the Sacramento River winter-run Chinook ESU (Table 1; NMFS, 2005b). The artificial propagation of winter-run Chinook is carried out at the Livingston Stone National Fish Hatchery (NFH) on the mainstem Sacramento River above Keswick Dam. The captive broodstock program is maintained at two locations: the Livingston Stone NFH and at the University of California's Bodega Marine Laboratory. These programs have been operated for conservation purposes since the early 1990s and both were identified as high priority recovery actions in NMFS' 1997 Draft Recovery Plan for this ESU. The artificial propagation program was established to supplement the abundance of the naturally spawning winter-run Chinook population and thereby assist in its population growth and recovery. The captive broodstock program was established in the early 1990s when the naturally spawning population was at critically low levels (less than 200 spawners) in order to preserve the ESU's remaining genetic resources and to establish a reserve for potential use in the artificial propagation program. Because of increased natural escapement over the last several years, consideration is being given to terminating the captive broodstock program.

An assessment of the effects of these artificial propagation programs on the viability of the ESU in-total concluded that they decrease risk to some degree by contributing to increased ESU abundance and diversity, but have a neutral or uncertain effect on

productivity and spatial structure of the ESU (NMFS, 2005b). Spawning escapement of winter-run Chinook has increased since the inception of the program and may account for up to 10 percent of the total number of fish spawning naturally in a given year. Improvements in freshwater habitat conditions, harvest management, as well as improved ocean conditions, however, are thought to be the major factors responsible for the increased abundance of the ESU since the early 1990s. Effects on productivity are uncertain, but studies are underway to assess the effect of artificial propagation on fitness and productivity of artificially propagated fish. Although abundance of spawners has increased, in part due to artificial propagation, the spatial distribution of spawners has not expanded. The primary reason is that the naturally spawning population is artificially maintained by cool water releases from Shasta/Keswick dams, and the spatial distribution of spawners is largely governed by water year type and the ability of the Central Valley Project to manage water temperatures in the upper Sacramento River. A second naturally spawning population is considered critical to the long-term viability of this ESU, and plans are underway to eventually establish a second population in the upper Battle Creek watershed using the artificial propagation program as a source of fish. However, the program has yet to be implemented because of the need to complete habitat restoration efforts in that watershed. The artificial propagation program has contributed to maintaining diversity of the ESU through careful use of spawning protocols and other tools that maximize genetic diversity of propagated fish and minimize impacts on naturally spawning populations. In addition, the artificial propagation and captive broodstock programs collectively serve as a genetic repository which serves to preserve the genome of the ESU.

Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that this ESU in-total is ''in danger of extinction'' (NMFS, 2004c).

Central Valley Spring-run Chinook ESU—Extensive construction of dams throughout the Sacramento-San Joaquin Basin has reduced the California Central Valley spring Chinook ESU to only a small portion of its historical distribution, generating concerns about risks to the spatial structure and diversity of the ESU. The ESU has been reduced to only three naturally spawning independent populations that are free of hatchery influence from an estimated 17 historical populations. These three populations (Deer, Mill and Butte Creek which are tributaries to the Sacramento River) are in close geographic proximity, increasing the ESU's vulnerability to disease or catastrophic events. There are other natural populations (*i.e.*. Clear, Antelope, Big Chico, and Beegum Creeks) of spring Chinook, but the Central Valley Technical Recovery Team considers them to be dependent upon the populations in Deer, Mill, and Butte Creek. As discussed in the Summary of Comments and Information Received (see Issue 14), the naturally spawning spring Chinook of hatchery origin in the Feather and Yuba Rivers are also considered to be part of this ESU as is the spring-run Chinook hatchery stock at Feather River Hatchery. The BRT was concerned that the Feather River spring-run Chinook hatchery population represents a risk factor for the naturally spawning populations in Deer, Mill and Butte Creeks. The Feather River Hatchery produces spring-run Chinook that are genetically more similar to fall-run Chinook, probably due to hybridization at the hatchery, though these fish still exhibit an early returning ''spring'' behavior. The off-site release location for fish produced at the hatchery is believed to contribute to a high straying rate of hatchery fish which increases the likelihood the Feather River hatchery origin fish could interact negatively with the extant natural populations in the ESU. To address these concerns, CDFG initiated efforts in 2002 to restore and enhance the spring run genotype at the Feather River Hatchery. Although the recent 5-year mean abundance for the three naturally spawning populations in the ESU remains small (ranging from nearly 500 to over 4,500 spawners), short- and long-term productivity trends are positive, and population sizes have shown continued increases over the abundance levels of the 1980s (with 5-year mean population sizes of 67 to 243 spawners). The BRT noted moderately high risk for the abundance, spatial structure, and diversity VSP factors, and a lower risk for the productivity factor reflecting recent positive trends. Informed by this risk assessment, the strong majority opinion of the BRT was that the Central Valley spring-run Chinook ESU is ''likely to become endangered within the foreseeable future.'' The minority opinion of the BRT was that the ESU is ''in danger of extinction.'' There Feather River Hatchery spring-run Chinook stock included in this ESU does not mitigate the BRT's assessment that the ESU is ''likely to become endangered within the foreseeable future.''

California Coastal Chinook ESU—Evaluation of the viability of the naturally spawning component of the California Coastal Chinook ESU is hindered by the limited availability of data, particularly regarding the abundance and spatial distribution of natural populations within the ESU. Additionally, the data that are available are of varying type, quality and temporal coverage, and are generally not amenable to rigorous estimation of abundance or robust statistical analyses of trends. The little historical and current abundance information that is available indicates that (putative) natural ESU population abundance levels remain depressed relative to historical levels. Evidence suggests that populations have been extirpated or nearly extirpated in the southern part of the ESU, or are extremely low in abundance. This observation, in combination with the apparent loss of the spring-run Chinook life history in the Eel River Basin and elsewhere in the ESU, indicates risks to the diversity of the ESU. Recently available natural abundance estimates in the Russian River are in excess of 1,300 fish for 2000–2002. These data suggest either the presence of a naturally producing population in the Russian River, or represent straying from other basins or ESUs. No data are available to assess the genetic relationship of the Russian River fish to populations in this or other ESUs. The BRT found moderately high risks for all VSP risk categories, and underscored a strong concern due to the paucity of information and the resultant uncertainty generated in evaluating the ESU's viability. Informed by this risk assessment and the related uncertainty, the majority opinion of the BRT was that the naturally spawned component of the California Coastal Chinook ESU is ''likely to become endangered within the foreseeable future.'' The minority opinion of the BRT was that the naturally spawned component of the ESU is ''in danger of extinction.''

Seven artificial propagation programs that produce Chinook salmon are considered to be part of the California Coastal Chinook ESU (Table 1; NMFS, 2005b). Six of these programs (Freshwater Creek, Yager Creek, Redwood Creek, Hollow Tree Creek, Mattole River Salmon Group, and Mad River Hatchery) are relatively small programs with production goals of less than 80,000 fish that have been operated for restoration purposes for more than

20 years. Because of State funding limitations, it is likely that these programs will be terminated after 2004. These programs are small-scale supplementation facilities operated by local groups or companies in cooperation with the CDFG under its cooperative hatchery program. The Van Arsdale Fish Station has been operated for over 30 years by CDFG for supplementation purposes in the upper Eel River. Because of State funding limitations, the operations at the Station were terminated in 2003. The seven hatchery programs are primarily located in the northern portion of the ESU's range and most are in the Eel River.

An assessment of the effects of these small artificial propagation programs on the viability of the ESU in-total concluded that they collectively decrease risk to some degree by contributing to local increases in abundance, but have a neutral or uncertain effect on productivity, spatial structure or diversity of the ESU (NMFS, 2005b). There have been no demonstrable increases in natural abundance from the five cooperative hatchery programs, with the possible exception of increased abundance in the Freshwater Creek natural population and as a result of the rescue and rearing activities by the Mattole Salmon Group. In part, this is because there is limited natural population monitoring in the watersheds where the hatchery programs are located. No efforts have been undertaken to assess the productivity of hatchery produced fish or to assess the effects of hatchery produced fish on natural origin fish productivity. The seven hatchery populations in this ESU are primarily located in the northern portion of the ESU's range and overlap with natural origin fish populations. With the exception of Freshwater Creek where local distribution may have expanded in association with the natural population increase, there are no demonstrable beneficial effects on spatial structure. The six cooperative programs use only natural-origin fish as broodstock and mark all production with an adipose fin clip to ensure that hatchery-origin fish are not incorporated into the broodstock.

Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that this ESU in-total is ''likely to become endangered within the foreseeable future'' (NMFS, 2004c).

Upper Willamette River Chinook ESU—There are no direct estimates of natural-origin spawner abundance for the Upper Willamette River Chinook ESU. The abundance of adult spring Chinook salmon (hatchery and natural fish) passing Willamette Falls has remained relatively steady over the past 50 years (ranging from approximately 20,000 to 70,000 fish), but is only a fraction of peak abundance levels observed in the 1920s (approximately 300,000 adults). Interpretation of abundance levels is confounded by a high but uncertain fraction of hatchery produced fish. The McKenzie River population has shown substantial increases in total abundance (hatchery origin and natural origin fish) in the last 2 years, while trends in other natural populations in the ESU are generally mixed. With the relatively large incidence of naturally spawning hatchery fish in the ESU, it is difficult to determine trends in productivity for natural-origin fish. The BRT estimated that despite improving trends in total productivity (including hatchery origin and natural origin fish) since 1995, productivity would be below replacement in the absence of artificial propagation. The BRT was particularly concerned that approximately 30 to 40 percent of total historical habitat is now inaccessible behind dams. These inaccessible areas, however, represent a majority of the historical spawning habitat. The restriction of natural production to just a few areas increases the ESU's vulnerability to environmental variability and catastrophic events. Losses of local adaptation and genetic diversity through the mixing of hatchery stocks within the ESU, and the introgression of out-of-ESU hatchery fall-run Chinook, have represented threats to ESU diversity. However, the BRT was encouraged by the recent cessation of releases of the fall-run hatchery fish, as well as by improved marking rates of hatchery fish to assist in monitoring and in the management of a marked-fish selective fishery.

The BRT found moderately high risks for all VSP categories. Informed by this risk assessment, the strong majority opinion of the BRT was that the naturally spawned component of the Upper Willamette River Chinook ESU is ''likely to become endangered within the foreseeable future.'' The minority opinion was that this ESU is ''in danger of extinction.''

Seven artificial propagation programs in the Willamette River produce fish that are considered to be part of the Upper Willamette River Chinook ESU. All of these programs are funded to mitigate for lost or degraded habitat and produce fish for harvest purposes.

Our assessment of the effects of artificial propagation on ESU extinction risk concluded that these hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). An increasing proportion of hatchery-origin returns has contributed to increases in total ESU abundance. However, it is unclear whether these returning hatchery and natural fish actually survive overwintering to spawn. Estimates of pre-spawning mortality indicate that a high proportion (>70 percent) of spring Chinook die before spawning in most ESU populations. In recent years, hatchery fish have been used to reintroduce spring Chinook back into historical habitats above impassible dams (*e.g.*, in the South Santiam, North Santiam, and McKenzie Rivers), slightly decreasing risks to ESU spatial structure. Within-ESU hatchery fish exhibit differing life-history characteristics from natural ESU fish. High proportions of hatchery-origin natural spawners in remaining natural production areas (*i.e.*, in the Clackamas and McKenzie Rivers) may thereby have negative impacts on within and among population genetic and life-history diversity. Collectively, artificial propagation programs in the ESU have a slight beneficial effect on ESU abundance and spatial structure, but neutral or uncertain effects on ESU productivity and diversity. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Upper Willamette River Chinook ESU in-total is ''likely to become endangered in the foreseeable future'' (NMFS, 2004c).

Lower Columbia River Chinook ESU—Many populations within the Lower Columbia River Chinook ESU have exhibited pronounced increases in abundance and productivity in recent years, possibly due to improved ocean conditions. Abundance estimates of naturally spawned populations in this ESU, however, are uncertain due to a high (approximately 70 percent) fraction of naturally spawning hatchery fish and a low marking rate (only 1 to 2 percent) of hatchery produced fish. Abundance estimates of naturally produced spring Chinook have improved since 2001 due to the marking of all hatchery spring Chinook releases, allowing for the enumeration of hatchery spring Chinook at weirs, traps and on spawning grounds. Despite recent improvements, long-term trends in productivity are below replacement for the majority of

populations in the ESU. It is estimated that 8 to 10 of approximately 31 historical populations in the ESU have been extirpated or nearly extirpated. Although approximately 35 percent of historical habitat has been lost in this ESU due to the construction of dams and other impassable barriers, this ESU exhibits a broad spatial distribution in a variety of watersheds and habitat types. Natural production currently occurs in approximately 20 populations, although only one population has a mean spawner abundance exceeding 1,000 fish. The BRT expressed concern that the spring-run populations comprise most of the extirpated populations. The disproportionate loss of the spring-run life history represents a risk for ESU diversity. Additionally, of the four hatchery spring-run Chinook populations considered to be part of this ESU, two are propagated in rivers that are within the historical geographic range of the ESU but that likely did not support spring-run populations. High hatchery production in the Lower Columbia River poses genetic and ecological risks to the natural populations in the ESU, and complicates assessments of their performance. The BRT also expressed concern over the introgression of out-of-ESU hatchery stocks.

The BRT found moderately high risks for all VSP categories. Informed by this risk assessment, the majority opinion of the BRT was that the naturally spawned component of the Lower Columbia River Chinook ESU is ''likely to become endangered within the foreseeable future,'' with the minority being split between ''in danger of extinction'' and ''not in danger of extinction or likely to become endangered within the foreseeable future.''

There are 17 artificial propagation programs releasing hatchery Chinook salmon that are considered to be part of the Lower Columbia River Chinook ESU (Table 1). All of these programs are designed to produce fish for harvest, with three of these programs also being implemented to augment the naturally spawning populations in the basins where the fish are released. These three programs integrate naturally produced spring Chinook salmon into the broodstock in an attempt to minimize the genetic effects of returning hatchery adults that spawn naturally.

Our assessment of the effects of artificial propagation on ESU extinction risk concluded that these hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Hatchery programs have increased total returns and numbers of fish spawning naturally, thus reducing risks to ESU abundance. Although these hatchery programs have been successful at producing substantial numbers of fish, their effect on the productivity of the ESU in-total is uncertain. Additionally, the high level of hatchery production in this ESU poses potential genetic and ecological risks to the ESU, and confounds the monitoring and evaluation of abundance trends and productivity. The Cowlitz River spring Chinook salmon program produces parr for release into the upper Cowlitz River Basin in an attempt to re-establish a naturally spawning population above Cowlitz Falls Dam. Such reintroduction efforts increase the ESU's spatial distribution into historical habitats, and slightly reduce risks to ESU spatial structure. The few programs that regularly integrate natural fish into the broodstock may help preserve genetic diversity within the ESU. However, the majority of hatchery programs in the ESU have not converted to the regular incorporation of natural broodstock, thus limiting this risk reducing feature at the ESU scale. Past and ongoing transfers of broodstock among hatchery programs in different basins represent a risk to within and among population diversity. Collectively, artificial propagation programs in the ESU provide slight benefits to ESU abundance, spatial structure, and diversity, but have neutral or uncertain effects on ESU productivity. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Lower Columbia River Chinook ESU in-total is ''likely to become endangered in the foreseeable future'' (NMFS, 2004c).

Upper Columbia River Spring-run Chinook ESU—All populations in the Upper Columbia River spring-run Chinook ESU exhibited pronounced increases in abundance in 2001. These increases are particularly encouraging following the last decade of steep declines to record, critically low escapements. Despite strong returns in 2001, both recent 5-year and long term productivity trends remain below replacement. The five hatchery spring-run Chinook populations considered to be part of this ESU (Table 1) are programs aimed at supplementing natural production areas. These programs have contributed substantially to the abundance of fish spawning naturally in recent years. However, little information is available to assess the impact of these high levels of supplementation on the long-term productivity of natural populations. Spatial structure in this ESU was of little concern as there is passage and connectivity among almost all ESU populations, although it is estimated that approximately 58 percent of historical habitat has been lost. During years of critically low escapement (1996 and 1998) extreme management measures were taken in one of the three major spring Chinook producing basins by collecting all returning adults into hatchery supplementation programs. Such actions reflect the ongoing vulnerability of certain segments of this ESU. The BRT expressed concern that these actions, while appropriately guarding against the catastrophic loss of populations, may have compromised ESU population structure and diversity.

The BRT's assessment of risk for the four VSP categories reflects strong concerns regarding abundance and productivity, and comparatively less concern for ESU spatial structure and diversity. The BRT's assessment of overall extinction risk faced by the naturally spawned component of the Upper Columbia River spring-run Chinook ESU was divided between ''in danger of extinction'' and ''likely to become endangered within the foreseeable future,'' with a slight majority opinion that the ESU is ''in danger of extinction.''

Six artificial propagation programs in the Upper Columbia River Basin produce spring-run Chinook in the Methow and Wenatchee Rivers that are considered to be part of the Upper Columbia River spring-run Chinook ESU (Table 1). The Entiat NFH operating in the Entiat River is not included in the ESU, and is intended to remain isolated from the local natural population. The within ESU hatchery programs are conservation programs intended to contribute to the recovery of the ESU by increasing the abundance and spatial distribution of naturally spawned fish, while maintaining the genetic integrity of populations within the ESU. Three of the conservation programs incorporate local natural broodstock to minimize adverse genetic effects, and follow broodstock protocols guarding against the overcollection of the natural run. The remaining within-ESU hatchery programs are captive broodstock programs. These programs also adhere to strict protocols for the collection, rearing, maintenance, and mating of the captive brood populations. All of the six artificial propagation programs considered to be part of the ESU include extensive monitoring and evaluation efforts to continually evaluate the extent and implications of

any genetic and behavioral differences that might emerge between the hatchery and natural stocks.

Genetic evidence suggests that the within-ESU programs remain closely related to the naturally spawned populations and maintain local genetic distinctiveness of populations within the ESU. The captive broodstock programs may exhibit lower fecundity and younger average age-at-maturity compared to the natural populations from which they were derived. However, the extensive monitoring and evaluation efforts employed afford the adaptive management of any unintended adverse effects. Habitat Conservation Plans (HCPs) with the Chelan and Douglas Public Utility Districts and binding mitigation agreements ensure that these programs will have secure funding and will continue into the future. These hatchery programs have undergone ESA section 7 consultation to ensure that they do not jeopardize the continued existence of the ESU, and they have received ESA section 10 permits for production through 2007. Annual reports and other specific information reporting requirements ensure that the terms and conditions as specified by NMFS are followed. These programs, through adherence to best professional practices, have not experienced disease outbreaks or other catastrophic losses.

Our assessment of the effects of artificial propagation on ESU extinction risk concluded that these hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Overall, the hatchery programs in the ESU have increased the total abundance of fish considered to be part of the ESU. Specifically, the two hatchery programs in the Wenatchee Basin have contributed to reducing abundance risk. However, it is uncertain whether the four programs in the Methow Basin have provided a net benefit to abundance. The contribution of ESU hatchery programs to the productivity of the ESU in-total is uncertain. The overall impact of the hatchery programs on ESU spatial structure is neutral. The Wenatchee Basin programs are managed to promote appropriate spatial structure, and they likely reduce spatial structure risk in that basin. The Methow Basin hatchery programs, however, concentrate spawners near the hatchery facilities, altering population spatial structure and increasing vulnerability to catastrophic events. Overall, within-ESU hatchery programs do not moderate risks to ESU diversity. The Wenatchee Basin programs do help preserve population diversity though the incorporation of natural-origin fish into broodstock. The Methow Basin programs, however, incorporate few natural fish with hatchery-origin fish predominating on the spawning grounds. Additionally, the presence of out-of-ESU Carson stock Chinook in the Methow Basin remains a concern, although the stock is in the process of being terminated. The out-of-ESU Entiat hatchery program is a source of significant concern to the ESU. The Entiat stock may have introgressed significantly with or replaced the native population. Although the artificial propagation programs in the ESU have a slight beneficial effect on ESU abundance, they do not mitigate other key risk factors identified by the BRT. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Upper Columbia River spring-run Chinook ESU in-total is ''in danger of extinction'' (NMFS, 2004c).

Puget Sound Chinook ESU—Assessing extinction risk for the Puget Sound Chinook ESU is complicated by high levels of hatchery production and a limited availability of information on the fraction of natural spawners that are of hatchery-origin. Although populations in the ESU have not experienced the dramatic increases in abundance in the last 2 to 3 years that have been evident in many other ESUs, more populations have shown modest increases in escapement in recent years than have declined (13 populations versus nine). Most populations have a recent 5-year mean abundance of fewer than 1,500 natural spawners, with the Upper Skagit population being a notable exception (the recent 5-year mean abundance for the Upper Skagit population approaches 10,000 natural spawners). Currently observed abundances of natural spawners in the ESU are several orders of magnitude lower than estimated historical spawner capacity, and well below peak historical abundance (approximately 690,000 spawners in the early 1900s). Recent 5-year and long-term productivity trends remain below replacement for the majority of the 22 extant populations of Puget Sound Chinook. The BRT was concerned that the concentration of the majority of natural production in just a few subbasins represents a significant risk. Natural production areas, due to their concentrated spatial distribution, are vulnerable to extirpation due to catastrophic events. The BRT was concerned by the disproportionate loss of early run populations and its impact on the diversity of the Puget Sound Chinook ESU. The Puget Sound Technical Recovery Team has identified 31 historical populations (Ruckelshaus *et al.*, 2002), nine of which are believed to be extinct, most of which were ''early run'' or ''spring'' populations. Past hatchery practices that transplanted stocks among basins within the ESU and present programs using transplanted stocks that incorporate little local natural broodstock represent additional risk to ESU diversity. In particular, the BRT noted that the pervasive use of Green River stock, and stocks subsequently derived from the Green River stock, throughout the ESU may reduce the genetic diversity and fitness of naturally spawning populations.

The BRT found moderately high risks for all VSP categories. Informed by this risk assessment, the strong majority opinion of the BRT was that the naturally spawned component of the Puget Sound Chinook ESU is ''likely to become endangered within the foreseeable future.'' The minority opinion was in the ''not in danger of extinction or likely to become endangered within the foreseeable future'' category.

There are currently 26 programs artificially propagating Puget Sound Chinook salmon that are considered to be part of the ESU (Table 1). Eight of the programs are directed at conservation, and are specifically implemented to preserve and increase the abundance of native populations in their natal watersheds where habitat needed to sustain the populations naturally at viable levels has been lost or degraded. Each of these conservation hatchery programs includes research, monitoring, and evaluation activities designed to determine success in recovering the propagated populations to viable levels, and to determine the demographic, ecological, and genetic effects of each program on target and non-target salmonid populations. The remaining programs considered to be part of the ESU are operated primarily for fisheries harvest augmentation purposes (some of which also function as research programs) using transplanted within-ESU-origin Chinook salmon as broodstock.

Our assessment of the effects of artificial propagation on ESU extinction risk concluded that these hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). The conservation and hatchery augmentation programs collectively have increased the total abundance of the ESU. The conservation programs

have increased the abundance of naturally spawning Chinook, and likely have reduced abundance risks for these populations. The large numbers of Chinook produced by the harvest augmentation programs, however, have resulted in considerable numbers of strays. Any potential benefits from these programs to abundance likely are offset by increased ecological and genetic risks. There is no evidence that any of the 26 ESU hatchery programs have contributed to increased abundances of natural-origin Chinook, despite decades of infusing natural spawning areas with hatchery fish. The contribution of ESU hatchery programs to the productivity of the ESU in-total is uncertain. Four programs are planting hatchery fish above impassible dams, providing some benefit to ESU spatial structure. However, the ongoing practice of transplanting stocks within the ESU and incorporating little natural local-origin broodstock continues to pose significant risks to ESU spatial structure and diversity. The conservation hatchery programs function to preserve remaining genetic diversity, and likely have prevented the loss of several populations. Among the harvest augmentation programs are yearling Chinook release programs. Yearling Chinook programs may be harmful to local natural-origin populations due to increased risks of predation and the reduction of within-population diversity. Collectively, artificial propagation programs in the ESU provide a slight beneficial effect to ESU abundance and spatial structure, but neutral or uncertain effects to ESU productivity and diversity. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Puget Sound Chinook ESU in-total is ''likely to become endangered in the foreseeable future'' (NMFS, 2004c).

Snake River Fall-run Chinook ESU—The abundance of natural-origin spawners in the Snake River fall-run Chinook ESU for 2001 (2,652 adults) was in excess of 1,000 fish for the first time since counts began at the Lower Granite Dam in 1975. The recent 5-year mean abundance of 871 naturally produced spawners, however, generated concern that despite recent improvements, the abundance level is very low for an entire ESU. With the exception of the marked increase in 2001, the ESU has fluctuated between approximately 500 to 1,000 natural spawners since 1975, suggesting a higher degree of stability in growth rate at low population levels than is seen in other salmonid populations. Increasing returns reflect improved ocean conditions, improved management of the mainstem hydrosystem flow regime, decreased harvest, and an increasing contribution from the Lyons Ferry Hatchery supplementation program. However, due to the large fraction of naturally spawning hatchery fish, it is difficult to assess the productivity of the natural population. Depending upon the assumption made regarding the reproductive contribution of hatchery fish, long-term and short-term trends in productivity are at or above replacement. It is estimated that approximately 80 percent of historical spawning habitat was lost (including the most productive areas) with the construction of a series of Snake River mainstem dams. The loss of spawning habitats and the restriction of the ESU to a single extant naturally spawning population increase the ESU's vulnerability to environmental variability and catastrophic events. The diversity associated with populations that once resided above the Snake River dams has been lost, and the impact of straying out-of-ESU fish has the potential to further compromise ESU diversity. Recent improvements in the marking of out-of-ESU hatchery fish and their removal at Lower Granite Dam have reduced the impact of these strays. However, introgression below Lower Granite Dam remains a concern. The BRT voiced concern that the practice of collecting fish below Lower Granite Dam for broodstock incorporates non-ESU strays into the Lyons Ferry Hatchery program, and poses additional risks to ESU diversity. Straying of out-of-ESU hatchery fall Chinook salmon from outside the Snake River Basin was identified as a major risk factor in the late 1980s to mid 1990s. Out-of-ESU hatchery strays have been much reduced due to the removal of hatchery strays at downstream dams, and a reduction in the number of fish released into the Umatilla River (where the majority of out-of-ESU strays originated).

The BRT found moderately high risk for all VSP categories. Informed by this risk assessment, the majority opinion of the BRT was that the naturally spawned component of the Snake River fall-run Chinook ESU is ''likely to become endangered within the foreseeable future.'' The minority opinion assessed ESU extinction risk as ''in danger of extinction,'' although a slight minority fell in the ''not in danger of extinction or likely to become endangered within the foreseeable future'' category.

There are four artificial propagation programs producing Snake River fall Chinook salmon in the Snake River basin, all based on the Lyons Ferry Hatchery stock and considered to be part of the Snake River fall-run Chinook ESU (Table 1). When naturally spawning fall Chinook declined to fewer than 100 fish in 1991, most of the genetic legacy of this ESU was preserved in the Lyons Ferry Hatchery broodstock (NMFS, 1991c). These four hatchery programs are managed to enhance listed Snake River fall Chinook salmon and presently include the Lyons Ferry Hatchery, Fall Chinook Acclimation Ponds Program, Nez Perce Tribal Hatchery, and Oxbow Hatchery (an Idaho Power Company mitigation hatchery). These existing programs release fish into the mainstem Snake River and Clearwater River which represent the majority of the remaining habitat available to this ESU.

Our assessment of the effects of artificial propagation on ESU extinction risk concluded that these hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). These hatchery programs have contributed to the recent substantial increases in total ESU abundance, including both natural-origin and hatchery-origin ESU components. Spawning escapement has increased to several thousand adults (from a few hundred in the early 1990s) due in large part to increased releases from these hatchery programs. These programs collectively have had a beneficial effect on ESU abundance in recent years. The BRT noted, however, that the large but uncertain fraction of naturally spawning hatchery fish complicates assessments of ESU productivity. The contribution of ESU hatchery programs to the productivity of the ESU in-total is uncertain. As ESU abundance has increased in recent years, ESU spatial distribution has increased. The Snake River fall-run Chinook hatchery programs contributed to this reduction in risk to ESU spatial distribution. The Lyons Ferry stock has preserved genetic diversity during critically low years of abundance. However, the ESU-wide use of a single hatchery broodstock may pose long-term genetic risks, and may limit adaptation to different habitat areas. Although the ESU presently consists of a single independent population, it was most likely composed of diverse production centers. Additionally, the broodstock collection practices employed pose risks to ESU spatial structure and diversity. Release

strategies practiced by the ESU hatchery programs (*e.g.*, extended captivity for about 15 percent of the fish before release) are in conflict with the Snake River fall-run Chinook life history, and may compromise ESU diversity. Collectively, artificial propagation programs in the ESU provide slight benefits to ESU abundance, spatial structure, and diversity, but have neutral or uncertain effects on ESU productivity. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Snake River fall-run Chinook ESU in-total is ''likely to become endangered in the foreseeable future'' (NMFS, 2004c).

Snake River Spring/Summer Chinook ESU—The aggregate return (including hatchery and natural-origin fish) of Snake River spring/summer-run Chinook in 2001 exhibited a large increase over recent abundances. Many, but not all, of the 29 natural production areas within the ESU experienced large abundance increases in 2001 as well, with two populations nearing the abundance levels specified in NMFS' 1995 Proposed Snake River Recovery Plan (NMFS, 1995b). However, approximately 79 percent of the 2001 return of spring-run Chinook was of hatchery origin. Short-term productivity trends were at or above replacement for the majority of natural production areas in the ESU, although long-term productivity trends remain below replacement for all natural production areas, reflecting the severe declines since the 1960s. Although the number of spawning aggregations lost in this ESU due to the establishment of the Snake River mainstem dams is unknown, this ESU has a wide spatial distribution in a variety of locations and habitat types. The BRT considered it a positive sign that the out-of-ESU Rapid River broodstock has been phased out of the Grande Ronde system. There is no evidence of wide-scale straying by hatchery stocks, thereby alleviating diversity concerns somewhat. Nonetheless, the high level of hatchery production in this ESU complicates the assessments of trends in natural abundance and productivity.

The BRT found moderately high risk for the abundance and productivity VSP factors, and comparatively lower risk for spatial structure and diversity. Informed by this risk assessment, the majority opinion of the BRT was that the naturally spawned component of the Snake River spring/summer-run Chinook ESU is ''likely to become endangered within the foreseeable future.'' The minority opinion assessed ESU extinction risk as ''in danger of extinction,'' although a slight minority concluded that the ESU is in the ''not in danger of extinction or likely to become endangered within the foreseeable future'' category.

There are 15 artificial propagation programs producing spring/summer-run Chinook salmon that are considered to be part of the Snake River spring/summer-run Chinook ESU (Table 1). A portion of these programs are managed to enhance listed natural populations, including the use of captive broodstock hatcheries in the upper Salmon River, Lemhi River, East Fork Salmon River, and Yankee Fork populations. These enhancement programs all use broodstocks founded from the local native populations. Currently, the use of non-ESU broodstock sources is restricted to Little Salmon/Rapid River (lower Salmon River tributary), mainstem Snake River at Hells Canyon, and the Clearwater River.

Our assessment of the effects of artificial propagation on ESU extinction risk concluded that these hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Overall, these hatchery programs have contributed to the increases in total ESU abundance and in the number of natural spawners observed in recent years. The contribution of ESU hatchery programs to the productivity of the ESU in-total is uncertain. Some reintroduction and outplanting of hatchery fish above barriers and into vacant habitat has occurred, providing a slight benefit to ESU spatial structure. All of the within-ESU hatchery stocks are derived from local natural populations and employ management practices designed to preserve genetic diversity. The Grande Ronde Captive Broodstock programs likely have prevented the extirpation of the local natural populations. Additionally, hatchery releases are managed to maintain wild fish reserves in the ESU in an effort to preserve natural local adaptation and genetic variability. Collectively, artificial propagation programs in the ESU provide benefits to ESU abundance, spatial structure, and diversity, but have neutral or uncertain effects on ESU productivity. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Snake River spring/summer-run Chinook ESU in-total is ''likely to become endangered in the foreseeable future'' (NMFS, 2004c).

Central California Coast Coho ESU—Information on the abundance and productivity trends for the naturally spawning component of the Central California Coast coho ESU is extremely limited. There are no long-term time series of spawner abundance for individual river systems. Analyses of juvenile coho presence-absence information, juvenile density surveys, and irregular adult counts for the South Fork Noyo River indicate low abundance and long-term downward trends for the naturally spawning populations throughout the ESU. Improved ocean conditions coupled with favorable stream flows and harvest restrictions have contributed to increased returns in 2001 in streams in the northern portion of the ESU, as indicated by an increase in the observed presence of fish in historically occupied streams. Data are particularly lacking for many river basins in the southern two-thirds of the ESU where naturally spawning populations are considered to be at the greatest risk. The extirpation or near extirpation of natural coho salmon populations in several major river basins, and across most of the southern historical range of the ESU, represents a significant risk to ESU spatial structure and diversity. Artificial propagation of coho salmon within the Central California Coast ESU has declined since the ESU was listed in 1996 though it continues at the Noyo River and Scott Creek facilities, and two captive broodstock populations have recently been established. Genetic diversity risk associated with out-of-basin transfers appears to be minimal, but diversity risk from domestication selection and low effective population sizes in the remaining hatchery programs remains a concern. An out-of-ESU artificial propagation program for coho was operated at the Don Clausen hatchery on the Russian River through the mid 1990s, but was terminated in 1996. Termination of this program was considered by the BRT as a positive development for naturally produced coho in this ESU. For the naturally spawning component of the ESU, the BRT found very high risk for the abundance, productivity, and spatial structure VSP parameters and comparatively moderate risk with respect to the diversity VSP parameter. The lack of direct estimates of the performance of the naturally spawned populations in this ESU, and the associated uncertainty this generates, was of specific concern to the BRT. Informed by the VSP risk assessment

and the associated uncertainty, the strong majority opinion of the BRT was that the naturally spawned component of the Central California Coast coho ESU was ''in danger of extinction.'' The minority opinion was that this ESU is ''likely to become endangered within the foreseeable future.''

Four artificial propagation programs are considered to be part of the Central California Coast coho ESU (Table 1; NMFS, 2005b). The Noyo River program is an augmentation program located in the northern portion of the ESU which regularly incorporates local natural-origin fish into the broodstock and releases fish into the Noyo River watershed. The program has been in operation for over 50 years, but the program has recently been discontinued. The Monterey Bay Salmon and Trout Project is an artificial propagation program that is operated as a conservation program designed to supplement the local natural population, located in the southern portion of the ESU (south of San Francisco) where natural populations are at the highest risk of extinction. Relatively small numbers of fish are spawned and released from this program on Scott Creek, but natural-origin fish are routinely incorporated into the broodstock. Recently, captive broodstock programs have been established for the Russian River and Scott Creek populations in order to preserve the genetic resources of these two naturally spawning populations and for use in artificial programs. Artificially propagated fish from these two captive broodstock programs will be outplanted in the Russian River and Scott Creek watersheds to supplement local natural populations. The Russian River program is integrated with a habitat restoration program designed to improve habitat conditions and subsequent survival for outplanted coho juveniles.

An assessment of the effects of these four artificial propagation programs on the viability of the ESU in-total concluded that they decrease risk of extinction to some degree by contributing to increased ESU abundance and diversity, but have a neutral or uncertain effect on the productivity or spatial structure of the ESU (NMFS, 2005b). The three conservation programs are considered crucial to the recovery of this ESU, but it is unclear if they have had any beneficial effect on natural spawner abundance. The Noyo River program which had been operated for over 50 years is being terminated because it has not met CDFG's goal of increasing coho salmon abundance. Productivity of coho salmon in the Noyo River is thought to be reduced or unaffected by long term artificial propagation in that watershed. It is uncertain how effective the captive broodstock and rearing programs in the Russian River and Scott Creek will be in increasing productivity, but efforts in the Russian River are coupled with a major habitat restoration effort which may improve natural population productivity. The two captive broodstock programs will hopefully contribute to future abundance and improved spatial structure of the ESU, but out-planting has yet to be implemented so long term benefits are uncertain. The Monterey Bay Salmon and Trout Program is thought to be responsible for sustaining the presence of natural origin coho salmon in Scott Creek, which is at the southern extent of the ESU's range. Both of the captive broodstock programs, particularly the Scott Creek program, are genetic repositories which serve to preserve the genome of the ESU thereby reducing genetic diversity risks. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Central California Coast coho ESU in-total is ''in danger of extinction'' (NMFS, 2004c).

Southern Oregon/Northern California Coast Coho ESU—The only reliable time series of adult abundance for the naturally spawning component of the Southern Oregon/Northern California Coast coho ESU is for the Rogue River population in southern Oregon. The California portion of the ESU is characterized by a paucity of data, with only a few available spawner indices and presence-absence surveys. The recent 5-year mean abundance for the Rogue River is approximately 5,000 natural spawners and is the highest such abundance for the Rogue River data series (since 1980). Both long- and short-term productivity trends for Rogue River natural spawners are above replacement. The BRT concluded, based on an analysis of pre-harvest abundance, however, that these positive trends for the Rogue River population reflect the effects of reduced harvest rather than improved freshwater conditions and population productivity. Less reliable indices of spawner abundance in several California populations suggest flat or declining trends. Relatively low levels of observed presence in historically occupied coho streams (32–56 percent from 1986 to 2000) indicate continued low abundance in the California portion of this ESU. Indications of stronger 2001 returns in several California populations, presumably due to favorable freshwater and ocean conditions, is encouraging but must be evaluated in the context of more than a decade of generally poor performance. Nonetheless, the high occupancy rate of historical streams in 2001 suggests that much habitat remains accessible to coho salmon. Although extant populations reside in all major river basins within the ESU, the BRT was concerned about the loss of local populations in the Trinity, Klamath, and Rogue river systems. The high hatchery production in these systems may mask trends in ESU population structure and pose risks to ESU diversity. The recent termination of several out-of-ESU hatcheries in California is expected to result in decreased risks to ESU diversity. The BRT found moderately high risks for abundance and productivity VSP categories, with comparatively lower risk for spatial structure and diversity. Informed by this risk assessment, the strong majority opinion of the BRT was that the naturally spawned component of the Southern Oregon/Northern California Coast coho ESU is ''likely to become endangered within the foreseeable future.'' The minority opinion assessed ESU extinction risk as ''in danger of extinction,'' although a slight minority concluded that the ESU is in the ''not in danger of extinction or likely to become endangered within the foreseeable future'' category.

There are three artificial propagation programs releasing hatchery coho salmon that are considered to be part of the Southern Oregon/Northern California Coast Coho ESU. The Rogue River hatchery in Oregon and the Trinity River and Iron Gate hatcheries (Klamath River) in California are all mitigation programs designed to produce fish for harvest, but they integrate naturally produced coho salmon into the broodstock in an attempt to minimize the genetic effects of returning hatchery adults that spawn naturally. All three programs have been in operation for several decades with smolt production goals ranging from 75,000 to 500,000 fish.

An assessment of the effects of these three artificial propagation programs on the viability of the ESU in-total concluded that they decrease risk of extinction by contributing to increased ESU abundance, but have a neutral or uncertain effect on the productivity, spatial structure and diversity of the ESU (NMFS, 2005b). Abundance of the ESU in-total has been increased as a result of these artificial propagation programs, particularly in the Rogue and Trinity Rivers. In the Rogue River,

hatchery origin fish have averaged approximately half of the returning spawners over the past 20 years. In the Trinity River, most naturally spawning fish are thought to be of hatchery origin based on weir counts at Willow Creek. The effects of these artificial propagation programs on ESU productivity and spatial structure are limited. Only three rivers have hatchery populations and natural populations are depressed throughout the range of the ESU. The effects of these hatchery programs on ESU diversity are likely limited. Natural origin fish have been incorporated into the broodstock but the magnitude of natural fish use is unknown. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Southern Oregon/ Northern California Coast coho ESU in-total is ''likely to become endangered in the foreseeable future'' (NMFS, 2004c).

Lower Columbia River Coho ESU—There are only two extant populations in the Lower Columbia River coho ESU with appreciable natural production (the Clackamas and Sandy River populations), from an estimated 23 historical populations in the ESU. Although adult returns in 2000 and 2001 for the Clackamas and Sandy River populations exhibited moderate increases, the recent 5-year mean of natural-origin spawners for both populations represents less than 1,500 adults. The Sandy River population has exhibited recruitment failure in 5 of the last 10 years, and has exhibited a poor response to reductions in harvest. During the 1980s and 1990s natural spawners were not observed in the lower tributaries in the ESU. Coincident with the 2000–2001 abundance increases in the Sandy and Clackamas populations, a small number of coho spawners of unknown origin have been surveyed in some lower tributaries. Short- and long-term trends in productivity are below replacement. Approximately 40 percent of historical habitat is currently inaccessible, which restricts the number of areas that might support natural production, and further increases the ESU's vulnerability to environmental variability and catastrophic events. The extreme loss of naturally spawning populations, the low abundance of extant populations, diminished diversity, and fragmentation and isolation of the remaining naturally produced fish confer considerable risks to the ESU. The paucity of naturally produced spawners in this ESU is contrasted by the very large number of hatchery produced adults. The abundance of hatchery coho returning to the Lower Columbia River in 2001 and 2002 exceeded one million and 600,000 fish, respectively. The BRT expressed concern that the magnitude of hatchery production continues to pose significant genetic and ecological threats to the extant natural populations in the ESU. However, these hatchery stocks at present collectively represent a significant portion of the ESU's remaining genetic resources. The 25 hatchery stocks considered to be part of the ESU (Table 1), if appropriately managed, may prove essential to the restoration of more widespread naturally spawning populations.

The BRT found extremely high risks for each of the VSP categories. Informed by this risk assessment, the strong majority opinion of the BRT was that the naturally spawned component of the Lower Columbia River coho ESU is ''in danger of extinction.'' The minority opinion was that the ESU is ''likely to become endangered within the foreseeable future.''

All of the 25 hatchery programs included in the Lower Columbia River coho ESU are designed to produce fish for harvest, with two small programs designed to also augment the natural spawning populations in the Lewis River Basin. Artificial propagation in this ESU continues to represent a threat to the genetic, ecological, and behavioral diversity of the ESU. Past artificial propagation efforts imported out-of-ESU fish for broodstock, generally did not mark hatchery fish, mixed broodstocks derived from different local populations, and transplanted stocks among basins throughout the ESU. The result is that the hatchery stocks considered to be part of the ESU represent a homogenization of populations. Several of these risks have recently begun to be addressed by improvements in hatchery practices. Out-of-ESU broodstock is no longer used, and near 100-percent marking of hatchery fish is employed to afford improved monitoring and evaluation of broodstock and (hatchery- and natural-origin) returns. However, many of the within-ESU hatchery programs do not adhere to best hatchery practices. Eggs are often transferred among basins in an effort to meet individual program goals, further compromising ESU spatial structure and diversity. Programs may use broodstock that does not reflect what was historically present in a given basin, limiting the potential for artificial propagation to establish locally adapted naturally spawning populations. Many programs lack Hatchery and Genetic Management Plans that establish escapement goals appropriate for the natural capacity of each basin, and that identify goals for the incorporation of natural-origin fish into the broodstock.

Our assessment of the effects of artificial propagation on ESU extinction risk concluded that hatchery programs collectively mitigate the immediacy of extinction risk for the Lower Columbia River coho ESU in-total in the short term, but that these programs do not substantially reduce the extinction risk of the ESU in the foreseeable future (NMFS, 2004c). At present, within ESU hatchery programs significantly increase the abundance of the ESU in-total. Without adequate long-term monitoring, the contribution of ESU hatchery programs to the productivity of the ESU in-total is uncertain. The hatchery programs are widely distributed throughout the Lower Columbia River, reducing the spatial distribution of risk to catastrophic events. Additionally, reintroduction programs in the Upper Cowlitz River may provide additional reduction of ESU spatial structure risks. As mentioned above, the majority of the ESU's genetic diversity exists in the hatchery programs. Although these programs have the potential of preserving historical local adaptation and behavioral and ecological diversity, the manner in which these potential genetic resources are presently being managed poses significant risks to the diversity of the ESU in-total. At present, the Lower Columbia River coho hatchery programs reduce risks to ESU abundance and spatial structure, provide uncertain benefits to ESU productivity, and pose risks to ESU diversity. Overall, artificial propagation mitigates the immediacy of ESU extinction risk in the short-term, but is of uncertain contribution in the long term.

Over the long term, reliance on the continued operation of these hatchery programs is risky (NMFS, 2005b). Several Lower Columbia River coho hatchery programs have been terminated, and there is the prospect of additional closures in the future. With each hatchery closure, any potential benefits to ESU abundance and spatial structure are reduced. Risks of operational failure, disease, and environmental catastrophes further complicate assessments of hatchery contributions over the long term. Additionally, the two extant naturally spawning populations in the ESU were described by the BRT as being ''in danger of extinction.'' Accordingly, it is likely that the Lower Columbia River coho ESU may exist in hatcheries only

within the foreseeable future. It is uncertain whether these isolated hatchery programs can persist without the incorporation of natural-origin fish into the broodstock. Although there are examples of salmonid hatchery programs having been in operation for relatively long periods of time, these programs have not existed in complete isolation. Long-lived hatchery programs historically required infusions of wild fish in order to meet broodstock goals. The long-term sustainability of such isolated hatchery programs is unknown. It is uncertain whether the Lower Columbia River coho isolated hatchery programs are capable of mitigating risks to ESU abundance and productivity into the foreseeable future. In isolation, these programs may also become more than moderately diverged from the evolutionary legacy of the ESU, and hence no longer merit inclusion in the ESU. Under either circumstance, the ability of artificial propagation to buffer the immediacy of extinction risk over the long-term is uncertain. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the short- and long-term effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Lower Columbia coho ESU in-total is ''likely to become endangered in the foreseeable future'' (NMFS, 2004c).

Columbia River Chum ESU—Approximately 90 percent of the historical populations in the Columbia River chum ESU are extirpated or nearly so. During the 1980s and 1990s, the combined abundance of natural spawners for the Lower and Upper Columbia River Gorge, Washougal, and Grays River populations was below 4,000 adults. In 2002, however, the abundance of natural spawners exhibited a substantial increase evident at several locations in the ESU. The preliminary estimate of natural spawners is approximately 20,000 adults. The cause of this dramatic increase in abundance is unknown. Improved ocean conditions, the initiation of a supplementation program in the Grays River, improved flow management at Bonneville Dam, favorable freshwater conditions, and increased survey sampling effort may all have contributed to the elevated 2002 abundance. However, long- and short-term productivity trends for ESU populations are at or below replacement. The loss of off-channel habitats and the extirpation of approximately 17 historical populations increase the ESU's vulnerability to environmental variability and catastrophic events. The populations that remain are low in abundance, and have limited distribution and poor connectivity.

The BRT found high risks for each of the VSP categories, particularly for ESU spatial structure and diversity. Informed by this risk assessment, the majority opinion of the BRT was that the naturally spawned component of the Columbia River chum ESU is ''likely to become endangered within the foreseeable future,'' with a minority opinion that it is ''in danger of extinction.''

There are three artificial propagation programs producing chum salmon considered to be part of the Columbia River chum ESU. These are conservation programs designed to support natural production. The Washougal Hatchery artificial propagation program provides artificially propagated chum salmon for re-introduction into recently restored habitat in Duncan Creek, Washington. This program also serves as a genetic reserve for the naturally spawning population in the mainstem Columbia River below Bonneville Dam, which can access only a portion of spawning habitat during low flow conditions. The other two programs are designed to augment natural production in the Grays River and the Chinook River in Washington. All these programs use naturally produced adults for broodstock. These programs were only recently established (1998–2002), with the first hatchery chum returning in 2002.

Our assessment of the effects of artificial propagation on ESU extinction risk concluded that these hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). The Columbia River chum hatchery programs have only recently been initiated, and are beginning to provide benefits to ESU abundance. The contribution of ESU hatchery programs to the productivity of the ESU in-total is uncertain. The Sea Resources and Washougal Hatchery programs have begun to provide benefits to ESU spatial structure through reintroductions of chum salmon into restored habitats in the Chinook River and Duncan Creek, respectively. These three programs have a neutral effect on ESU diversity. Collectively, artificial propagation programs in the ESU provide a slight beneficial effect to ESU abundance and spatial structure, but have neutral or uncertain effects on ESU productivity and diversity. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Columbia River chum ESU in-total is ''likely to become endangered in the foreseeable future'' (NMFS, 2004c).

Hood Canal Summer Chum ESU—Adult returns for some populations in the Hood Canal summer-run chum ESU showed modest improvements in 2000, with upward trends continuing in 2001 and 2002. The recent 5-year mean abundance is variable among populations in the ESU, ranging from one fish to nearly 4,500 fish. Hood Canal summer-run chum are the focus of an extensive rebuilding program developed and implemented since 1992 by the state and tribal co-managers. Two populations (the combined Quilcene and Union River populations) are above the conservation thresholds established by the rebuilding plan. However, most populations remain depressed. Estimates of the fraction of naturally spawning hatchery fish exceed 60 percent for some populations, indicating that reintroduction programs are supplementing the numbers of total fish spawning naturally in streams. Long-term trends in productivity are above replacement for only the Quilcene and Union River populations. Buoyed by recent increases, seven populations are exhibiting short-term productivity trends above replacement. Of an estimated 16 historical populations in the ESU, seven populations are believed to have been extirpated or nearly extirpated. Most of these extirpations have occurred in populations on the eastern side of Hood Canal, generating additional concern for ESU spatial structure. The widespread loss of estuary and lower floodplain habitat was noted by the BRT as a continuing threat to ESU spatial structure and connectivity. There is some concern that the Quilcene hatchery stock is exhibiting high rates of straying, and may represent a risk to historical population structure and diversity. However, with the extirpation of many local populations, much of this historical structure has been lost, and the use of Quilcene hatchery fish may represent one of a few remaining options for Hood Canal summer-run chum conservation.

The BRT found high risks for each of the VSP categories. Informed by this risk assessment, the majority opinion of the BRT was that the naturally spawned component of the Hood Canal summer-run chum ESU is ''likely to become endangered within the foreseeable

future,'' with a minority opinion that the ESU is ''in danger of extinction.''

There are currently eight programs releasing summer chum salmon that are considered to be part of the Hood Canal summer chum ESU (Table 1). Six of the programs are supplementation programs implemented to preserve and increase the abundance of native populations in their natal watersheds. These supplementation programs propagate and release fish into the Salmon Creek, Jimmycomelately Creek, Big Quilcene River, Hamma Hamma River, Lilliwaup Creek, and Union River watersheds. The remaining two programs use transplanted summer-run chum salmon from adjacent watersheds to reintroduce populations into Big Beef Creek and Chimacum Creek, where the native populations have been extirpated. Each of the hatchery programs includes research, monitoring, and evaluation activities designed to determine success in recovering the propagated populations to viable levels, and to determine the demographic, ecological, and genetic effects of each program on target and non-target salmonid populations. All the Hood Canal summer-run chum hatchery programs will be terminated after 12 years of operation.

Our assessment of the effects of artificial propagation on ESU extinction risk concluded that these hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). The hatchery programs are reducing risks to ESU abundance by increasing total ESU abundance as well as the number of naturally spawning summer-run chum salmon. Several of the programs have likely prevented further population extirpations in the ESU. The contribution of ESU hatchery programs to the productivity of the ESU in-total is uncertain. The hatchery programs are benefiting ESU spatial structure by increasing the spawning area used in several watersheds and by increasing the geographic range of the ESU through reintroductions. These programs also provide benefits to ESU diversity. By bolstering total population sizes, the hatchery programs have likely stemmed adverse genetic effects for populations at critically low levels. Additionally, measures have been implemented to maintain current genetic diversity, including the use of native broodstock and the termination of the programs after 12 years of operation to guard against long-term domestication effects. Collectively, artificial propagation programs in the ESU presently provide a slight beneficial effect to ESU abundance, spatial structure, and diversity, but uncertain effects to ESU productivity. The long-term contribution of these programs after they are terminated is uncertain. Despite the current benefits provided by the comprehensive hatchery conservation efforts for Hood Canal summer-run chum, the ESU remains at low overall abundance with nearly half of historical populations extirpated. Informed by the BRT's findings (NMFS, 2003b) and our assessment of the effects of artificial propagation programs on the viability of the ESU (NMFS, 2005b), the Artificial Propagation Evaluation Workshop concluded that the Hood Canal summer-run chum ESU in-total is ''likely to become endangered in the foreseeable future'' (NMFS, 2004c).

Summary of Factors Affecting the Species

Section 4(a)(1) of the ESA and our implementing regulations (50 CFR part 424) set forth procedures for listing species. The Secretary of Commerce (Secretary) must determine, through the regulatory process, if a species is endangered or threatened because of any one or a combination of the following factors: (1) The present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; or (5) other natural or human-made factors affecting its continued existence. We have previously detailed the impacts of various factors contributing to the decline of Pacific salmon and *O. mykiss* (*e.g.*, see summary of previous ESU listing determinations in the proposed rule, 69 FR 33102, June 14, 2004; NMFS 1998c, ''Factors Contributing to the Decline of Chinook Salmon—An Addendum to the 1996 West Coast Steelhead Factors for Decline Report;'' NMFS 1996a, ''Factors for Decline—A Supplement to the Notice of Determination for West Coast Steelhead Under the Endangered Species Act''). These **Federal Register** notices and technical reports conclude that all of the factors identified in section 4(a)(1) of the ESA have played a role in the decline of West Coast salmon and *O. mykiss* ESUs. The reader is referred the summary of factors affecting the species provided in the proposed rule (69 FR at 33141 through 33142; June 14, 2004), and references therein, for a more detailed treatment of the species' factors for decline.

Efforts Being Made to Protect West Coast Salmonids

Section 4(b)(1)(A) of the ESA requires the Secretary to make listing determinations solely on the basis of the best scientific and commercial data available after taking into account efforts being made to protect a species. Therefore, in making ESA listing determinations, we first assess an ESU's level of extinction risk and identify factors that have led to its decline. We then assess existing efforts being made to protect the species to determine if those measures ameliorate the risks faced by the ESU.

In judging the efficacy of existing protective efforts, we rely on the joint NMFS–FWS ''Policy for Evaluation of Conservation Efforts When Making Listing Decisions'' (''PECE;'' 68 FR 15100; March 28, 2003). PECE provides direction for the consideration of protective efforts identified in conservation agreements, conservation plans, management plans, or similar documents (developed by Federal agencies, state and local governments, Tribal governments, businesses, organizations, and individuals) that have not yet been implemented, or have been implemented but have not yet demonstrated effectiveness. The policy articulates several criteria for evaluating the certainty of implementation and effectiveness of protective efforts to aid in determination of whether a species warrants listing as threatened or endangered.

During our update of the status for the 16 ESUs addressed in this final rule, we reviewed protective efforts ranging in scope from regional conservation strategies to local watershed initiatives. The principal protective efforts affecting these West Coast salmonid ESUs were summarized in the June 14, 2004, proposed rule (69 FR 33102). Informed by the public comments received and based on our review, we conclude that collectively protective efforts do not provide sufficient certainty of implementation and effectiveness to substantially ameliorate the level of assessed extinction risk for all of the 16 ESUs addressed in this notice. While we acknowledge that many of the ongoing protective efforts are likely to promote the conservation of listed salmonids, most efforts are relatively recent, have yet to indicate their effectiveness, and few address conservation needs at scales sufficient to conserve entire ESUs. We conclude that existing protective efforts lack the certainty of implementation and effectiveness to preclude listing the 16 ESUs addressed in this final rule. Nonetheless, we will continue to

encourage these and other future protective efforts, and we will continue to collaborate with tribal, federal, state, and local entities to promote and improve efforts being made to protect the species.

Final Listing Determinations

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

We conclude that for the 16 West Coast salmon and *O. mykiss* ESUs addressed in this final rule, four ESUs are endangered, and 12 ESUs are threatened. Collectively, these 16 ESUs include 132 artificial propagation programs. Informed by the *Alsea* ruling and consistent with the final Hatchery Listing Policy, which appears elsewhere in this edition of the **Federal Register**, any artificial propagation programs considered to be part of an ESU will be included in the listing if it is determined that the ESU in-total is threatened or endangered. Table 2 at the end of this section provides a summary of these final listing determinations.

Snake River Sockeye ESU

The BRT unanimously concluded that the Snake River sockeye ESU is ''in danger of extinction.'' Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that the Redfish Lake captive broodstock program does not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''in danger of extinction.'' We conclude that the ESU in-total is in danger of extinction throughout all or a significant portion of its range, and determine that the Snake River sockeye ESU continues to warrant listing under the ESA as an endangered species.

Ozette Lake Sockeye ESU

The BRT concluded that the naturally spawned component of the Ozette Lake sockeye ESU is ''likely to become endangered within the foreseeable future.'' Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that the within-ESU hatchery programs do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''likely to become endangered within the foreseeable future.'' We conclude that the ESU in-total is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and determine that the Ozette Lake sockeye ESU continues to warrant listing under the ESA as a threatened species.

Sacramento River Winter-Run Chinook ESU

The BRT concluded that the naturally spawned component of the Sacramento winter-run Chinook ESU is ''in danger of extinction.'' Informed by the BRT's findings (NMFS, 2003b) and the assessment of artificial propagation programs on the viability of the ESU (NMFS, 2004b), the Artificial Propagation Evaluation Workshop concluded that the Sacramento River winter-run Chinook ESU in-total is presently ''in danger of extinction'' (NMFS, 2004c). Major efforts have been undertaken by NMFS and others over the past decade to assess the viability of, and conduct research on, the winter-run Chinook population; implement freshwater and ocean harvest management conservation efforts; and implement a wide range of habitat conservation measures. The State of California has listed winter-run Chinook under the California Endangered Species Act, implemented freshwater harvest management conservation measures, and increased monitoring and evaluation efforts in support of conserving this ESU. Harvest and habitat conservation efforts have improved the ESU's abundance and productivity over the past decade. These efforts include: Changes in Central Valley Project and State Water Project operations and other actions undertaken pursuant to implementation of the Central Valley Project biological opinions that have increased freshwater survival; changes in salmon ocean harvest pursuant to the ocean harvest biological opinion that have increased ocean survival and adult escapement; and implementation of habitat restoration efforts (*e.g.* Ecosystem Restoration Program) throughout the Central Valley as a result of the CVPIA and CALFED programs and other central valley habitat restoration projects. A key concern of the BRT was the lack of diversity within this ESU and the fact that it is represented by a single extant population at present. Although significant efforts are underway through the CALFED ecosystem restoration program to restore habitat and anadromous fish access to Battle Creek which would provide an opportunity for this ESU to establish a second population, it is uncertain whether this program will be fully implemented, funded or successful in achieving the goal of establishing a second population. Although many important efforts have been and continue to be implemented, we do not believe that the protective efforts being implemented for this ESU, as evaluated pursuant to PECE, provide sufficient certainty of implementation and effectiveness to alter the BRT's and Artificial Propagation Workshop's assessments that the ESU is ''in danger of extinction.'' We find, therefore, that the Sacramento River winter-run Chinook ESU in-total is in danger of extinction throughout all or a significant portion of its range and conclude that the ESU continues to warrant listing as an endangered species under the ESA.

Central Valley Spring-Run Chinook ESU

The BRT concluded that the Central Valley spring-run Chinook ESU is ''likely to become endangered within the foreseeable future'' (NMFS, 2003b). Because the Feather River Hatchery spring Chinook stock was not considered to be part of the ESU at the time, the Artificial Propagation Evaluation Workshop did not address this ESU. Although consideration of the naturally spawning spring-run Chinook in the Feather River and the hatchery stock would likely reduce ESU risk in terms of abundance, it is unlikely to benefit any other VSP factors such as productivity, spatial structure, or diversity. If ongoing efforts to further isolate the spring-run phenotype in the Feather River are successful, the risks to the ESU's spatial structure and diversity would likely be reduced. Substantial protective efforts have been implemented to benefit this ESU, but as evaluated pursuant to PECE, they do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''likely to become endangered within the foreseeable future.'' We conclude that the ESU in-total is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and determine that the Central Valley spring-run Chinook ESU continues to warrant listing as threatened under the ESA.

California Coastal Chinook ESU

The BRT concluded that the naturally spawned component of the California Coastal Chinook ESU is ''likely to become endangered within the foreseeable future.'' Our assessment of artificial propagation programs on the viability of the ESU concluded that the California Coastal Chinook ESU in-total is ''likely to become endangered within the foreseeable future'' (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''likely to become endangered within the foreseeable future.'' We conclude that the ESU in-total is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and determine that the California Coastal Chinook ESU continues to warrant listing as a threatened species under the ESA.

Upper Willamette River Chinook ESU

The BRT concluded that the naturally spawned component of the Upper Willamette River Chinook ESU is ''likely to become endangered within the foreseeable future.'' Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that the within-ESU hatchery programs do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''likely to become endangered within the foreseeable future.'' We conclude that the ESU in-total is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and determine that the Upper Willamette River Chinook ESU continues to warrant listing under the ESA as a threatened species.

Lower Columbia River Chinook ESU

The BRT concluded that the naturally spawned component of the Lower Columbia River Chinook ESU is ''likely to become endangered within the foreseeable future.'' Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that the within-ESU hatchery programs do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''likely to become endangered within the foreseeable future.'' We conclude that the ESU in-total is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and determine that the Lower Columbia River Chinook ESU continues to warrant listing under the ESA as a threatened species.

Upper Columbia River Spring-Run Chinook ESU

The BRT was divided on the extinction risk faced by the naturally spawned component of the Upper Columbia River spring-run Chinook ESU between ''in danger of extinction'' and ''likely to become endangered within the foreseeable future,'' with a slight majority finding that the ESU is ''in danger of extinction.'' Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that the within-ESU hatchery programs do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is in danger of extinction or likely to become so in the foreseeable future. We conclude that the ESU in-total is in danger of extinction throughout all or a significant portion of its range, and determine that the Upper Columbia River spring-run Chinook ESU continues to warrant listing under the ESA as an endangered species.

Puget Sound Chinook ESU

The BRT concluded that the naturally spawned component of the Puget Sound Chinook ESU is ''likely to become endangered within the foreseeable future.'' Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that the within-ESU hatchery programs do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''likely to become endangered within the foreseeable future.'' We conclude that the ESU in-total is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and determine that the Puget Sound Chinook ESU continues to warrant listing under the ESA as a threatened species.

Snake River Fall-Run Chinook ESU

The BRT concluded that the Snake River fall-run Chinook ESU is ''likely to become endangered within the foreseeable future.'' Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that the within-ESU hatchery programs do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''likely to become endangered within the foreseeable future.'' We conclude that the ESU in-total is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and determine that the Snake River fall-run Chinook ESU continues to warrant listing under the ESA as a threatened species.

Snake River Spring/Summer Chinook ESU

The BRT concluded that the Snake River spring/summer-run Chinook ESU is ''likely to become endangered within the foreseeable future.'' Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that the within-ESU hatchery programs do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''likely to become endangered within the foreseeable future.'' We conclude that the ESU in-total is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and determine that the Snake River spring/summer-run Chinook ESU continues to warrant listing under the ESA as a threatened species.

Central California Coast Coho ESU

The BRT concluded that the naturally spawned component of the Central California Coast coho ESU is ''in danger of extinction.'' Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that the within-ESU hatchery programs do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''in danger of extinction.'' We conclude that the ESU in-total is in danger of extinction throughout all or a

significant portion of its range. We determine that the Central California Coast coho ESU, presently listed as a threatened species, warrants listing as an endangered species under the ESA.

Southern Oregon/Northern California Coast Coho ESU

The BRT concluded that the naturally spawned component of the Southern Oregon/Northern California Coast coho ESU is ''likely to become endangered within the foreseeable future.'' Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that the within-ESU hatchery programs do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''likely to become endangered within the foreseeable future.'' We conclude that the ESU in-total is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and determine that the Southern Oregon/Northern California Coast coho ESU continues to warrant listing under the ESA as a threatened species.

Lower Columbia River Coho ESU

The BRT concluded that the naturally spawned component of the Lower Columbia River coho ESU is ''in danger of extinction.'' The BRT observed that although the scale of artificial propagation poses genetic and ecological threats to the two extant natural populations in the ESU, the within-ESU hatchery programs represent a substantial proportion of the genetic resources remaining in the ESU. However, the manner in which the majority of these hatchery fish are being produced does not adhere to best management practices, and may be compromising the integrity of these genetic resources. Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that hatchery programs collectively mitigate the immediacy of extinction risk for the Lower Columbia River coho ESU in-total in the short term, but that these programs do not substantially reduce the extinction risk of the ESU in the foreseeable future (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''likely to become endangered within the foreseeable future.'' We conclude that the ESU in-total is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and determine that Lower Columbia River coho ESU warrants listing under the ESA as a threatened species.

Columbia River Chum ESU

The BRT concluded that the Columbia River chum ESU is ''likely to become endangered within the foreseeable future.'' Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that the within-ESU hatchery programs do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''likely to become endangered within the foreseeable future.'' We conclude that the ESU in-total is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and determine that the Columbia River chum ESU continues to warrant listing under the ESA as a threatened species.

Hood Canal Summer Chum ESU

The BRT concluded that the naturally spawned component of the Hood Canal summer-run chum ESU is ''likely to become endangered within the foreseeable future.'' Our assessment of the effects of artificial propagation on the ESU's extinction risk concluded that the within-ESU hatchery programs do not substantially reduce the extinction risk of the ESU in-total (NMFS, 2004c). Protective efforts, as evaluated pursuant to PECE, do not provide sufficient certainty of implementation and effectiveness to alter the assessment that the ESU is ''likely to become endangered within the foreseeable future. We conclude that the ESU in-total is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and determine that the Hood Canal summer chum ESU continues to warrant listing under the ESA as a threatened species.

TABLE 2.—SUMMARY OF THE PREVIOUS ENDANGERED SPECIES ACT (ESA) STATUS AND THE FINAL LISTING DETERMINATIONS FOR 16 EVOLUTIONARY SIGNIFICANT UNITS (ESUS) OF WEST COAST SALMON

Evolutionarily significant unit (ESU)	Previous ESA listing status	Final listing determination	Number of artificial propagation programs included in the ESU
Snake River sockeye ESU	Endangered	Endangered	1
Ozette Lake sockeye ESU	Threatened	Threatened	2
Sacramento River winter-run Chinook ESU	Endangered	Endangered	2
Central Valley spring-run Chinook ESU	Threatened	Threatened	1
California Coastal Chinook ESU	Threatened	Threatened	7
Upper Willamette River Chinook	Threatened	Threatened	7
Lower Columbia River Chinook ESU	Threatened	Threatened	17
Upper Columbia River spring-run Chinook ESU	Endangered	Endangered	6
Puget Sound Chinook ESU	Threatened	Threatened	26
Snake River fall-run Chinook ESU	Threatened	Threatened	4
Snake River spring/summer-run Chinook ESU	Threatened	Threatened	15
Central California Coast coho ESU	Threatened	Endangered	4
Southern Oregon/Northern California Coast coho ESU	Threatened	Threatened	3
Lower Columbia River coho ESU	Threatened	Threatened	25
Columbia River chum ESU	Threatened	Threatened	3
Hood Canal summer-run chum ESU	Threatened	Threatened	8

Prohibitions and Protective Regulations

ESA section 9(a) take prohibitions (16 U.S.C. 1538(a)(1)(B)) apply to all species listed as endangered. Hatchery stocks determined to be part of endangered ESUs are afforded the full protections of the ESA. In the case of threatened species, ESA section 4(d) leaves it to the Secretary's discretion to determine whether and to what extent conservation measures may be appropriate, and directs the agency to issue regulations it considers necessary and advisable for the conservation of the species. NMFS has flexibility under section 4(d) to tailor protective regulations based on the contributions of available conservation measures. The 4(d) protective regulations may prohibit, with respect to threatened species, some or all of the acts which section 9(a) of the ESA prohibits with respect to endangered species.

Previously Promulgated 4(d) Protective Regulations

NMFS has already adopted ESA 4(d) rules that exempt or ''limit'' a range of activities from the take prohibitions for certain threatened salmon and *O. mykiss* ESUs (62 FR 38479, July 18, 1997; 65 FR 42422, July 10, 2000; 65 FR 42485, July 10, 2000; 67 FR 1116, January 9, 2002). Currently there are a total of 29 ''limits'' to ESA Section 9(a) ''take'' prohibitions for threatened salmonid ESUs (see the proposed rule, and references therein, for a more detailed description of the specific 4(d) limits; 69 FR at 33166; June 14, 2004). The previously promulgated limits do not apply to all threatened ESUs, and several of the limits are redundant, outdated, or are located disjunctly in the Code of Federal Regulations (CFR).

The first six of these limits (50 CFR 223.204(b)(1) through (b)(6)) were published as an interim rule in 1997 for the Southern Oregon/Northern California Coast coho ESU (62 FR 38479, July 18, 1997). These six limits allow for the take of coho salmon in Oregon and California, under certain circumstances, if the take is: Part of approved fisheries management plans; part of an approved hatchery program; part of approved fisheries research and monitoring activities; or part of approved habitat restoration activities.

In 2000, NMFS promulgated 13 limits affecting, in total, 14 ESUs in California, Oregon, and Washington (65 FR 42422, July 10, 2000; 50 CFR 223.203(b)(1) through (b)(13)). These ''limits'' include: Paragraph (b)(1) activities conducted in accordance with ESA section 10 take authorization; paragraph (b)(2) scientific or artificial propagation activities with pending applications at the time of rulemaking; paragraph (b)(3) emergency actions related to injured, stranded, or dead salmonids; paragraph (b)(4) fishery management activities; paragraph (b)(5) hatchery and genetic management plans; paragraph (b)(6) activities in compliance with joint tribal/state plans developed within *United States (U.S.)* v. *Washington* or *U.S.* v. *Oregon;* paragraph (b)(7) scientific research activities permitted or conducted by the states; paragraph (b)(8) state, local, and private habitat restoration activities; paragraph (b)(9) properly screened water diversion devices; paragraph (b)(10) routine road maintenance activities; paragraph (b)(11) certain park pest management activities in Portland, Oregon; paragraph (b)(12) certain municipal, residential, commercial, and industrial development and redevelopment activities; and paragraph (b)(13) forest management activities on state and private lands within the State of Washington. The Southern Oregon/Northern California Coasts coho ESU was included under two of these 13 limits (limits 50 CFR 223.203(b)(1) and (b)(3)). The limits published in 2000 that addressed fishery and harvest management, scientific research, and habitat restoration activities did not supersede the six limits for the Southern Oregon/Northern California Coast coho ESU promulgated in the 1997 interim rule, despite addressing the same types of activities (although for different ESUs). Also in 2000, NMFS issued a limit for all threatened ESUs exempting activities undertaken consistent with an approved tribal resource management plan (65 FR 42485, July 10, 2000; 50 CFR 223.209).

In 2002, NMFS added an additional nine limits (67 FR 1116, January 9, 2002; 50 CFR 223.203(b)(14) through (b)(22)) addressing four salmonid ESUs in California: the Central Valley spring-run Chinook, California Coastal Chinook, Central California Coast coho, and Northern California *O. mykiss* ESUs. These limits are essentially identical to limits previously promulgated in 2000. These additional nine limits similarly address emergency actions, fishery management activities, artificial propagation programs, scientific research, habitat restoration activities, properly screened water diversions, routine road maintenance activities, and development and redevelopment activities. Rather than including the four California ESUs under the limits promulgated in 2000, these ESUs were treated under separate limits.

Final Amendments to the 4(d) Protective Regulations

As part of this final rulemaking we are amending the existing 4(d) protective regulations for threatened salmon and *O. mykiss* ESUs to: (1) Provide needed flexibility in fisheries and hatchery management, and (2) simplify and clarify the existing regulations so that they may be more efficiently and effectively accessed and interpreted by all affected parties. The specific changes being made to the application of the take prohibitions and limits under 4(d) are described in the following two subsections (''Changes in the Application of the Take Prohibitions,'' and ''Clarifying Amendments to the 4(d) Protective Regulations'').

Changes in the Application of the Take Prohibitions—We are finalizing an amendment to the existing 4(d) protective regulations to provide the necessary flexibility to ensure that fisheries and artificial propagation programs are managed consistently with the conservation needs of ESA-listed ESUs. For threatened salmon and *O. mykiss* ESUs, we will apply section 4(d) protections to natural and hatchery fish with an intact adipose fin, but not to listed hatchery fish that have had their adipose fin removed prior to release into the wild. (The removal (''clipping'') of the adipose fin from hatchery fish prior to their release into the natural environment is a commonly employed method for the marking of hatchery production.) Many hatcheries produce fish that are not part of a listed ESU, while others produce fish that are part of a listed ESU (and thus also listed in this final rule) but are surplus to conservation and recovery needs, for the purpose of contributing to sustainable fisheries. With their adipose fin removed, these non-listed and surplus listed hatchery fish can be visually distinguished from listed fish requiring protection for conservation and/or recovery purposes. Exempted from take prohibitions, these adipose-fin-clipped hatchery fish can be harvested in fisheries, including but not limited to mark selective fisheries, that have appropriate ESA authorization. In addition to adipose-fin-clipped hatchery fish, other listed hatchery fish (with intact adipose fins) that are surplus to the recovery needs of an ESU and that are otherwise distinguishable from naturally spawned fish in the ESU (*e.g.*, by run timing, location, or other marking methods) may be exempted from the section 4(d) protections under the available limits. NMFS believes this approach provides needed flexibility to appropriately manage artificial

propagation and direct take of threatened salmon and *O. mykiss* for the conservation and recovery of these ESUs.

Not all hatchery stocks considered to be part of listed ESUs are of equal value for use in conservation and recovery. Certain ESU hatchery stocks may comprise a substantial portion of the genetic diversity remaining in a threatened ESU, and thus are essential assets for ongoing and future recovery efforts. If released with adipose fins intact, hatchery fish in these populations would be afforded protections under the amended 4(d) protective regulations. NMFS, however, may need to approve the take of listed hatchery stocks to manage the number of naturally spawning hatchery fish to limit potential adverse effects on the local natural population(s). Other hatchery stocks, although considered to be part of a threatened ESU, may be of limited or uncertain conservation value at the present time. Artificial propagation programs producing within-ESU hatchery populations could release adipose-fin-clipped fish, such that protections under 4(d) would not apply, and these hatchery fish could fulfill other purposes (*e.g.*, fulfilling Federal trust and tribal treaty obligations) while preserving all future recovery options. If it is later determined through ongoing recovery planning efforts that these hatchery stocks are essential for recovery, the relevant hatchery program(s) could discontinue removal of the adipose fin from all or a sufficient portion of its production as necessary to meet recovery needs.

This amendment also does not apply the take prohibitions to resident or residualized fish in salmonid ESUs, principally affecting *O. nerka* and *O. mykiss* ESUs. The kokanee (resident *O. nerka*) population that co-occurs with threatened Ozette Lake sockeye is not considered part of the ESU, and residualized sockeye are believed to be a minor components of the ESU. We believe that extending the take prohibitions to resident or residualized *O. nerka* is not necessary for the conservation and recovery of the Ozette Lake sockeye ESU. Furthermore, extending the take prohibitions to resident *O. nerka* would result in considerable confusion given the presence of a co-occurring resident kokanee population that is not listed under the ESA. We do not have sufficient information to suggest that extending the ESA take prohibitions to resident *O. mykiss* populations would confer any additional conservation benefits to listed *O. mykiss* ESUs. Rainbow trout stocks are presently being managed conservatively under state regulations in support of conserving listed steelhead, and additional conservation benefits would not be accrued by extending Federal take prohibitions to these resident populations.

Clarifying Amendments to the 4(d) Protective Regulations—Although the existing ESA section 4(d) regulations for threatened salmonids have proven effective at appropriately protecting threatened salmonid ESUs and authorizing certain activities, several of the limits described therein are redundant, outdated, or are located disjunctly in the Code of Federal Regulations (CFR). The resulting complexity of the existing 4(d) regulations unnecessarily increases the administrative and regulatory burden of managing protective regulations for threatened ESUs, and does not effectively convey to the public the specific ESUs for which certain activities may be exempted from the take prohibitions under 4(d). As part of this final rulemaking, we are clarifying the existing section 4(d) regulations for threatened salmonids so that they can be more efficiently and effectively accessed and interpreted by all affected parties. These clarifying amendments are: (1) To amend the expired 4(d) limit (§ 223.203(b)(2)), which provided a temporary exemption for ongoing research and enhancement activities with pending applications during the 2000 4(d) rulemaking, to temporarily exempt ongoing research and enhancement activities affected by the current rulemaking process; (2) to move the description of the limit for Tribal Resource Management Plans (§ 223.209) so that the text would appear next to the 4(d) rule in the CFR, improving the clarity of the 4(d) regulations; (3) to apply the amended 4(d) take prohibitions and the 14 limits promulgated in 2000 (as modified by these amendments) to the Lower Columbia River coho ESU which is newly being listed as threatened; and (4) to apply the amended 4(d) take prohibitions and the 14 limits promulgated in 2000 (as modified by these amendments) to all threatened salmon and *O. mykiss* ESUs, thus bringing them under the same 4(d) protective regulations.

Other Protective Regulations

Section 7(a)(4) of the ESA requires that Federal agencies confer with NMFS on any actions likely to jeopardize the continued existence of a species proposed for listing and on actions likely to result in the destruction or adverse modification of proposed critical habitat. For listed species, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or conduct are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a proposed Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with NMFS. Examples of Federal actions likely to affect salmon include authorized land management activities of the FS and the BLM, as well as operation of hydroelectric and storage projects of the BOR and the USACE. Such activities include timber sales and harvest, permitting livestock grazing, hydroelectric power generation, and flood control. Federal actions, including the USACE section 404 permitting activities under the Clean Water Act, USACE permitting activities under the River and Harbors Act, Federal Energy Regulatory Commission (FERC) licenses for non-Federal development and operation of hydropower, and Federal salmon hatcheries, may also require consultation.

Sections 10(a)(1)(A) and 10(a)(1)(B) of the ESA provide NMFS with authority to grant exceptions to the ESA's ''take'' prohibitions. Section 10(a)(1)(A) scientific research and enhancement permits may be issued to entities (Federal and non-Federal) conducting research that involves a directed take of listed species. A directed take refers to the intentional take of listed species. NMFS has issued section 10(a)(1)(A) research/enhancement permits for currently listed ESUs for a number of activities, including trapping and tagging, electroshocking to determine population presence and abundance, removal of fish from irrigation ditches, and collection of adult fish for artificial propagation programs. Section 10(a)(1)(B) incidental take permits may be issued to non-Federal entities performing activities which may incidentally take listed species. The types of activities potentially requiring a section 10(a)(1)(B) incidental take permit include the operation and release of artificially propagated fish by state or privately operated and funded hatcheries, state or academic research that may not incidentally take listed species and is receiving Federal authorization or funding, the implementation of state fishing regulations, logging, road building, grazing, and diverting water into private lands.

We are concerned about the potential for disruption of ongoing scientific

research, monitoring, and conservation activities, especially during the coming summer/fall field seasons. Consistent with the ''grace period for pending applications for 4(d) approval of research and enhancement activities,'' we are extending a similar grace period for pending permit applications under sections 10(a)(1)(a) and 10(a)(1)(B). The take prohibitions applicable to threatened species will not apply to activities specified in an application for a permit for scientific purposes or to enhance the conservation or survival of the species, provided that the application has been received by the NOAA Assistant Administrator for Fisheries no later than 60 days from the date of publication of this notice. This grace period for pending scientific research and enhancement applications will remain in effect until the issuance or denial of authorization, or 6 months from the date of publication of this notice, whichever occurs earliest.

Identification of Those Activities That Would Constitute a Violation of Section 9 of the ESA

NMFS and the FWS published in the **Federal Register** on July 1, 1994 (59 FR 34272), a policy that NMFS shall identify, to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the ESA. The intent of this policy is to increase public awareness of the effect of this listing on proposed and ongoing activities within the species' range. At the time of the final rule, NMFS must identify to the extent known, specific activities that will not be considered likely to result in violation of section 9, as well as activities that will be considered likely to result in violation. We believe that, based on the best available information, the following actions will not result in a violation of section 9:

1. Possession of fish from any ESU listed as threatened or endangered that are acquired lawfully by permit issued by NMFS pursuant to section 10 of the ESA, or by the terms of an incidental take statement issued pursuant to section 7 of the ESA; or

2. Federally funded or approved projects that involve activities such as silviculture, grazing, mining, road construction, dam construction and operation, discharge of fill material, stream channelization or diversion for which section 7 consultation has been completed, and when activities are conducted in accordance with any terms and conditions provided by NMFS in an incidental take statement accompanying a biological opinion.

There are many activities that we believe could potentially ''harm'' salmon, which is defined by our regulations as ''an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering'' (50 CFR 222.102 [harm]). Activities that may harm the listed ESUs, resulting in a violation of the section 9 take prohibition, include, but are not limited to:

1. Land-use activities that adversely affect habitats for any listed ESU (*e.g.*, logging, grazing, farming, urban development, road construction in riparian areas and areas susceptible to mass wasting and surface erosion);

2. Destruction/alteration of the habitats for any listed ESU, such as removal of large woody debris and ''sinker logs'' or riparian shade canopy, dredging, discharge of fill material, draining, ditching, diverting, blocking, or altering stream channels or surface or ground water flow;

3. Discharges or dumping of toxic chemicals or other pollutants (*e.g.*, sewage, oil, gasoline) into waters or riparian areas supporting listed ESUs;

4. Violation of discharge permits;

5. Application of pesticides affecting water quality or riparian areas for listed ESUs;

6. Interstate and foreign commerce of fish from any of the listed ESUs and import/export of fish from any listed ESU without a threatened or endangered species permit;

7. Collecting or handling of fish from any of the listed ESUs. Permits to conduct these activities are available for purposes of scientific research or to enhance the conservation or survival of the species; or

8. Introduction of non-native species likely to prey on fish from any listed ESU or displace them from their habitat.

These lists are not exhaustive. They are intended to provide some examples of the types of activities that might or might not be considered by NMFS as constituting a take of fish in any of the listed ESUs under the ESA and its regulations. Questions regarding whether specific activities will constitute a violation of the section 9 take prohibition, and general inquiries regarding prohibitions and permits, should be directed to NMFS (see **ADDRESSES**).

Effective Date of the Final Listing Determinations and Protective Regulations

Given the cultural, scientific, and recreational importance of West Coast salmon, and the broad geographic range of these ESUs, we recognize that numerous parties may be affected by these listing determinations and by the final amendments to the 4(d) protective regulations. Therefore, to permit an orderly implementation of the consultation requirements and take prohibitions associated with these actions, the final listings and protective regulations will take effect on August 29, 2005. The take prohibitions applicable to threatened species do not apply to activities specified in an application for a permit or 4(d) approval for scientific purposes or to enhance the conservation or survival of the species, provided that the application has been received by the Assistant Administrator for Fisheries, NOAA (AA), no later than August 29, 2005. This ''grace period'' for pending research and enhancement applications will remain in effect until the issuance or denial of authorization, or December 28, 2005, whichever occurs earliest.

Critical Habitat

Critical habitat is either designated or proposed for designation for all but one of the ESUs (the Lower Columbia River coho ESU) addressed in this **Federal Register** notice. Final critical habitat designations exist for: the Sacramento River winter-run Chinook ESU (58 FR 33212, June 16, 1993); the Snake River sockeye, spring/summer Chinook, and fall-run Chinook ESUs (58 FR 68543, December 28, 1993); and the Southern Oregon/Northern California Coasts and Central California Coast coho ESUs (64 FR 24049, May 5, 1999). Critical habitat was recently proposed for the following 20 ESUs (69 FR 71880, December 10, 2004; 69 FR 74572, December 14, 2004): Puget Sound Chinook; Lower Columbia River Chinook; Upper Willamette River Chinook ; Upper Columbia River spring-run Chinook; California Coastal Chinook; Central Valley spring-run Chinook; Oregon Coast coho; Hood Canal summer-run chum; Columbia River chum; Ozette Lake sockeye; Upper Columbia River *O. mykiss*; Snake River Basin *O. mykiss*; Middle Columbia River *O. mykiss*'; Lower Columbia River *O. mykiss*; Upper Willamette River *O. mykiss*; Northern California *O. mykiss*; Central California Coast *O. mykiss*; South-Central California Coast *O. mykiss*; Southern California *O. mykiss*; and Central Valley *O. mykiss*. In keeping with a Consent Decree and

Stipulated Order of Dismissal approved by the D.C. District Court (*Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources, Center for Biological Diversity, Oregon Natural Resources Council, Pacific Rivers Council and the Environmental Protection Information Center* v. *NMFS*, Civ. No. 031833), on or before August 15, 2005, we will submit to the **Federal Register** for publication the final rules designating critical habitat for those of the 20 ESUs identified above that are included on the lists of threatened and endangered species as of that date.

Section 4(a)(3)(A) of the ESA requires that, to the maximum extent prudent and determinable, critical habitat be designated concurrently with the listing of a species. Section 4(b)(6)(C)(ii) provides that, where critical habitat is not determinable at the time of final listing, we may extend the period for designating critical habitat by not more than one additional year. In keeping with agency regulations at 50 CFR 424.12, we conclude that critical habitat is not presently determinable for the Lower Columbia River coho ESU. Specifically, we lack biological and mapping information sufficient to perform required analyses of the impacts of critical habitat designation to determine which areas may qualify as critical habitat for this ESU. Therefore, we have decided to proceed with the final listing determination now and propose critical habitat in a separate rulemaking. In this notice we are soliciting information necessary to inform the designation of critical habitat for this ESU (see Information Solicited and **ADDRESSES**) and will consider such information in support of a future proposed designation.

Information Solicited

As noted previously, we are soliciting biological and economic information relevant to making critical habitat designations for the Lower Columbia River coho ESU. Data reviewed may include, but are not limited to, scientific or commercial publications, administrative reports, maps or other graphic materials, information received from experts, and comments from interested parties. Comments and data particularly are sought concerning:

(1) Maps and specific information describing the amount, distribution, and use type (*e.g.,* spawning, rearing, or migration) of coho salmon habitat in the lower Columbia River; as well as any additional information on occupied and unoccupied habitat areas;

(2) The reasons why any habitat should or should not be determined to be critical habitat as provided by sections 3(5)(A) and 4(b)(2) of the ESA;

(3) Information regarding the benefits of excluding lands covered by Habitat Conservation Plans (ESA section 10(a)(1)(B) permits), including the regulatory burden designation may impose on landowners and the likelihood that exclusion of areas covered by existing plans will serve as an incentive for other landowners to develop plans covering their lands;

(4) Information regarding the benefits of excluding Federal and other lands covered by habitat conservation strategies and plans (*e.g.* Northwest Forest Plan, Washington's Forest and Fish Plan, and the Oregon Plan), including the regulatory burden designation may impose on land managers and the likelihood that exclusion of areas covered by existing plans will serve as an incentive for land users to implement the conservation measures covering the lands subject to these plans;

(5) Information regarding the benefits of designating particular areas as critical habitat;

(6) Current or planned activities in the areas proposed for designation and their possible impacts on proposed critical habitat;

(7) Any foreseeable economic or other potential impacts resulting from the proposed designations, in particular, any impacts on small entities;

(8) Whether specific unoccupied areas (*e.g.*, areas behind dikes or dams) not presently proposed for designation may be essential for conservation of this ESU; and

(9) Potential peer reviewers for a proposed critical habitat designation, including persons with biological and economic expertise relevant to the designations.

NMFS seeks information regarding critical habitat for the Lower Columbia River coho ESU as soon as possible, but by no later than August 29, 2005 (see **ADDRESSES**, above).

Classification

National Environmental Policy Act

ESA listing decisions are exempt from the requirement to prepare an environmental assessment or environmental impact statement under the NEPA. See NOAA Administrative Order 216–6.03(e)(1) and *Pacific Legal Foundation* v. *Andrus*, 675 F. 2d 825 (6th Cir. 1981). Thus, we have determined that the final listing determinations for 16 ESUs of Pacific salmonids described in this notice are exempt from the requirements of the NEPA of 1969. We conducted an Environmental Assessment (EA) under the NEPA analyzing the proposed amendments to the 4(d) protective regulations for Pacific salmonids. We solicited comment on the EA as part of the proposed rule, as well as during a subsequent comment period following formal notice in the **Federal Register** of the availability of the draft EA for review. Informed by the comments received, we have finalized the EA, and issued a Finding of No Significant Impact for the amended 4(d) protective regulations.

Regulatory Flexibility Act

The Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration that the proposed rule issued under authority of ESA section 4, if adopted, would not have a significant economic impact on a substantial number of small entities. The factual basis for this certification was published with the proposed rule, and is not repeated here. No comments were received regarding that certification. As a result, no final regulatory flexibility analysis for the listing determinations or 4(d) protective regulations contained in this final rule has been prepared.

Paperwork Reduction Act (PRA)

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the PRA, unless that collection of information displays a currently valid Office of Management and Budget (OMB) Control Number.

This final rule does not contain a collection-of-information requirement for purposes of the PRA of 1980.

Executive Order (E.O.) 12866

The final listing determinations and amendments to the ESA 4(d) protective regulations addressed in this rule have been determined to be significant for the purposes of E.O. 12866. We prepared a Regulatory Impact Review which was provided to the OMB with the publication of the proposed rule.

E.O. 13084—Consultation and Coordination With Indian Tribal Governments

E.O. 13084 requires that if NMFS issues a regulation that significantly or uniquely affects the communities of Indian tribal governments and imposes substantial direct compliance costs on those communities, NMFS must consult with those governments or the Federal government must provide the funds

necessary to pay the direct compliance costs incurred by the tribal governments. This final rule does not impose substantial direct compliance costs on the communities of Indian tribal governments. Accordingly, the requirements of section 3(b) of E.O. 13084 do not apply to this proposed rule. Nonetheless, we intend to inform potentially affected tribal governments and to solicit their input and coordinate on future management actions.

E.O. 13132—Federalism

E.O. 13132 requires agencies to take into account any federalism impacts of regulations under development. It includes specific consultation directives for situations where a regulation will preempt state law, or impose substantial direct compliance costs on state and local governments (unless required by statute). Neither of those circumstances is applicable to this final rule. In fact, this notice provides mechanisms by which NMFS, in the form of 4(d) limits to take prohibitions, may defer to state and local governments where they provided necessary protections for threatened salmonids.

References

A complete list of all references cited herein is available upon request (see **ADDRESSES**), or can be obtained from the Internet at: *http://www.nwr.noaa.gov*.

List of Subjects

50 CFR Part 223

Enumeration of threatened marine and anadromous species, restrictions applicable to threatened marine and anadromous species.

50 CFR Part 224

Enumeration of endangered marine and anadromous species.

Authority: 16 U.S.C. 1531 *et seq.*

Dated: June 16, 2005.

John Oliver,

Deputy Assistant Administrator for Operations, National Marine Fisheries Service.

■ For the reasons set out in the preamble, 50 CFR parts 223 and 224 are amended as follows:

PART 223—THREATENED MARINE AND ANADROMOUS SPECIES

■ 1. The authority citation for part 223 continues to read as follows:

Authority: 16 U.S.C. 1531–1543; subpart B, § 223.12 also issued under 16 U.S.C. 1361 *et seq.*

■ 2. In § 223.102, paragraph (a) is revised to read as follows:

§ 223.102 Enumeration of threatened marine and anadromous species.

* * * * *

(a) *Marine and anadromous fish.* The following table lists the common and scientific names of threatened species, the locations where they are listed, and the citations for the listings and critical habitat designations.

Species [1]		Where Listed	Citation(s) for listing determination(s)	Citation for critical habitat designation
Common name	Scientific name			
(1) Gulf sturgeon	*Acipenser oxyrinchus desotoi*.	Everywhere	56 FR 49653, Sep. 30, 1991.	68 FR 13370, Mar. 19, 2003.
(2) Ozette Lake sockeye	*Oncorhynchus nerka*	U.S.A., WA, including all naturally spawned populations of sockeye salmon in Ozette Lake and streams and tributaries flowing into Ozette Lake, Washington, as well as two artificial propagation programs: the Umbrella Creek and Big River sockeye hatchery programs.	64 FR 14528, Mar. 25, 1999. June 28, 2005.	NA [vacated 9/29/03, 68 FR 55900].
(3) Central Valley spring-run Chinook.	*Oncorhynchus tshawytscha*.	U.S.A., CA, including all naturally spawned populations of spring-run Chinook salmon in the Sacramento River and its tributaries in California, including the Feather River, as well as the Feather River Hatchery spring-run Chinook program.	64 FR 50394, Sep. 16, 1999. June 28, 2005.	NA [vacated 9/29/03, 68 FR 55900].
(4) California Coastal Chinook.	*Oncorhynchus tshawytscha*.	U.S.A., CA, including all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River to the Russian River, California, as well as seven artificial propagation programs: the Humboldt Fish Action Council (Freshwater Creek), Yager Creek, Redwood Creek, Hollow Tree, Van Arsdale Fish Station, Mattole Salmon Group, and Mad River Hatchery fall-run Chinook hatchery programs.	64 FR 50394, Sep. 16, 1999. June 28, 2005.	NA [vacated 9/29/03, 68 FR 55900].

Species [1]		Where Listed	Citation(s) for listing determination(s)	Citation for critical habitat designation
Common name	Scientific name			
(5) Upper Willamette River Chinook.	*Oncorhynchus tshawytscha*.	U.S.A., OR, including all naturally spawned populations of spring-run Chinook salmon in the Clackamas River and in the Willamette River, and its tributaries, above Willamette Falls, Oregon, as well as seven artificial propagation programs: the McKenzie River Hatchery (Oregon Department of Fish and Wildlife (ODFW) stock #24), Marion Forks/North Fork Santiam River (ODFW stock #21), South Santiam Hatchery (ODFW stock #23) in the South Fork Santiam River, South Santiam Hatchery in the Calapooia River, South Santiam Hatchery in the Mollala River, Willamette Hatchery (ODFW stock #22), and Clackamas hatchery (ODFW stock #19) spring-run Chinook hatchery programs.	64 FR 14308, Mar. 24, 1999. June 28, 2005.	NA [vacated 9/29/03, 68 FR 55900].
(6) Lower Columbia River Chinook.	*Oncorhynchus tshawytscha*.	U.S.A., OR, WA, including all naturally spawned populations of Chinook salmon from the Columbia River and its tributaries from its mouth at the Pacific Ocean upstream to a transitional point between Washington and Oregon east of the Hood River and the White Salmon River, and includes the Willamette River to Willamette Falls, Oregon, exclusive of spring-run Chinook salmon in the Clackamas River, as well as seventeen artificial propagation programs: the Sea Resources Tule Chinook Program, Big Creek Tule Chinook Program, Astoria High School (STEP) Tule Chinook Program, Warrenton High School (STEP) Tule Chinook Program, Elochoman River Tule Chinook Program, Cowlitz Tule Chinook Program, North Fork Toutle Tule Chinook Program, Kalama Tule Chinook Program, Washougal River Tule Chinook Program, Spring Creek NFH Tule Chinook Program, Cowlitz spring Chinook Program in the Upper Cowlitz River and the Cispus River, Friends of the Cowlitz spring Chinook Program, Kalama River spring Chinook Program, Lewis River spring Chinook Program, Fish First spring Chinook Program, and the Sandy River Hatchery (ODFW stock #11) Chinook hatchery programs.	64 FR 14308, Mar. 24, 1999. June 28, 2005.	NA [vacated 9/29/03, 68 FR 55900].

Species [1]		Where Listed	Citation(s) for listing determination(s)	Citation for critical habitat designation
Common name	Scientific name			
(7) Puget Sound Chinook	*Oncorhynchus tshawytscha*.	U.S.A., WA, including all naturally spawned populations of Chinook salmon from rivers and streams flowing into Puget Sound including the Straits of Juan De Fuca from the Elwha River, eastward, including rivers and streams flowing into Hood Canal, South Sound, North Sound and the Strait of Georgia in Washington, as well as twenty-six artificial propagation programs: the Kendal Creek Hatchery, Marblemount Hatchery (fall, spring yearlings, spring subyearlings, and summer run), Harvey Creek Hatchery, Whitehorse Springs Pond, Wallace River Hatchery (yearlings and subyearlings), Tulalip Bay, Issaquah Hatchery, Soos Creek Hatchery, Icy Creek Hatchery, Keta Creek Hatchery, White River Hatchery, White Acclimation Pond, Hupp Springs Hatchery, Voights Creek Hatchery, Diru Creek, Clear Creek, Kalama Creek, George Adams Hatchery, Rick's Pond Hatchery, Hamma Hamma Hatchery, Dungeness/Hurd Creek Hatchery, Elwha Channel Hatchery Chinook hatchery programs.	64 FR 14308, Mar. 24, 1999. June 28, 2005.	NA [vacated 9/29/03, 68 FR 55900].
(8) Snake River fall-run Chinook.	*Oncorhynchus tshawytscha*.	U.S.A., OR, WA, ID, including all naturally spawned populations of fall-run Chinook salmon in the mainstem Snake River below Hells Canyon Dam, and in the Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River, as well as four artificial propagation programs: the Lyons Ferry Hatchery, Fall Chinook Acclimation Ponds Program, Nez Perce Tribal Hatchery, and Oxbow Hatchery fall-run Chinook hatchery programs.	57 FR 14653, Apr. 22, 1992, 57 FR 23458, Jun. 3, 1992. June 28, 2005.	58 FR 68543, Dec. 28, 1993.
(9) Snake River spring/summer-run Chinook.	*Oncorhynchus tshawytscha*.	U.S.A., OR, WA, ID, including all naturally spawned populations of spring/summer-run Chinook salmon in the mainstem Snake River and the Tucannon River, Grande Ronde River, Imnaha River, and Salmon River subbasins, as well as fifteen artificial propagation programs: the Tucannon River conventional Hatchery, Tucannon River Captive Broodstock Program, Lostine River, Catherine Creek, Lookingglass Hatchery, Upper Grande Ronde, Imnaha River, Big Sheep Creek, McCall Hatchery, Johnson Creek Artificial Propagation Enhancement, Lemhi River Captive Rearing Experiment, Pahsimeroi Hatchery, East Fork Captive Rearing Experiment, West Fork Yankee Fork Captive Rearing Experiment, and the Sawtooth Hatchery spring/summer-run Chinook hatchery programs.	57 FR 14653, Apr. 22, 1992, 57 FR 23458, Jun. 3, 1992. June 28, 2005	58 FR 68543, Dec. 28, 1993. 64 FR 57399, Oct. 25, 1999.
(10) Southern Oregon/Northern California Coast coho.	*Oncorhynchus kisutch* ...	U.S.A., CA, OR, including all naturally spawned populations of coho salmon in coastal streams between Cape Blanco, Oregon, and Punta Gorda, California, as well three artificial propagation programs: the Cole Rivers Hatchery (ODFW stock #52), Trinity River Hatchery, and Iron Gate Hatchery coho hatchery programs.	62 FR 24588, May 6, 1997. June 28, 2005.	64 FR 24049, May 5, 1999.

Species [1]		Where Listed	Citation(s) for listing determination(s)	Citation for critical habitat designation
Common name	Scientific name			
(11) Lower Columbia River coho.	*Oncorhynchus kisutch* ...	U.S.A., OR, WA, including all naturally spawned populations of coho salmon in the Columbia River and its tributaries in Washington and Oregon, from the mouth of the Columbia up to and including the Big White Salmon and Hood Rivers, and includes the Willamette River to Willamette Falls, Oregon, as well as twenty-five artificial propagation programs: the Grays River, Sea Resources Hatchery, Peterson Coho Project, Big Creek Hatchery, Astoria High School (STEP) Coho Program, Warrenton High School (STEP) Coho Program, Elochoman Type-S Coho Program, Elochoman Type-N Coho Program, Cathlamet High School FFA Type-N Coho Program, Cowlitz Type-N Coho Program in the Upper and Lower Cowlitz Rivers, Cowlitz Game and Anglers Coho Program, Friends of the Cowlitz Coho Program, North Fork Toutle River Hatchery, Kalama River Type-N Coho Program, Kalama River Type-S Coho Program, Lewis River Type-N Coho Program, Lewis River Type-S Coho Program, Fish First Wild Coho Program, Fish First Type-N Coho Program, Syverson Project Type-N Coho Program, Eagle Creek National Fish Hatchery, Sandy Hatchery, and the Bonneville/Cascade/Oxbow complex coho hatchery programs.	June 28, 2005.	NA
(12) Columbia River chum.	*Oncorhynchus keta*	U.S.A., OR, WA, including all naturally spawned populations of chum salmon in the Columbia River and its tributaries in Washington and Oregon, as well as three artificial propagation programs: the Chinook River (Sea Resources Hatchery), Grays River, and Washougal River/Duncan Creek chum hatchery programs.	64 FR 14508, Mar. 25, 1999. June 28, 2005.	NA [vacated 9/29/03, 68 FR 55900].
(13) Hood Canal summer-run chum.	*Oncorhynchus keta*	U.S.A., WA, including all naturally spawned populations of summer-run chum salmon in Hood Canal and its tributaries as well as populations in Olympic Peninsula rivers between Hood Canal and Dungeness Bay, Washington, as well as eight artificial propagation programs: the Quilcene NFH, Hamma Hamma Fish Hatchery, Lilliwaup Creek Fish Hatchery, Union River/Tahuya, Big Beef Creek Fish Hatchery, Salmon Creek Fish Hatchery, Chimacum Creek Fish Hatchery, and the Jimmycomelately Creek Fish Hatchery summer-run chum hatchery programs.	64 FR 14508, Mar. 25, 1999. June 28, 2005.	NA [vacated 9/29/03, 68 FR 55900].
(14) South-Central California Coast Steelhead.	*Oncorhynchus mykiss*	U.S.A., CA, including all naturally spawned populations of steelhead (and their progeny) in streams from the Pajaro River (inclusive), located in Santa Cruz County, California, to (but not including) the Santa Maria River.	62 FR 49397, Aug. 18, 1997.	NA [vacated 9/29/03, 68 FR 55900].

Species [1]		Where Listed	Citation(s) for listing determination(s)	Citation for critical habitat designation
Common name	Scientific name			
(15) Central California Coast Steelhead.	*Oncorhynchus mykiss*	U.S.A., CA, including all naturally spawned populations of steelhead (and their progeny) in streams from the Russian River to Aptos Creek, Santa Cruz County, Californian (inclusive), and the drainages of San Francisco and San Pablo Bays eastward to the Napa River (inclusive), Napa County, California. Excludes the Sacramento- San Joaquin River Basin of the Central Valley of California.	62 FR 43937, Aug. 18, 1997.	NA [vacated 9/29/03, 68 FR 55900].
(16) California Central Valley Steelhead.	*Oncorhynchus mykiss*	U.S.A., CA, including all naturally spawned populations of steelhead (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries.	63 FR 13347; Mar. 19, 1998.	NA [vacated 9/29/03, 68 FR 55900].
(17) Northern California Steelhead.	*Oncorhynchus mykiss*	U.S.A., CA, including all naturally spawned populations of steelhead (and their progeny) in California coastal river basins from Redwood Creek in Humboldt County, California, to the Gualala River, inclusive, in Mendocino County, California.	65 FR 36074, June 7, 2000.	NA
(18) Upper Willamette River Steelhead.	*Oncorhynchus mykiss*	U.S.A., OR, including all naturally spawned populations of winter-run steelhead in the Willamette River, Oregon, and its tributaries upstream from Willamette Falls to the Calapooia River, inclusive.	62 FR 43937, Aug. 18, 1997.	NA [vacated 9/29/03, 68 FR 55900].
(19) Lower Columbia River Steelhead.	*Oncorhynchus mykiss*	U.S.A., OR, WA, including all naturally spawned populations of steelhead (and their progeny) in streams and tributaries to the Columbia River between the Cowlitz and Wind Rivers, Washington, inclusive, and the Willamette and Hood Rivers, Oregon, inclusive. Excluded are steelhead in the upper Willamette River Basin above Willamette Falls, Oregon, and from the Little and Big White Salmon Rivers, Washington.	62 FR 13347, Mar. 19, 1998.	NA [vacated 9/29/03, 68 FR 55900].
(20) Middle Columbia River Steelhead.	*Oncorhynchus mykiss*	U.S.A., OR, WA, including all naturally spawned populations of steelhead in streams from above the Wind River, Washington, and the Hood River, Oregon (exclusive), upstream to, and including, the Yakima River, Washington. Excluded are steelhead from the Snake River Basin.	57 FR 14517, Mar. 25, 1999.	NA [vacated 9/29/03, 68 FR 55900].
(21) Snake River Basin Steelhead.	*Oncorhynchus mykiss*	U.S.A., OR, WA, ID, including all naturally spawned populations of steelhead (and their progeny) in streams in the Snake River Basin of southeast Washington, northeast Oregon, and Idaho.	62 FR 43937, Aug. 18, 1997.	NA [vacated 9/29/03, 68 FR 55900].

[1] Species includes taxonomic species, subspecies, distinct population segments (DPSs) (for a policy statement, see 61 FR 4722, February 7, 1996), and evolutionarily significant units (ESUs) (for a policy statement, see 56 FR 58612, November 20, 1991).

■ 3. In § 223.203, paragraphs (a), (b) introductory text, and (b)(2) are revised and paragraphs (b)(14) through (22) are removed.

The revisions read as follows:

§ 223.203 Anadromous fish.

(a) *Prohibitions.* The prohibitions of section 9(a)(1) of the ESA (16 U.S.C. 1538(a)(1)) relating to endangered species apply to anadromous fish with an intact adipose fin that are part of the threatened species of salmonids listed in § 223.102(a)(2) through (a)(21).

* * * * *

(b) *Limits on the prohibitions.* The limits to the prohibitions of paragraph (a) of this section relating to threatened species of salmonids listed in § 223.102(a) are described in the following paragraphs (b)(1) through (b)(13):

* * * * *

(2) The prohibitions of paragraph (a) of this section relating to threatened species of salmonids listed in § 223.102(a)(2) through (a)(21) do not apply to activities specified in an application for 4(d) authorization for scientific purposes or to enhance the

conservation or survival of the species, provided that the application has been received by the Assistant Administrator for Fisheries, NOAA (AA), no later than August 29, 2005. The prohibitions of this section apply to these activities upon the AA's rejection of the application as insufficient, upon issuance or denial of authorization, or December 28, 2005, whichever occurs earliest.

* * * * *

§ 223.203 [Amended]

■ 4. In § 223.203, paragraphs (b)(1) through (b)(13), and (c), the references in the sections listed in the first column below are revised according to the directions in the second and third columns.

Section	Remove	Add
§ 223.203(b)(1)	§ 223.102(a)(1) through (a)(10), and (a)(12) through (a)(22)	§ 223.102(a)(2) through (a)(21).
§ 223.203(b)(3)	§ 223.102(a)(4) through (a)(10), and (a)(12) through (a)(19)	§ 223.102(a)(2) through (a)(21).
§ 223.203(b)(4)	§ 223.102(a)(5) through (a)(10), and (a)(12) through (a)(19)	§ 223.102(a)(2) through (a)(21).
§ 223.203(b)(5)	§ 223.102(a)(5) through (a)(10), and (a)(12) through (a)(19)	§ 223.102(a)(2) through (a)(21).
§ 223.203(b)(6)	§ 223.102(a)(7), (a)(8), (a)(10), and (a)(12) through (a)(19)	§ 223.102(a)(2) through (a)(21).
§ 223.203(b)(7)	§ 223.102(a)(5) through (a)(10), and (a)(12) through (a)(19)	§ 223.102(a)(2) through (a)(21).
§ 223.203(b)(8)	§ 223.102(a)(5) through (a)(10), and (a)(12) through (a)(19)	§ 223.102(a)(2) through (a)(21).
§ 223.203(b)(9)	§ 223.102(a)(5) through (a)(10), and (a)(12) through (a)(19)	§ 223.102(a)(2) through (a)(21).
§ 223.203(b)(10)	§ 223.102(a)(5) through (a)(10), and (a)(12) through (a)(19)	§ 223.102(a)(2) through (a)(21).
§ 223.203(b)(11)	§ 223.102(a)(5) through (a)(10), and (a)(12) through (a)(19)	§ 223.102(a)(2) through (a)(21).
§ 223.203(b)(12)	§ 223.102(a)(5) through (a)(10), and (a)(12) through (a)(19)	§ 223.102(a)(2) through (a)(21).
§ 223.203(b)(13)	§ 223.102(a)(12), (a)(13), (a)(16), (a)(17), and (a)(19)	§ 223.102(a)(2) through (a)(22).
§ 223.203(c)	§ 223.102(a)(3), (a)(5) through (a)(10), and (a)(12) through (a)(22)	§ 223.102(a)(2) through (a)(21).
§ 223.203(c)	§ 223.209(a)	§ 223.204(a).

§ 223.204 [Removed]

■ 5. Remove § 223.204.

§ 223.209 [Redesignated as § 223.204]

■ 6. Redesignate § 223.209 as § 223.204, and add and reserve new § 223.209.

PART 224—ENDANGERED MARINE AND ANADROMOUS SPECIES

■ 7. The authority citation for part 224 continues to read as follows:

Authority: 16 U.S.C. 1531–1543 and 16 U.S.C. 1361 *et seq.*

■ 8. Revise § 224.101(a) to read as follows:

§ 224.101 Enumeration of endangered marine and anadromous species.

* * * * *

(a) *Marine and anadromous fish.* The following table lists the common and scientific names of endangered species, the locations where they are listed, and the citations for the listings and critical habitat designations.

Species [1]		Where listed	Citation(s) for listing determination(s)	Citation for critical habitat designation
Common name	Scientific name			
Shortnose sturgeon	*Acipenser brevirostrum*	Everywhere	32 FR 4001, Mar. 11, 1967.	NA.
Smalltooth sawfish	*Pristis pectinata*	U.S.A.	68 FR 15674, Apr. 1, 2003.	NA.
Totoaba	*Cynoscion macdonaldi*	Everywhere	44 FR 29480, May 21, 1979.	NA.
Atlantic salmon	*Salmon salar*	U.S.A., ME, Gulf of Maine population, which includes all naturally reproducing populations and those river-specific hatchery populations cultured from them.	65 FR 69459, Nov. 17, 2000.	NA.
Snake River sockeye	*Oncorhynchus nerka*	U.S.A., ID, including all anadromous and residual sockeye salmon from the Snake River Basin, Idaho, as well as artificially propagated sockeye salmon from the Redfish Lake captive propagation program.	56 FR 58619, Nov. 20, 1991. June 28, 2005.	58 FR 68543, Dec. 28, 1993.
Sacramento River winter-run Chinook.	*Oncorhynchus tshawytscha.*	U.S.A., CA, including all naturally spawned populations of winter-run Chinook salmon in the Sacramento River and its tributaries in California, as well as two artificial propagation programs: winter-run Chinook from the Livingston Stone National Fish Hatchery (NFH), and winter run Chinook in a captive broodstock program maintained at Livingston Stone NFH and the University of California Bodega Marine Laboratory.	52 FR 6041; Feb. 27, 1987, 55 FR 49623; Nov. 30, 1990. 59 FR 440; Jan. 1, 1994. June 28, 2005.	58 FR 33212, June 16, 1993.

Species [1]		Where listed	Citation(s) for listing determination(s)	Citation for critical habitat designation
Common name	Scientific name			
Upper Columbia spring-run Chinook.	*Oncorhynchus tshawytscha*.	U.S.A., WA, including all naturally spawned populations of Chinook salmon in all river reaches accessible to Chinook salmon in Columbia River tributaries upstream of the Rock Island Dam and downstream of Chief Joseph Dam in Washington (excluding the Okanogan River), the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to Chief Joseph Dam in Washington, as well as six artificial propagation programs: the Twisp River, Chewuch River, Methow Composite, Winthrop NFH, Chiwawa River, and White River spring-run Chinook hatchery programs.	64 FR 14308, Mar. 24, 1999. June 28, 2005.	NA. [vacated 9/29/03; 68 FR 55900].
Central California Coast coho.	*Oncorhynchus kisutch* ...	U.S.A., CA, including all naturally spawned populations of coho salmon from Punta Gorda in northern California south to and including the San Lorenzo River in central California, as well as populations in tributaries to San Francisco Bay, excluding the Sacramento-San Joaquin River system, as well four artificial propagation programs: the Don Clausen Fish Hatchery Captive Broodstock Program, Scott Creek/King Fisher Flats Conservation Program, Scott Creek Captive Broodstock Program, and the Noyo River Fish Station egg-take Program coho hatchery programs.	61 FR 56138, Oct. 31, 1996. June 28, 2005.	64 FR 24049, May 5, 1999.
Southern California Steelhead.	*Oncorhynchus mykiss*	U.S.A., CA, including all naturally spawned populations of steelhead (and their progeny), in streams from the Santa Maria River, San Luis Obispo County, California, (inclusive) to the United States—Mexico Border.	62 FR 43937, Aug. 18, 1997. 67 FR 21586, May 1, 2002.	NA. [vacated 9/29/03; 68 FR 55900].
Upper Columbia River Steelhead.	*Oncorhynchus mykiss*	U.S.A., WA, including the Wells Hatchery stock all naturally spawned populations of steelhead (and their progeny) in streams in the Columbia River Basin upstream from the Yakima River, Washington, to the United States-Canada border.	62 FR 43937, Aug. 18, 1997.	NA. [vacated 9/29/03, 68 FR 55900].

[1] Species includes taxonomic species, subspecies, distinct population segments (DPSs) (for a policy statement, see 61 FR 4722, February 7, 1996), and evolutionarily significant units (ESUs) (for a policy statement, see 56 FR 58612, November 20, 1991).

* * * * *

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Parts 223 and 224

[Docket No. 040511148–5151–02; I.D. 050304B]

Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead

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

ACTION: Final policy.

SUMMARY: We, the National Marine Fisheries Service (NMFS), announce a final policy addressing the role of artificially propagated (hatchery produced) Pacific salmon (*Oncorhynchus gorbuscha*, *O. keta*, *O. kisutch*, *O. nerka*, *O. tshawytscha*) and steelhead (*O. mykiss*) in listing determinations under the Endangered Species Act of 1973 (ESA), as amended. This final policy supersedes the Interim Policy on Artificial Propagation of Pacific Salmon under the Endangered