Upper Columbia River spring-run Chinook salmon ESU; (3) Snake River spring/summer-run Chinook salmon ESU; (4) Central Valley spring-run Chinook salmon ESU; (5) California Coastal Chinook salmon ESU; (6) Puget Sound Chinook salmon ESU; (7) Lower Columbia River Chinook salmon ESU; (8) Upper Willamette River Chinook salmon ESU; (9) Hood Canal summer-run chum salmon ESU; (10) Columbia River chum salmon ESU; (11) Central California Coast coho salmon ESU; (12) Southern Oregon/Northern California Coast coho salmon ESU; (13) Lower Columbia River coho salmon ESU; (14) Oregon Coast coho salmon ESU; (15) Snake River sockeye salmon ESU; (16) Ozette Lake sockeye salmon ESU; (17) Southern California steelhead DPS; (18) Upper Columbia River steelhead DPS; (19) Middle Columbia River steelhead DPS; (20) Snake River Basin steelhead DPS; (21) Lower Columbia River steelhead DPS; (22) Upper Willamette River steelhead DPS; (23) South-Central California Coast steelhead DPS; (24) Central California Coast steelhead DPS; (25) Northern California steelhead DPS; (26) California Central Valley steelhead DPS; (27) Puget Sound steelhead DPS; and (28) the southern DPS of eulachon.

On January 16, 2015, we received a petition from the Chinook Futures Coalition to delist the Snake River fall-run Chinook ESU under the ESA. On April 22, 2015, we published a positive 90-day finding (80 FR 22468) that the petition presented substantial scientific or commercial information indicating that the petitioned action may be warranted, and we announced the initiation of a status review. While the Snake River fall-run Chinook salmon ESU was included as part of our 5-year reviews of West Coast salmon and steelhead, the results of our review of Snake River fall-run Chinook salmon and our finding on the delisting petition are addressed in a separate notice in this issue of the **Federal Register**. The 5-year review findings for the three Puget Sound/Georgia Basin DPSs of yelloweye rockfish, canary rockfish, and bocaccio rockfish will be announced separately on our Web site: *http://www.westcoast.fisheries.noaa.gov.*

We used a multi-step process to complete the subject 5-year review. First, we asked scientists from NMFS' Northwest and Southwest Fisheries Science Centers to collect and analyze new information about species viability. To evaluate species viability, our scientists evaluate four criteria—abundance, productivity, spatial structure, and diversity. They also considered new genetic and biogeographic information regarding species' ranges. At the end of this process, the Northwest and Southwest Fisheries Science Centers prepared two reports detailing the results of their analyses.

Next, biologists from the NMFS West Coast Region with expertise in salmonid hatchery management conducted a review of all West Coast salmonid hatchery programs associated with the ESA-listed salmon and steelhead. Their evaluation was guided by NMFS' Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead (Hatchery Listing Policy) (70 FR 37204; June 28, 2005). A memorandum (Jones 2015) summarizes their evaluation of the relatedness of related hatchery stocks relative to the local natural populations to determine if the stocks warrant inclusion as part of the respective ESA listings.

Finally, we formed geographically-based teams of salmon and eulachon management biologists from our West Coast Region to evaluate information related to the five ESA section 4(a)(1) listing factors. These section 4(a)(1) factors are: (1) The present or threatened destruction, modification, or curtailment of the species' 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 man-made factors affecting the species' continued existence. These teams produced ''5-Year Review Reports'' that incorporate the findings of the Northwest and Southwest Fisheries Science Centers' reports, summarize new information concerning the delineation of the subject ESUs and DPSs and inclusion of closely related salmonid hatchery programs, and detail the evaluation of the ESA section 4(a)(1) listing factors. The Northwest and Southwest Fisheries Science Centers' reports, the 5-year review reports, and additional information are available on our Web site: *http://www.westcoast.fisheries.noaa.gov.*

Findings

After considering the best available information, we conclude that the 17 Pacific salmon ESUs, the 10 steelhead DPSs, and the southern DPS of eulachon detailed above shall remain listed as currently classified.

We also conclude that, based on the best information available, no adjustments to the species' ranges are necessary. We did conclude that the species membership of several salmonid hatchery programs will need to be revised. We will adjust the hatchery memberships through a subsequent rulemaking.

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

Dated: May 23, 2016.

Angela Somma,

Chief, Endangered Species Division, Office of Protected Resources, National Marine Fisheries Service.

[FR Doc. 2016–12454 Filed 5–25–16; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[Docket No. 150211136–6422–02]

RIN 0648–XD769

Endangered and Threatened Wildlife and Plants; Notice of 12-Month Finding on a Petition To Delist the Snake River Fall-Run Chinook Salmon Evolutionarily Significant Unit Under the Endangered Species Act (ESA)

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

ACTION: Notice of 12-month finding and availability of 5-year reviews.

SUMMARY: We, NMFS, announce a 12-month finding on a petition to delist the Snake River fall-run Chinook salmon (*Oncorhynchus tshawytscha*) (Snake River fall-run Chinook) Evolutionarily Significant Unit (ESU) under the Endangered Species Act (ESA). The Snake River fall-run Chinook ESU was listed as threatened under the ESA in 1992. We have completed a comprehensive review of the status of the species in response to the petition. Based on the best scientific and commercial data available, we have determined that delisting of the Snake River fall-run Chinook ESU is not warranted at this time. We conclude that the Snake River fall-run Chinook is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, and will remain listed as a threatened species under the ESA. We also announce the availability of 5-year reviews, prepared pursuant to ESA, for four Snake River salmonid species: The Snake River fall-run Chinook ESU, the Snake River sockeye salmon ESU, the Snake River spring/summer Chinook salmon ESU, and the Snake River steelhead distinct population segment (DPS). We combined our evaluations and findings for these four species into a joint report. This 5-Year Review Report determined that the four Snake

River salmon species, including the Snake River fall-run Chinook ESU, should retain their current listed status under the ESA.

DATES: This finding was made on May 26, 2016.

ADDRESSES: The documents informing the 12-month finding are available electronically at: *http://www.westcoast.fisheries.noaa.gov/.* You may also receive copies of these documents by submitting a request to the Protected Resources Division, West Coast Region, NMFS, 1201 NE Lloyd Boulevard, Suite 1100, Portland, OR 97232, Attention: Snake River fall-run Chinook 12-month Finding.

FOR FURTHER INFORMATION CONTACT: Dr. Scott Rumsey, NMFS West Coast Region at (503) 872–2791; or Maggie Miller, NMFS Office of Protected Resources at (301) 427–8403.

SUPPLEMENTARY INFORMATION:

Background

The Snake River fall-run Chinook ESU was listed as threatened under the ESA in 1992 (57 FR 14658; April 22, 1992). We have twice affirmed that the Snake River fall-run Chinook ESU should remain classified as a ''threatened'' species under the ESA following reviews of the species' status in 2005 (70 FR 37160; June 28, 2005) and again in 2011 (76 FR 50448; August 15, 2011). On January 16, 2015, we received a petition from the Chinook Futures Coalition to delist the Snake River fall-run Chinook ESU under the ESA. Separately, on February 6, 2015, we published a notice of initiation of 5-year reviews, as required by ESA section 4(c)(2)(A), for 32 West Coast marine and anadromous ESA-listed species, including the Snake River fall-run Chinook ESU, and requested information from the public to inform our reviews (80 FR 6695; February 6, 2015). On April 22, 2015, we published a positive 90-day finding (80 FR 22468) that the Snake River fall-run Chinook ESU delisting petition presented substantial scientific or commercial information indicating that the petitioned action may be warranted. As required by ESA section 4(b)(3)(A), our April 22, 2015 finding announced the initiation of a status review to determine whether the petitioned action was warranted and invited the public to submit scientific and commercial information to inform our review. We explained that any information submitted to inform the 5-year review for Snake River fall-run Chinook ESU would also be considered in making our 12-month finding for that species.

Listing Species Under the Endangered Species Act

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.'' 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 of any species of vertebrate fish or wildlife which interbreeds when mature.'' For identifying species of Pacific steelhead, we apply the joint NMFS–U.S. Fish and Wildlife Service (USFWS) Policy Regarding the Recognition of Distinct Vertebrate Population Segments under the Endangered Species Act (DPS Policy) (61 FR 4722; February 7, 1996). Under the DPS Policy, we consider two elements in evaluating whether a vertebrate population segment qualifies as a DPS, and consequently a 'species,' under the ESA: (1) Discreteness of the population segment in relation to the remainder of the species/taxon, and, if discrete; (2) the significance of the population segment to the species/taxon. For Pacific salmon, we apply our Policy on Applying the Definition of Species under the Endangered Species Act to Pacific Salmon (ESU Policy) in identifying species (56 FR 58612; November 20, 1991). Per the ESU Policy, to qualify as a DPS, a Pacific salmon population or group of populations must be substantially reproductively isolated and represent an important component in the evolutionary legacy of the biological species. A population meeting these criteria is considered to be an ''evolutionarily significant unit'' (ESU), and hence a ''species,'' under the ESA (56 FR 58612).

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. Section 4(a)(1) of the ESA and NMFS' implementing regulations (50 CFR part 424) also states that we must determine whether a species is endangered or threatened because of any one or a combination of the following five factors: (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) inadequacy of existing regulatory mechanisms; or (E) other natural or man-made factors affecting its continued existence. A species may be removed from the list if the Secretary of Commerce determines, based on the best scientific and commercial data available and after conducting a review of the species' status, that the species is no longer threatened or endangered because of one or a combination of the section 4(a)(1) factors. Pursuant to our regulations at 50 CFR 424.11(d), a species may be delisted only if such data substantiate that it is neither endangered nor threatened for one or more of the following reasons:

(1) *Extinction.* Unless all individuals of the listed species had been previously identified and located, and were later found to be extirpated from their previous range, a sufficient period of time must be allowed before delisting to indicate clearly that the species is extinct.

(2) *Recovery.* The principal goal of the ESA is to return listed species to a point at which protection under the ESA is no longer required. A species may be delisted on the basis of recovery only if the best scientific and commercial data available indicate that it is no longer endangered or threatened.

(3) *Original data for classification in error.* Subsequent investigations may show that the best scientific or commercial data available when the species was listed, or the interpretation of such data, were in error.

ESA Section 4 Status Reviews

Section 4(c)(2)(A) of the ESA requires that we conduct a review of the status of each listed species under our jurisdiction at least once every 5 years (5-year reviews). In conducting 5-year reviews, we consider the best scientific and commercial data available to determine whether any species should be: (1) Delisted; (2) changed in status from endangered to threatened; or (3) changed in status from threatened to endangered. On February 6, 2015, we published a notice of initiation of 5-year reviews for West Coast ESA-listed species, including the Snake River fall-run Chinook ESU (80 FR 6695; February 6, 2015), and solicited information to inform the 5-year reviews during a 90-day public comment period.

Section 4(b)(3) of the ESA requires that, when NMFS makes a positive 90-day finding on a petition to list or delist a species, we must promptly commence a review of the status of the species concerned. As part of our April 22,

2015, positive 90-day finding on the subject delisting petition, we announced the initiation of a status review of the Snake River fall-run Chinook ESU and solicited information to inform that review during a 60-day public comment period (80 FR 22468). We explained in our April 22, 2015 notice that we would consider all information received in response to either the 5-year review or positive 90-day finding requests for information in making our 12-month finding for Snake River fall-run Chinook ESU. In response to these requests for information, we received information from Federal and state agencies, Native American Tribes, conservation organizations, fishing and industry groups, and individuals. This information, as well as other information routinely collected by our agency, informed our status review of the Snake River fall-run Chinook ESU, as well as the 5-year reviews of the other Snake River species.

To realize efficiencies and to ensure that our reviews were based on the best scientific and commercial information available, we integrated our section 4(b)(3)(B) status review and our section 4(c)(2)(A) 5-year review of the Snake River fall-run Chinook ESU. We also consolidated our 5-year reviews of the four listed Snake River salmonid species into a joint report. We used a multi-step process to complete these reviews. First, scientists from our Northwest Fisheries Science Center collected and analyzed information about the viability of the Pacific Northwest salmon ESUs and steelhead DPSs undergoing 5-year reviews, including the Snake River salmon ESUs and steelhead DPS. As part of Northwest Fisheries Science Center's review, the scientists also evaluated life-history, genetic, and other information that might inform a reconsideration of the delineation of the salmon ESUs and steelhead DPSs. At the end of this process, the Northwest Fisheries Science Center prepared a report detailing the results of their analyses (NWFSC 2015).

Next, biologists from NMFS' West Coast Region with expertise in hatchery management conducted a review of all West Coast salmonid hatchery programs associated with the ESA-listed salmon and steelhead. Their evaluation was guided by NMFS' Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead (Hatchery Listing Policy) (70 FR 37204; June 28, 2005). Under the Hatchery Listing Policy, we consider hatchery stocks to be part of an ESU/DPS if they exhibit a level of genetic divergence relative to the local natural population(s) that is no more than what occurs within the ESU (70 FR 37204; 37215). A memorandum (Jones 2015) summarizes their evaluation of the relatedness of hatchery stocks relative to the local natural populations to determine if the stocks warrant inclusion as part of the respective ESA listings (see the ''Delineation of Species'' section, below).

Finally, we formed geographically-based teams of salmon management biologists from our West Coast Region to evaluate information related to the five ESA section 4(a)(1) factors. These teams produced ''5-Year Review Reports'' that incorporate the findings of the Northwest Fisheries Science Center's report, summarize new information concerning the delineation of the subject ESUs and DPSs and inclusion of closely related hatchery programs, and detail the evaluation of the ESA section 4(a)(1) factors. An evaluation team conducted the review for the four ESA-listed salmon and steelhead species in the Snake River Basin and consolidated its evaluation and findings for these four species in a joint Snake River 5-Year Review Report (NMFS 2016).

Separately, on November 2, 2015, we announced the availability of the proposed recovery plan for Snake River fall-run Chinook salmon (Proposed Recovery Plan) for public review and comment (80 FR 67386). On December 17, 2015, we announced a 30-day extension of the public comment period on the Proposed Recovery Plan (80 FR 78719). The Proposed Recovery Plan (NMFS 2015) includes an appendix (Appendix A) detailing a viability assessment for the Snake River fall-run Chinook ESU. Because the ESA section 4(b)(3)(B) status review for the Snake River fall-run Chinook ESU and the ESA section 4(c)(2)(A) 5-year reviews for all of the Snake River ESA-listed salmon and steelhead species were underway at the time the Proposed Recovery Plan was released, the viability assessment in Appendix A incorporated the available materials and analyses from the ongoing reviews. The results of the viability assessment detailed in Appendix A are incorporated in the Northwest Fisheries Science Center's report (NWFSC 2015). This 12-month finding relies upon the information presented in the Proposed Recovery Plan's viability assessment (NMFS 2015, Appendix A), the Northwest Fisheries Science Center's report (NWFSC 2015), the review of West Coast salmonid hatchery programs (Jones 2015), the Snake River 5-year Review Report (NMFS 2016), as well as pertinent information submitted as part of the public comment periods that was not otherwise incorporated in the aforementioned documents. These documents are available at our West Coast Region's Web site (see **ADDRESSES**, above).

Petition Finding

Section 4(b)(3)(B) of the ESA requires us to make a finding within 12-months of the date of receipt of any petition that was found to present substantial information indicating that the petitioned action may be warranted. The 12-month finding must provide a determination of whether the petitioned action is: (a) Not warranted; (b) warranted; or (c) warranted but precluded. In this case, we are responsible for determining whether the Snake River fall-run Chinook ESU warrants delisting from the ESA.

The subject delisting petition asserts three points in support of the petitioned action: First, that NMFS may not base delisting criteria by considering only the status of natural (non-hatchery) fish; second, that the ESU has met NMFS' delisting criteria; and, third, that the ESU currently meets the statutory standards for delisting. We discuss these points in the pertinent sections below.

Determination of Species

As currently listed, the Snake River fall-run Chinook salmon ESU consists of the one extant Lower Mainstem Snake River population, which includes all naturally spawned fall-run Chinook salmon originating from the mainstem Snake River below Hells Canyon Dam and from the Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River subbasins. The ESU also includes four artificial propagation programs: The Lyons Ferry Hatchery Program, Fall Chinook Acclimation Ponds Program, Nez Perce Tribal Hatchery Program, and Oxbow Hatchery Program (70 FR 37200; June 28, 2005).

Historically, the Snake River fall-run Chinook ESU also spawned above the Hells Canyon Dam Complex in the upper mainstem Snake River and tributaries (NWFSC 2015; NMFS 2015, Appendix A therein; NMFS 2016). This historical population is now extirpated. The area upstream of Hells Canyon historically supported the majority of all Snake River fall-run Chinook production until the area became inaccessible due to dam construction. The construction of Swan Falls Dam in 1901 blocked access to 157 miles including the historically productive fall-run Chinook habitat in the middle Snake River downstream of Shoshone Falls, a natural barrier to further upstream migration. The construction of dams associated with the Hells Canyon

Dam Complex in the late 1950s and 1960s barred the fish from the remaining spawning areas in the middle mainstem reach. The loss of this upstream habitat and inundation of downstream spawning areas by reservoirs associated with the Hells Canyon Complex and the lower Snake River dams reduced spawning habitat for the single extant population—the Lower Mainstem Snake River population—to approximately 20 percent of the area historically available (NMFS 2016).

As described above, the ESA's definition of 'species' includes distinct population segments, which, for West Coast salmon includes ESUs. The petitioners did not request that we reconsider the composition of the listed Snake River fall-run Chinook ESU. Nonetheless, in our review, we solicited and evaluated all available information not previously considered that might inform a reconsideration of the reproductive isolation and evolutionary significance of the Snake River fall-run Chinook ESU. Information that can be useful in determining the degree of reproductive isolation includes incidences of straying, rates of recolonization, degree of genetic differentiation, and the existence of barriers to migration. Insight into evolutionary significance can be provided by data on genetic and life-history characteristics, habitat and ecological differences, and the effects of stock transfers or supplementation efforts on historical patterns of diversity. There was no such information that was not previously considered and that might warrant reconsideration of the geographical extent and composition of the Snake River fall-run Chinook ESU (NWFSC 2015).

As part of our review, we also evaluated all hatchery programs geographically associated with the Snake River fall-run Chinook ESU to determine whether: Any of the four currently listed hatchery programs had been terminated; any new hatchery programs had been founded that would warrant inclusion in the ESU; the current level of divergence of any listed hatchery stocks relative to the local natural population had increased such that the stock(s) might warrant exclusion from the ESU; and, the level of divergence of any existing non-listed hatchery programs relative to the local natural population had decreased such that the stock(s) might warrant inclusion in the ESU. Our review of the hatchery programs associated with the Snake River fall-run Chinook ESU did not suggest that any changes in the ESU membership of hatchery programs are warranted (Jones 2015).

Based on the foregoing information, we conclude that no changes in the definition of the Snake River fall-run Chinook ESU are warranted at this time. The Snake River fall-run Chinook ESU should remain defined as naturally spawned fall-run Chinook salmon originating from the mainstem Snake River below Hells Canyon Dam and from the Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River subbasins. Also, fall-run Chinook salmon from four artificial propagation programs are included in the Snake River fall-run Chinook ESU: The Lyons Ferry Hatchery Program; Fall Chinook Acclimation Ponds Program; Nez Perce Tribal Hatchery Program; and the Tacoma Power (formerly ''Oxbow'') Hatchery Program.

Assessment of Extinction Risk

We assess the extinction risk of Pacific salmon ESUs using the Viable Salmonid Population (VSP) concept developed by McElhany *et al.* (2000). The VSP concept evaluates four criteria—abundance, productivity, spatial structure, and diversity—to assess species viability. The risk of extinction of an ESU depends upon the abundance, productivity, geographic distribution, and diversity of the naturally spawned populations comprising it. Abundance and productivity need to be sufficient to provide for population-level persistence in the face of year-to-year variations in environmental conditions. Spatial structure of populations should provide for resilience to the potential impact of catastrophic events. Diversity should provide for patterns of phenotypic, genotypic, and life-history diversity that sustains natural production across a range of conditions, allowing for adaptation to changing environmental conditions.

Consideration of Hatchery-Origin Fish

The petitioners assert that NMFS must consider the contribution of hatcheries in any delisting decision where hatchery fish are part of the ESU. The petitioners further state that it would be a violation of the ESA for NMFS to consider whether the Snake River fall-run Chinook ESU meets delisting criteria based only on whether natural, non-hatchery spawners have met certain thresholds. We agree that hatchery fish must be included in our assessment of the Snake River fall-run Chinook ESU's status, in context of their contribution to conserving natural self-sustaining populations, as provided in our Hatchery Listing Policy.

Pursuant to the Hatchery Listing Policy, we base our status determinations for Pacific salmon and steelhead on the status of the entire ESU, including any hatchery fish included in the ESU. As noted above, we consider a hatchery stock to be part of an ESU if the stock's level of genetic divergence relative to the local natural population(s) is no more than what occurs within the ESU (70 FR 37204; June 28, 2005). Consistent with section 2(b) of the ESA (16 U.S.C. 1531(b)), we apply the Hatchery Listing Policy in support of the conservation of naturally-spawning salmon and the ecosystems upon which they depend (70 FR 37204, 37215). Accordingly, we include hatchery fish in assessing the status of an ESU in the context of their contributions to conserving natural self-sustaining populations, which we evaluate by assessing the status of the natural fish that comprise the populations.

The Hatchery Listing Policy recognizes that the presence of hatchery fish within an ESU can positively affect the overall status of the ESU, and thereby affect a listing determination, by contributing to the increased abundance and productivity of the natural populations in the ESU, improving spatial distribution, serving as a source population for repopulating unoccupied habitat, or conserving genetic resources of depressed natural populations in the ESU. Conversely, a hatchery program managed without adequate consideration of its adverse effects can affect the status of an ESU by reducing the reproductive fitness and productivity of the ESU, or reducing the adaptive genetic diversity of the ESU.

There are four hatchery programs included in the Snake River fall-run Chinook ESU: The Lyons Ferry Hatchery Program, Fall Chinook Acclimation Ponds Program, Nez Perce Tribal Hatchery Program, and Oxbow Hatchery Program. These hatchery programs release fish into the mainstem Snake River and Clearwater River which represent the majority of the remaining habitat available to this ESU. Our previous listing determination for the Snake River fall-run Chinook ESU concluded that these hatchery programs collectively do not substantially reduce the extinction risk of the ESU (70 FR 37160; June 28, 2005). These hatchery programs have contributed to the substantial increases in total ESU abundance and spawning escapement. However, the large fraction of naturally spawning hatchery fish complicates assessments of the ESU's productivity. The broad distribution of naturally spawning hatchery fish has increased

the ESU's spatial distribution, although the distribution of natural-origin production in the extant population is unknown due to the prevalence of naturally spawning hatchery fish. The Lyons Ferry Hatchery program has preserved genetic diversity in the past during years of critically low abundance. However, the ESU-wide use of a single hatchery broodstock may pose long-term genetic risks, impede the expression of life-history diversity, and limit adaptation to different habitat areas.

As explained above, we evaluate the status of Pacific Northwest salmon ESUs based on four biological criteria (abundance, productivity, spatial structure, and diversity) with respect to naturally-spawning fish, which reflects how hatchery fish are contributing to the viability of the ESU as a whole. We do not interpret the ESA as requiring that we assess extinction risk based on the abundance, productivity, spatial-structure, or diversity of hatchery fish. Furthermore, failing to account for the biological distinctions between hatchery and naturally spawned salmon would be inconsistent with our obligation to base ESA listing decisions on the best scientific and commercial data available. Our Hatchery Listing Policy has been upheld by the Federal courts as a reasonable interpretation of the ESA (*Trout Unlimited* v. *Lohn,* 599 F.3d 946 (9th Cir. 2009)). The court stated that ''the ESA is primarily focused on natural populations,'' and that ''the [plaintiff's] demand for 'equal treatment' of hatchery and naturally spawned fish during the [status] review process simply finds no grounding in the statutory text of the ESA'' (*Id.* at 957, 960). The petitioners' argument that we must treat hatchery and natural fish equally in evaluating the status of the ESU is inconsistent with our policy and with the court's decision.

Viability Criteria and Recovery Planning

For the purposes of recovery planning and development of recovery criteria, in 2001 we convened the Interior Columbia Technical Recovery Team (Technical Recovery Team) composed of multi-disciplinary scientists from universities as well as Federal, state, and tribal agencies. The Technical Recovery Team was tasked with providing scientific support to recovery planners by developing biologically based viability criteria, analyzing alternative recovery strategies, and providing scientific review of draft plans. The Technical Recovery Team identified independent populations for each Snake River ESA-listed species. These independent populations were grouped into ''major population groups'' based on genetic similarities, shared habitat characteristics, population dispersal distances, and common life-history traits. The Technical Recovery Team determined that the Snake River fall-run Chinook ESU was historically composed of a single major population group only. As noted above, the Snake River fall-run Chinook ESU has been determined to consist of the extant Lower Snake Mainstem population, and an extirpated population that historically occurred in the upper mainstem Snake River and tributaries above the present-day Hells Canyon Dam Complex (ICTRT 2003; NWFSC 2015; NMFS 2016).

In 2007, the Technical Recovery Team also developed biological viability criteria, based on the VSP concept. The viability criteria reference the following levels of extinction risk: ''very low'' risk corresponds to less than a 1 percent risk of extinction over a 100-year period; ''low'' risk corresponds to a 1 to 5 percent risk of extinction over a 100-year period; ''moderate'' risk corresponds to a 6 to 25 percent risk of extinction over a 100-year period; and ''high'' risk corresponds to a greater than 25 percent risk of extinction over a 100-year period (ICTRT 2007). The Technical Recovery Team's report ''*Viability Criteria for Application to Interior Columbia Basin Salmonid ESUs*'' describes the methodology and considerations for determining composite risk scores for abundance/productivity, and for spatial structure/diversity (ICTRT 2007). For an ESU to be determined viable, it needs to achieve at least an overall status of low risk through a combination of its abundance/productivity and spatial structure/diversity risks. An ESU is at least viable overall if its abundance/productivity risk is low to very low, and its spatial structure/diversity risk is moderate to very low.

The Technical Recovery Team recognized that ESUs that contain only one major population group, such as the Snake River fall-run Chinook ESU, are inherently at greater risk of extinction due to more limited spatial structure and diversity, and potentially due to more limited abundance and productivity. To mitigate this inherently higher risk, the Technical Recovery Team applied more stringent viability criteria for ESUs with a single major population group. In addition to achieving an overall status of at least low risk (*i.e.,* a 5 percent or less risk of extinction over 100 years), an ESU with a single major population group also needs to satisfy two additional conditions: Two-thirds or more of the historical populations within the ESU should meet the criteria for low risk; and at least two populations should meet the criteria for very low risk (*i.e.,* highly viable). Applying the Technical Recovery Team's viability criteria, both a re-established population above the Hells Canyon Dam complex and the extant Lower Mainstem Snake River population would need to achieve highly viable status for the Snake River fall-run Chinook ESU to be considered for delisting. Highly viable status for these populations corresponds to very low risk in abundance/productivity and very low to low risk in spatial structure/diversity (the reader is referred to ICTRT (2007) for a detailed description of the Technical Recovery Team's viability criteria). The Technical Recovery Team recognized the difficulty of re-establishing a fall-run Chinook population above the Hells Canyon Dam Complex, and suggested that initial recovery efforts emphasize improving the status of the extant population, while creating the potential for re-establishing an additional population (ICTRT 2007). The Technical Recovery Team also recognized that, in general, ''different scenarios of ESU recovery may reflect alternative combinations of viable populations and specific policy choices regarding acceptable levels of risk'' (ICTRT 2007).

During recovery planning for Snake River fall-run Chinook, we determined that the spatial complexity and size of the extant population provide opportunities for alternative viability scenarios as policy choices for delisting. Each scenario would require specific viability criteria and potential metrics for measuring viability characteristics designed to meet the basic set of viability objectives adopted by the Technical Recovery Team. Those alternative recovery scenarios are presented in the Proposed Recovery Plan (NMFS 2015) along with their corresponding alternative metrics for measuring viability. The scenarios provide a range of potential population characteristics that, if achieved, would indicate that the ESU has met the ESU-level recovery objectives. The scenarios are summarized briefly below:

Scenario A—two populations, one highly viable and the other viable. This scenario would achieve ESU recovery by improving the status of the Lower Mainstem Snake River population to highly viable, and by reestablishing the extirpated Middle Snake River population above the Hells Canyon Dam Complex to viable status. While the Technical Recovery Team viability criteria would require both populations to meet highly viable status, this

scenario would only require ''viable'' status (low risk for abundance/productivity, and moderate to very low risk for spatial structure/diversity) for the reestablished Middle Snake River population. This scenario recognizes that a reestablished population above the Hells Canyon Dam Complex would provide the ESU protection against catastrophic losses, and that a highly viable Lower Mainstem Snake River population would provide a robust expression of life-history diversity.

Scenario B—single population measured in the aggregate. Proposed scenario B illustrates a single-population pathway to ESU recovery, where VSP objectives would be evaluated in the aggregate (population-wide), based on all natural-origin adult spawners. This single-population recovery scenario recognizes the potential spatial complexity within the Lower Mainstem Snake River population, and the potential for the corresponding expression of life-history diversity in the population if it achieved highly viable status. This scenario would require that highly viable status for the extant population to be attained with a higher degree of statistical certainty than in proposed Scenario A.

Potential additional scenarios—natural production emphasis areas. The Proposed Recovery Plan identifies the potential to develop additional single-population recovery scenarios that would be a variation on scenario B. Under these potential additional scenarios, ''natural production emphasis areas'' for some major spawning areas would have a low percentage of hatchery-origin spawners and produce a significant level of natural-origin adult spawners. The remaining major spawning areas could have higher acceptable levels of hatchery-origin spawners than under Scenario B. The single population would still need to achieve a status of ''highly viable'' with a high degree of certainty.

In lieu of a final Snake River fall-run Chinook recovery plan with final delisting scenarios against which to compare current ESU status, in this status review we must base our determination of whether delisting is warranted on the best scientific and commercial information available. The Technical Recovery Team viability criteria, and the proposed recovery scenarios articulated in the Proposed Recovery Plan, provide useful guides for evaluating the conditions that must be met for the petitioned delisting of Snake River fall-run Chinook to be warranted. All of the available viability criteria and recovery scenarios suggest that the extant Lower Mainstem Snake River population must be at least ''highly viable.'' While reestablishing the extirpated Middle Snake River population above the Hells Canyon Dam Complex may not be necessary to achieve recovery, the Lower Mainstem Snake River population must exhibit sufficient demographic and spatial complexity to reduce the risk of catastrophic loss, and must also exhibit sufficient diversity to ensure resilience against future environmental variability and change. If the extant Lower Mainstem Snake River population is highly viable, then it is possible that the Snake River fall-run Chinook ESU may warrant delisting. If the extant Lower Mainstem Snake River population is less than highly viable, it is unlikely that the ESU warrants delisting at this time.

The petitioners argue that the Snake River fall-run Chinook ESU has met the viability criteria established by the Technical Recovery Team and should therefore be delisted. They assert that the long-term risk of ESU extinction is less than 1 percent within a 100-year period, and that the ESU has met NMFS' viability criteria. In particular, they argue that: The ESU has met abundance and productivity criteria; a second population of the ESU has been re-established in the Clearwater River, satisfying the spatial structure criterion; and NMFS' diversity criterion is ''antithetical to the ESA as currently applied to Pacific salmon.'' We address these contentions below.

Evaluation of Demographic Risks

For a more detailed description of the analyses, updated status, trends and viability of the Snake River fall-run Chinook ESU, the reader is referred to the Northwest Fisheries Science Center report (NWFSC 2015) and the Updated Viability Assessment included in the Proposed Recovery Plan (NMFS 2015, Appendix A).

Abundance and Productivity

The geometric-mean abundance for the most recent 10 years of annual spawner escapement estimates (2005–2014) is 6,418 natural-origin fish, with a standard error of 0.19. Natural-origin spawner abundance has increased relative to the levels reported in the last status review (Ford *et al.* 2011), driven largely by relatively high escapements in the most recent 3 years.

In recent years, naturally spawning fall-run Chinook salmon in the lower Snake River have been comprised of both natural-origin returns originating from naturally spawning parents, as well as naturally spawning hatchery-origin fish. These hatchery-origin fall-run Chinook salmon escaping upstream of Lower Granite Dam to spawn naturally are considered to be part of the listed ESU, representing returns from a supplementation program that releases juvenile fish in reaches above Lower Granite Dam, as well as from releases at Lyons Ferry Hatchery that have dispersed upstream.

Prior to the early 1980s, returns of Snake River fall-run Chinook salmon were likely predominately of natural-origin (NWFSC 2015). Natural return levels declined substantially following the completion of the Hells Canyon Dam Complex (1959–1967), and the construction of the lower Snake River dams (1962–1975). Based on extrapolations from sampling at Ice Harbor Dam (1977–1990), the Lyons Ferry Hatchery (1987-present), and at Lower Granite Dam (1990-present), hatchery strays made up an increasing proportion of returns to the Lower Mainstem Snake River population through the 1980s. Strays from out-planting hatchery-origin fall-run Chinook salmon from the Priest Rapids hatchery (an out-of-ESU stock derived from the middle Columbia River fall-run Chinook stocks) and from the Lyons Ferry Hatchery program (considered part of the Snake River fall-run Chinook ESU) were the dominant contributors to these returns through the 1980s. Estimated natural-origin returns of Snake River fall-run Chinook salmon reached a low of less than 100 fish in 1990. Since the 1990s the proportion of natural-origin spawners in the Snake River fall-run Chinook ESU has continued to decline. From 2010–2014, on average, 31 percent of spawners were of natural origin, compared to 37 percent (2005–2009), 38 percent (2000–2004), 58 percent (1995–1999), and 62 percent (1990–1994) in preceding years.

The Northwest Fisheries Science Center report (NWFSC 2015) estimated the recruit per spawner productivity for the extant population (1990–2009 brood years) to be 1.53, with a standard error of 0.18. The productivity analysis indicates that there have been years when abundance was high but productivity (recruits per spawner) fell below the replacement level, suggesting the potential influence of density-dependence, poor ocean conditions, or poor migration conditions. The report acknowledges that there is increasing statistical uncertainty surrounding the productivity estimate and it may not accurately reflect the true productivity of the current population. The true productivity of the extant population is masked by the recent high levels of naturally spawning hatchery fish. Survival improvements resulting from

improved flow conditions for spawning and rearing and increased passage survival through the hydropower system may have increased productivity in recent years. Conversely, recent productivity levels may have decreased as a result of negative impacts of chronically high hatchery proportions across all major spawning areas.

The recent geometric-mean abundance of 6,418 natural spawners is higher than the Proposed Recovery Plan abundance criterion of 3,000 to 4,200 natural spawners (for *Scenario B—single population measured in the aggregate*). The recent geometric-mean abundance is also higher than the Technical Recovery Team viability criteria of 3,000 natural spawners, though the Technical Recovery Team criteria contemplated two viable populations. Recent productivity has been relatively high (approximately 1.53), but it is lower than the Proposed Recovery Plan criterion of 1.7, which includes a buffer to reflect the uncertainty associated with recent productivity estimates. The recent productivity estimate is at or near the Technical Recovery Team productivity criterion of 1.5; however, the Technical Recovery Team criteria contemplated two highly viable populations. The current risk rating from the Northwest Fisheries Science Center report (NWFSC 2015) for abundance/productivity is low risk (*i.e.,* between 1 and 5 percent probability of extinction over 100 years), and reflects uncertainty about whether recent increases in abundance (driven largely by relatively high escapements in the most recent 3 years) can be sustained over the long term. The Technical Recovery Team viability criteria, and all of the potential delisting scenarios in the Proposed Recovery Plan, would require that the extant population meet minimum requirements for ''highly viable'' status, which includes very low risk for abundance and productivity (ICTRT 2007; NMFS 2015; NMFS 2016). Recent abundance and productivity estimates (low risk) do not meet the Technical Recovery Team and proposed delisting scenarios criteria of very low risk (*i.e.,* less than 1 percent probability of extinction over 100 years) (NWFSC 2015; NMFS 2015, Appendix A). To achieve the necessary very low risk rating for abundance/productivity under a single-population recovery scenario, the extant population would need to demonstrate a 20-year geometric-mean productivity of 1.7 or greater (NMFS 2015). The extant population would need to exhibit increased productivity and/or a decrease in the year-to-year variability, while natural-origin abundance of the extant population would need to remain high (*i.e.,* a recent 10-year geometric-mean abundance greater than 4,200 natural-origin spawners). An increase in productivity could occur with a further reduction in mortalities across all life stages. Such an increase could be generated by actions such as a reduction in harvest impacts (particularly when natural-origin spawner return levels are low) and/or further improvements in juvenile survival during downstream migration (NWFSC 2015). Under a single-population recovery scenario with natural production emphasis areas, a very low risk rating for abundance/productivity could be achieved under current abundance levels if one or more major spawning aggregations exhibited relatively low levels of hatchery contributions to spawning (NMFS 2015). At present, there is no indication that any spawning areas are demonstrating lower proportions of hatchery-origin fish (NWFSC 2015).

The petitioners assert that the recent abundance and productivity data demonstrate that the Snake River fall-run Chinook ESU has met the Technical Recovery Team viability criteria. As noted above, we agree that recent geometric-mean abundance and productivity estimates for Snake River fall-run Chinook meet or exceed the Technical Recovery Team abundance/productivity criteria; however, the Technical Recovery Team viability criteria contemplate a recovery scenario involving two highly viable populations (*i.e.,* reestablishment of a viable Middle Snake River population above the Hells Canyon Dam Complex). The recent abundance and productivity estimates for the extant Lower Mainstem Snake River fall-run Chinook population fall short of the ''very low'' risk level that would be required under any of the proposed single-population recovery scenarios.

Spatial Structure and Diversity

The extant Lower Mainstem Snake River fall-run Chinook population consists of a spatially complex set of five historical major spawning areas (ICTRT 2007), each of which consists of a set of relatively discrete spawning patches of varying size (NMFS 2015). Although annual redd surveys show that Snake River fall-run Chinook spawning occurs in all five of the historical major spawning areas, the inability to obtain carcass samples representative of the mainstem major spawning areas makes assessment of natural-origin spawner distributions difficult. Reconstruction of natural-origin spawners based on hatchery expansions and data from homing/dispersal studies on acclimated hatchery releases indicate that four out of the five major spawning areas are contributing to naturally produced returns (NMFS 2015).

The Northwest Fisheries Science Center report (NWFSC 2015) rated the spatial structure/diversity risk for the extant Snake River fall-run Chinook population as moderate risk. The moderate risk rating reflects observed changes in major life-history patterns, shifts in phenotypic traits, and high levels of genetic homogeneity in samples from natural-origin returns. In particular, the moderate risk rating reflects the relatively high proportion of within-population hatchery spawners in all major spawning areas and the lingering effects of previous high levels of out-of-ESU strays. The potential for selective pressure imposed by current hydropower operations and cumulative harvest impacts also contribute to the moderate risk rating.

For the extant Lower Mainstem Snake River population to achieve highly viable status with a high degree of certainty, the spatial structure/diversity rating needs to be at least low risk (NMFS 2015; ICTRT 2007). Achieving low risk for spatial structure/diversity for the Snake River fall-run Chinook ESU would either require re-establishing the extirpated population above Hells Canyon Dam, or that one or more major spawning areas in the Lower Mainstem Snake River population produce a significant level of natural-origin spawners with low influence from hatchery-origin spawners relative to the other major spawning areas. At present, given the widespread distribution of hatchery releases and hatchery-origin returns across all major spawning areas, and the lack of direct sampling of reach-specific spawner composition, there is no indication of a strong differential distribution of hatchery returns among major spawning areas.

The petitioners assert that natural production from the Clearwater River should be regarded as a new population, and as such the petitioners contend that the Technical Recovery Team's (ICTRT 2007) spatial-structure viability criterion of two populations has been satisfied. We do not agree with the petitioners that the Clearwater River represents a separate fall-run Chinook spawning population. The Technical Recovery Team defined an independent population as being isolated to such an extent that exchanges of individuals among the populations do not substantially affect the population

dynamics or extinction risk of the independent populations over a 100-year time frame (McElhany *et al.* 2000; ICTRT 2003). This basic definition from McElhany *et al.* (2000) was also adopted by technical recovery teams in other west coast salmon recovery domains. The Technical Recovery Team evaluated genetic information, distances between spawning areas related to dispersal (straying), as well as life-history and morphological characteristics as indicators of reproductive isolation among populations. The Clearwater River was identified by the Technical Recovery Team as one of the five major spawning areas within the Lower Mainstem Snake River population. The inclusion of fall-run Chinook in the Clearwater River as part of the Lower Mainstem Snake River population is supported by the close distance between spawning areas, the ecological similarity among the spawning areas, the aggressive supplementation efforts in the Clearwater River using a common broodstock collected at Lower Granite Dam, and the strong contribution of naturally spawning hatchery fish from this common hatchery broodstock in all spawning areas (ICTRT 2003). The inclusion of natural production from the Clearwater River was considered as part of the spatial structure/diversity risk rating for the extant population. We also recognize that a high proportion of naturally produced fish originating from the Clearwater River are exhibiting yearling migration strategies due to the differing thermal regime in that major spawning area. The resulting contribution to overall phenotypic life-history diversity reduces the diversity risk to the ESU and was also considered in the spatial structure/diversity risk rating. However, this phenotypic life-history diversity, by itself, is not sufficient to warrant identifying fall-run Chinook in the Clearwater River as an independent population. There is no evidence of sufficient isolation between the fall-run Chinook in the Clearwater River and the other extant spawning areas in terms of discrete demographic patterns, differential straying/dispersal among the spawning areas, or genetic distinctiveness.

The petitioners disagree with our approach to evaluating diversity risk, and assert that the increases in the total number of spawners denote low risk to diversity. We disagree with the petitioners' interpretation of diversity. A low risk to diversity requires demonstration of patterns of phenotypic, genetic and life-history traits that provide for resilience across a range of environmental conditions ensuring long-term evolutionary potential (NMFS 2015; ICTRT 2007; McElhany *et al.* 2000). High levels of total spawner abundance alone do not indicate that essential diversity traits are being conserved.

Summary of Demographic Risks

The Lower Mainstem Snake River fall-run Chinook salmon population is the only extant population remaining from an ESU that historically also included a population upstream of the current location of the Hells Canyon Dam Complex. The abundance of this remaining population has increased substantially in recent years, and the recent increases in natural-origin abundance are encouraging. Overall, the status of the Snake River fall-run Chinook ESU has improved compared to the time of listing and compared to prior status reviews. However, uncertainty remains regarding whether these abundance levels will be maintained, and improvements are needed in the species' productivity and diversity to achieve risk levels consistent with delisting (NWFSC 2015; NMFS 2015; NMFS 2016).

The overall current risk rating for the extant Lower Mainstem Snake River fall-run Chinook population is ''viable.'' This viable risk rating for the Lower Mainstem Snake River population is based on a low risk rating for abundance/productivity (*i.e.,* 1 to 5 percent or less risk of extinction within 100 years), and a moderate risk rating for spatial structure/diversity (*i.e.,* 6 to 25 percent of extinction within 100 years) (NWFSC 2015; NMFS 2015, NMFS 2016). The Technical Recovery Team viability criteria, and all of the potential delisting scenarios in the Proposed Recovery Plan, would require that the extant population meet minimum requirements for ''highly viable'' status through a combination of very low risk for abundance and productivity, and low or very low risk for spatial structure and diversity (ICTRT 2007; NMFS 2015; NMFS 2016). As such, the current biological viability of the Snake River fall-run Chinook ESU falls short of the demographic risk levels necessary to support delisting.

Summary of Factors Affecting the Species

As described above, section 4(a)(1) of the ESA and NMFS implementing regulations (50 CFR part 424) state that we must determine whether a species is endangered or threatened because of any one or a combination of the following five factors: (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) inadequacy of existing regulatory mechanisms; or (E) other natural or man-made factors affecting its continued existence. We evaluated whether and the extent to which each of the foregoing factors contribute to the overall extinction risk of the Snake River fall-run Chinook ESU, and the findings are described in the 5-year Review Report (NMFS 2016). The section below summarizes our findings regarding the threats to the Snake River fall-run Chinook ESU. The petitioners' assertion that the ESU currently meets the statutory standards for delisting is addressed in the corresponding sections below.

(A) The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Both hydropower and land-use activities have had significant impacts on habitat in the mainstem Snake River above Lower Granite Dam. Twelve dams have blocked and inundated habitat, impaired fish passage, altered flow and thermal regimes, and disrupted geomorphological processes in the mainstem Snake River. These impacts have resulted in the loss of historical habitat, altered migration timing, elevated dissolved gas levels, juvenile fish stranding and entrapment, and increased susceptibility to predation. In addition, land-use activities, including agriculture, grazing, resource extraction, and development, have adversely affected water quality and diminished habitat quality throughout the mainstem Snake River (NMFS 2016; NMFS 2015).

All spawning by Snake River fall-run Chinook is currently restricted to the area downstream of the Hells Canyon Dam Complex, where historically only limited spawning occurred (NMFS 2016; NMFS 2015). A large portion of the historical upriver habitat was lost following construction of Swan Falls Dam on the Snake River in 1901, but construction of the Hells Canyon Complex of dams in the late 1950s and 1960s blocked access to remaining upriver spawning areas, and resulted in the extirpation of one of two populations that historically constituted this ESU. The blocked habitat areas above the Hells Canyon Dam Complex historically were the most productive for Snake River fall-run Chinook.

Although successful reintroduction of fall-run Chinook salmon above the Hells Canyon Dam Complex would contribute to the recovery of the ESU, the mainstem habitat above the complex is currently too degraded to support

anadromous fish. Agriculture, grazing, mining, timber harvest, and development activities have led to excessive nutrients, sedimentation, toxic pollutants, low dissolved oxygen, altered flows, and severely degraded water quality in the upper mainstem Snake River (NMFS 2016; NMFS 2015).

Below the Hells Canyon Dam Complex, one extant population in the ESU consists of a spatially complex set of five historical major spawning areas: Two reaches of the mainstem Snake River, and the lower mainstem reaches of the Grande Ronde River, the Clearwater River, and the Tucannon River. Habitat concerns in the fall-run Chinook spawning areas of the Clearwater River include elevated temperature, sediment, and nutrients, flow management, and toxic pollutants. The lower Clearwater River is highly influenced by operations at Dworshak Dam. Since 1992, cold water releases at Dworshak Dam have been managed to improve migration conditions (temperature and flow) in the lower Snake River (NMFS 2016; NMFS 2015). In the Lower Grande Ronde River mainstem, limiting factors include the lack of habitat quality and diversity, excess fine sediment, degraded riparian conditions, low summer flows, and poor water quality. The Tucannon River is limited primarily by sediment load and habitat quantity, with sediment impacts on fall-run Chinook egg incubation and fry colonization considered moderate to high in most reaches, primarily due to agricultural land uses (NMFS 2016; NMFS 2015).

Flow management of the Columbia River hydropower system affects fish density in the estuary and ocean, fish size and condition, the timing of ocean entry, and the growth and survival of fish during later fish life stages. In the estuary, flow management, diking and filling have reduced the availability of in-channel and off-channel habitat for extended rearing of subyearling juvenile Chinook, including components of the Snake River fall-run Chinook ESU. The impact of the loss of estuary habitat complexity likely differs between the fall-run Chinook subyearling and yearling life history-types. The yearlings often migrate through the estuary within about a week, while sub-yearlings can linger for up to several months in shallow nearshore estuary habitat areas (NMFS 2016; NMFS 2015).

The petitioners assert that there is no continued destruction, modification, or curtailment of the habitat or range of the Snake River fall-run Chinook ESU that justifies maintaining the species' ESA listing as threatened. The petitioners argue that the habitat changes are ultimately reflected in population status and trends, and that the recent high levels of abundance demonstrate that the effects of any historical habitat loss or degradation no longer constrain the population. However, as noted above, the historical loss of habitat due to the establishment of mainstem hydropower dams continues to represent a threat to the spatial structure and diversity of the ESU. Ongoing habitat concerns, described above, due to land-use practices and flow management result in degraded water and habitat quality in the area above the Hells Canyon Dam Complex, the spawning area in the lower Clearwater River, and in the other spawning areas of the Lower Mainstem Snake River population (NMFS 2016; NMFS 2015). Additionally, flow management and the loss of Columbia River estuarine habitat have reduced the availability of rearing habitat for migrating juvenile Snake River fall-run Chinook (NMFS 2016; NMFS 2015). As such, we disagree with the petitioners' assertion that historical habitat loss and degradation no longer constrain the population, and furthermore, we find that the continued degradation of habitat poses a threat to the Snake River fall-run Chinook ESU.

If the recovery of the Snake River fall-run Chinook ESU is to include reestablishment of a spawning population above the Hells Canyon Dam Complex, the mainstem habitat above the complex is currently too degraded to support anadromous fish. With respect to the extant Lower Mainstem Snake River population, there is considerable uncertainty as to whether current habitat conditions are sufficient for the population to improve to, and be sustained at, a highly viable level. The Northwest Fisheries Science Center's productivity analysis (NWFSC 2015) suggests the potential influence of density dependence, poor ocean conditions, or poor migration conditions. The lack of major spawning aggregations with low levels of hatchery influence makes it difficult to evaluate the sufficiency of lower mainstem habitat conditions. It is unclear if current habitat conditions can sustain the recent high levels of adult returns and provide resiliency during periods of poor marine or freshwater survival.

Habitat conditions have improved since the last status review (Ford *et al.* 2011); however, habitat concerns remain throughout the Snake River Basin, particularly in regards to mainstem and tributary stream flows, floodplain management, and elevated water temperatures. We conclude that historical habitat loss, and continued degradation and modification of habitat below the Hells Canyon Dam Complex, continue to pose a risk to, and limit the recovery of, the Snake River fall-run Chinook ESU. However, the Snake River 5-year Review Report (NMFS 2016) and the Proposed Recovery Plan (NMFS 2015) outline several opportunities for habitat improvements to provide meaningful improvements in ESU viability.

(B) Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Snake River fall-run Chinook are incidentally caught by both ocean and in-river fisheries, and harvest in these fisheries has the potential to produce selective pressure on migration timing, maturation timing, and size-at-age. No direct estimates are available of the degree of selective pressure caused by ocean harvest impacts on natural-origin Snake River fall-run Chinook. However, ocean exploitation rates based on coded wire tag (CWT) results for sub-yearling releases of Lyons Ferry Hatchery fish are used as surrogates in fisheries management modeling (NMFS 2015, Appendix A). Average annual ocean exploitation rates vary by age, increasing from relatively low levels on age-2 fish to approximately 25 percent on age-4 and age-5 fish (NMFS 2015, Appendix A). Based on the current timing and distribution of the fisheries with CWT recoveries, ocean harvest of Snake River fall-run Chinook salmon is assumed to impact both maturing and immature fish (NMFS 2015, Appendix A). As a result, the cumulative impact of ocean harvest is higher on components of the run maturing at older ages. Snake River fall-run Chinook salmon are also harvested by in-river fisheries, largely in mainstem Columbia River fisheries on aggregate fall-run Chinook salmon runs, including the highly productive Hanford Reach stock. Exploitation rates of in-river fisheries also increase with age-at-return.

Fishery impacts from ocean and in-river fisheries on Snake River fall-run Chinook viability are controlled through harvest agreements (*e.g.,* the Pacific Salmon Treaty, May 2008 *U.S.* v. *OR* Management Agreement). These agreements, on average, have reduced impacts of fisheries on Snake River fall-run Chinook. Year-specific acceptable harvest rates are determined by an abundance-based framework that constrains the aggregate of ocean and in-river fisheries in years of low abundance, and allows for increased harvest opportunity in years of high abundance. Information available since the 2011 status review indicates that combined ocean and in-river harvest

rates have remained at approximately 33 percent annually for Snake River fall-run Chinook (NMFS 2016).

Snake River fall-run Chinook are also taken through scientific research activities. Robust and multifaceted research and monitoring efforts are underway in the Snake River Basin to inform analyses of habitat status and trends, fish population status and trends, population response to various habitat conditions and restoration treatment types, and the effectiveness of various types of actions in addressing specific limiting factors for all of the listed Snake River salmonid species. Given the mounting demand for take under various research and monitoring initiatives, it is likely that these activities are having an increasing negative impact on the Snake River species, including Snake River fall-run Chinook. However, these research and monitoring efforts are closely scrutinized through ESA section 10(a)(1)(A) and 4(d) research-permit approvals to ensure that such activities do not operate to the disadvantage of the species. The total mortality authorized for all scientific research permits on natural-origin adult Snake River fall-run Chinook is approximately 0.01 percent of the recent 10-year geometric-mean abundance.

The petitioners argue that there is no evidence to conclude that overutilization is, or has been, a threat to the ESU. We conclude that the risk to the persistence of the ESU due to overutilization remains essentially unchanged since the last status review (Ford *et al.* 2011), and does not pose a threat to, nor limit the recovery potential of, the Snake River fall-run Chinook ESU. Accordingly, we do not address petitioners' arguments regarding this factor.

(C) Disease or Predation

Predation, competition, other ecological interactions, and disease affect the viability of Snake River fall-run Chinook salmon by reducing abundance, productivity, and diversity. Predation rates by both fish and birds on subyearling Snake River fall-run Chinook are a concern during the smolt outmigration. Northern pikeminnow, smallmouth bass and avian predators selectively target subyearling outmigrants relative to larger yearling migrants. Consequently, mortality due to this predation influences species diversity, as well as abundance and productivity. Predation by sea lions and other marine mammals has less of an effect on species viability because most adult Snake River fall-run Chinook are not migrating through the lower Columbia River in the spring when the marine mammals are most abundant.

Currently, it is not clear whether or how density-dependent habitat effects, and competition with hatchery-origin fish for limited habitat, are influencing natural-origin production. It is also unclear whether competition between adult Snake River fall-run Chinook salmon and non-native species, such as shad, in the mainstem migration corridor and estuary is affecting species viability. Additional research is needed to understand the potential significance of this risk.

Disease rates over the past 5 years are believed to be consistent with the previous review period. Climate change impacts such as increasing temperature may increase susceptibility to diseases. The disease rates have continued to fluctuate within the range observed in past review periods and are not expected to affect the extinction risk of the Snake River fall-run Chinook ESU.

We conclude that the current levels of disease, predation, competition and other ecological interactions are not a threat to the persistence or recovery potential of the Snake River fall-run Chinook ESU (NMFS 2016). Because we conclude that this factor is not currently limiting species recovery, we do not address the petitioners' arguments regarding this factor.

(D) Inadequacy of Existing Regulatory Mechanisms

Various Federal, state, county and tribal regulatory mechanisms are in place to reduce habitat loss and degradation caused by human land-use and development, as well as reduce risks due to the hydropower system, harvest and hatchery impacts, and predation. New information available since the last status review (Ford *et al.* 2011) indicates that the adequacy of some regulatory mechanisms has improved. Noteworthy improvements in specific regulatory mechanisms are summarized in the Snake River 5-year review report (NMFS 2016).

There are a number of remaining concerns regarding existing regulatory mechanisms, including:

- Lack of documentation or analysis of the effectiveness of land-use regulatory mechanisms and land-use management programs.
- Revised land-use regulations to allow development on rural lands (Adoption of Measure 37, with modification by Measure 49, in Oregon).
- Water rights allocation and administration issues in Oregon and Idaho.
- Continued implementation of management actions in some areas, which negatively impacts riparian areas.
- Lack of implementation and documented impacts or improvements of completed Total Maximum Daily Load standards (TMDLs) in Oregon.
- Increased mining and mineral extraction activities. In Idaho, mining still takes place under the 1872 Mining Law, giving agencies limited discretion in how they regulate it. Issues related to mining threats in the Snake River Basin have expanded since the last status review.
- Effects of commonly applied chemical insecticides, herbicides, and fungicides which are authorized for use per the Environmental Protection Agency label criteria. All West Coast salmonids are identified in a series of NMFS section 7 consultations as jeopardized by at least one of the analyzed chemicals; most are identified as being jeopardized by many of the chemicals. In 2014, a jeopardy biological opinion was issued for Idaho and, in 2012, for Oregon, regarding the respective state's water quality standards for toxic pollutants (NMFS 2016). This will result in promulgation of new standards for mercury, selenium, arsenic, copper and cyanide in Idaho; and for cadmium, copper, ammonia, and aluminum in Oregon.
- Development within floodplains, which continues to be a regional concern. This frequently results in stream bank alteration, stream bank armoring, and stream channel alteration projects to protect private property that do not allow streams to function properly and result in degraded habitat. It is important to note that, where it has been analyzed, floodplain development that occurs consistently with the National Flood Insurance Program's minimum criteria has been found to jeopardize 18 species of West Coast salmonids.
- The need for future Forest Service Plan reviews to continue to address how forest practices can support recovery of salmon and steelhead.

The risk to the species' persistence because of the inadequacy of existing regulatory mechanisms has decreased slightly, based on the improvements noted in the Snake River 5-year review report (NMFS 2016). The petitioners assert that the increases in abundance for Snake River fall-run Chinook demonstrate that inadequacy of regulatory mechanisms cannot be a threat to Snake River fall-run Chinook. We do not agree with the petitioners' argument that we should evaluate this statutory factor based solely on the abundance of the ESU. As noted above,

we identified historical habitat loss and continued habitat degradation and modification below the Hells Canyon Dam Complex as ongoing threats to the Snake River fall-fun Chinook ESU. These ongoing threats could be ameliorated by strengthening existing regulatory mechanisms (NMFS 2016). As such, we conclude that the inadequacy of existing regulatory mechanisms continues to pose a threat to the persistence and limit the recovery potential of the Snake River fall-run Chinook ESU.

(E) Other Natural or Man-Made Factors Affecting Its Continued Existence

The petitioners note that our final rule listing the Snake River fall-run Chinook ESU identified drought as a factor that may have contributed to reduced productivity, and argue that drought is no longer a factor affecting the species due to flow regulation by the Federal Columbia River Power System. Our current status review (NMFS 2016) for the species does not identify drought as a factor affecting the species' continued existence. However, we have identified other factors in this category that present a risk to the species' future persistence.

Climate Change

The potential impacts of climate change on the extinction risk and recovery potential of the Snake River fall-run Chinook ESU are described in more detail in the Proposed Recovery Plan (NMFS 2015). Climate experts predict physical changes to rivers and streams in the Columbia Basin that include: Warmer atmospheric temperatures resulting in more precipitation falling as rain rather than snow; diminished snow pack resulting in altered stream flow volume and timing; increased winter flooding; lower late summer flows; and a continued rise in stream temperatures. These changes in air temperatures, river temperatures, and river flows are expected to cause changes in salmon and steelhead distribution, behavior, growth, and survival, in general. However, the magnitude and timing of these changes, and specific effects on Snake River fall-run Chinook salmon remain unclear.

Climate change and increased water temperatures in the mainstem lower Snake River could cause delays in adult migration and spawn timing, increased adult mortality, and reduced spawning success. Delays in adult migration and spawn timing in turn could cause delays in fry emergence and dispersal and delayed smolt outmigration, although it is also possible that increased overwintering temperature could reduce the impacts on emergence timing. If delays in emergence timing are long (*e.g.,* weeks) then the timing of smolt outmigration may be altered. This could result in a marine transition potentially poorly timed with favorable ocean conditions, and possibly increase exposure to predators. Warmer temperatures will increase metabolism, which may increase or decrease juvenile growth rates and survival, depending upon availability of food. Increases in water temperatures in Snake and Columbia River reservoirs could also increase predation on juveniles by warm-water fish species, and increase food competition with other species such as shad. Reduced flows in late spring and summer may lead to delayed outmigration of juveniles and higher mortality.

The effects of climate change on Snake River fall-run Chinook in the estuary and plume may include a reduction in the quantity and quality of rearing habitat, and an altered distribution of salmonid prey and predators. The effects of climate change in marine environments include increased ocean temperature, increased stratification of the water column, changes in the intensity and timing of coastal upwelling, and ocean acidification. Modeling studies that explore the marine ecological impacts of climate change have concluded that salmon abundances in the Pacific Northwest and Alaska are likely to be reduced. Uncertainty regarding the long-term impacts of climate change and the ability of Snake River fall-run Chinook to successfully adapt to an evolving ecosystem represent risks to the species' persistence and recovery potential.

Hatchery Fish

Snake River fall-run Chinook salmon hatchery production has increased and so have hatchery-origin returns. Considerable uncertainty remains about the effect of the Snake River fall-run Chinook hatchery programs on the Lower Mainstem Snake River population. Much of this uncertainty reflects the fact that the remaining population is very difficult to study because of its geographic extent, habitat, and logistical issues. This uncertainty, however, is more important in the case of Snake River fall-run Chinook than in many other ESA-listed salmonid populations because the current population is the only extant population in the ESU, and it must reach a highly viable level under any scenario for the ESU to be considered recovered (ICTRT 2007; NMFS 2015). As noted above in the Evaluation of Demographic Risks, the true productivity of the extant population is masked by the recent high levels of naturally spawning hatchery fish, and this high proportion of within-population hatchery spawners in all major spawning areas contributes to the moderate risk rating in spatial structure and diversity.

We conclude that, based on the high level of uncertainty associated with projecting the impacts of climate change and resolving the influence of hatchery production, other natural or man-made factors represent a threat to the persistence and recovery potential of the Snake River fall-run Chinook.

Efforts Being Made To Protect the Species

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 listing determinations, we first assess ESU extinction risk and identify factors that have led to its decline. Then we assess existing efforts being made to protect the species to determine if those measures ameliorate the threats or section 4(a)(1) factors affecting the ESU.

Summary of Protective Efforts

Previous listing determinations have described ongoing protective efforts that are likely to promote the conservation of ESA-listed salmonids, including the Snake River fall-run Chinook. In the Snake River Basin 5-year Review Report (NMFS 2016), we note the many habitat, hydropower, hatchery, and harvest improvements that occurred in the past 5 years. We are currently working with our Federal, state, and tribal co-managers to develop monitoring programs, databases, and analytical tools to assist us in tracking, monitoring, and assessing the effectiveness of these improvements.

The abundance of natural-origin Snake River fall-run Chinook in the one extant population has increased substantially since listing. We attribute this increase to a combination of actions that improved survivals through the hydropower system, reduced harvest, and increased production through hatchery supplementation. Key protective actions related to Snake River fall-run Chinook mainstem and tributary habitat include (NMFS 2015; NMFS 2016):

- Continued implementation of Idaho Power Company's fall Chinook salmon spawning program to enhance and maintain suitable spawning and incubation conditions.

• Continued implementation of the FCRPS Biological Opinion, including hydropower system operations such as cool-water releases from Dworshak Dam to maintain adequate migration and rearing conditions in the lower Snake River, summer flow augmentation and summer spill at multiple projects to maintain migration and passage conditions, and operations at Lower Granite Dam to address adult passage blockages caused by warm surface waters entering the fish ladders.

• Continued implementation of Lower Snake River Programmatic Sediment Management Plan measures to reduce impacts of reservoir and river channel dredging and disposal on Snake River fall-run Chinook.

• Continued implementation of recovery plan actions in tributary and lower mainstem habitats to maintain and improve spawning and rearing potential for Snake River fall-run Chinook (Although these actions are generally focused on Snake River spring/summer Chinook salmon and steelhead and, therefore, located above fall-run Chinook spawning and rearing habitats, the actions have cumulative beneficial effects on downstream habitats).

• Large-scale restoration projects in the Tucannon River, which have been highly effective in reestablishing channel functions related to temperature, floodplain connectivity, channel morphology, and habitat complexity. These key protective efforts were largely possible thanks to the persistence and support from the Snake River Salmon Recovery Board, Washington Department of Fish and Wildlife, and local restoration partners.

Programs such as these are critical if we are to address the threats and limiting factors facing the ESU to improve its viability. However, at this time, we conclude that these and other protective efforts are insufficient to ameliorate the threats facing the Snake River fall-run Chinook ESU to the extent where delisting would be warranted.

Final Determination

The petitioners' arguments that the Snake River fall-run Chinook ESU should be delisted are based in large measure upon the prevalence of hatchery-produced fish and their view that we impermissibly emphasize the naturally spawned component of the ESU in our viability assessments. We disagree and conclude that, consistent with the Hatchery Listing Policy and the Ninth Circuit Court of Appeals ruling in *Trout Unlimited* v. *Lohn,* hatchery fish should be evaluated in the context of their contributions to the conservation of the naturally spawned population(s).

As noted above (see *Viability Criteria and Recovery Planning*), the Technical Recovery Team viability criteria (ICTRT 2007) and the proposed recovery scenarios articulated in the Proposed Recovery Plan (NMFS 2015) provide useful guides for evaluating the conditions that must be met for the delisting of Snake River fall-run Chinook to be warranted. All the viability criteria and proposed recovery scenarios conclude that the extant Lower Mainstem Snake River population must be at least highly viable. The Northwest Fisheries Science Center report (NWFSC 2015) concluded that the Lower Mainstem Snake River population is currently viable, but is less than highly viable. In other words, the current risk level of the Snake River fall-run Chinook ESU does not meet the status described in the Technical Recovery Team report and the Proposed Recovery Plan as necessary for the recovery of the ESU.

Additionally, based on our evaluation of the five section 4(a)(1) factors, above, we conclude that historical habitat loss, continued degradation and modification of habitat, and the inadequacy of regulatory mechanisms continue to pose threats to, and limit the recovery potential of, the Snake River fall-run Chinook ESU. Disease, predation, and overutilization do not pose threats to the ESU at this time. We also find that the high levels of uncertainty associated with projecting the effects of other natural or man-made factors affecting the continued existence of the ESU represent a threat to the persistence and recovery potential of the Snake River fall-run Chinook ESU. This latter uncertainty, particularly that conferred by the prevalence and broad distribution of hatchery-origin fish across all major spawning areas, needs to be addressed if we are to be able to assess the viability of the extant Lower Mainstem Snake River population with sufficient certainty. After reviewing efforts being made to protect salmonids and their habitat in the Snake River Basin, we conclude that these efforts are insufficient to ameliorate the threats facing the Snake River fall-run Chinook ESU to the point where the species would warrant delisting.

Based on our review of the species' viability, the five section 4(a)(1) factors, and efforts being made to protect the species, we conclude that the Snake River fall-run Chinook ESU is likely to become an endangered species throughout all or a significant portion of its range in the foreseeable future. We conclude that the petitioned action to delist the Snake River fall-run Chinook ESU is not warranted at this time, and as such it shall retain its status as a threatened species under the ESA.

References

A complete list of all references cited herein is available upon request (see **FOR FURTHER INFORMATION CONTACT**).

Authority

The Authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: May 19, 2016.

Samuel D. Rauch III,

Deputy Assistant Administrator for Regulatory Programs, National Marine Fisheries Service.

[FR Doc. 2016–12453 Filed 5–25–16; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Submission for OMB Review; Comment Request; ''Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures''

The United States Patent and Trademark Office (USPTO) will submit to the Office of Management and Budget (OMB) for clearance the following proposal for collection of information under the provisions of the Paperwork Reduction Act (44 U.S.C. Chapter 35).

Agency: United States Patent and Trademark Office, Commerce.

Title: Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures.

OMB Control Number: 0651–0024.

Form Number(s):

• PTO/SB/93.

Type of Request: Regular.

Number of Respondents: 27,200.

Estimated Time per Response: The USPTO estimates that it will take approximately 6 minutes (0.10 hours) to 6 hours to complete a single item in this collection. This includes the time to gather the necessary information, create the documents, and submit the completed request to the USPTO.

Burden Hours: 152,285 hours.

Cost Burden: $1,815,457.50.

Needs and Uses: Patent applications that contain nucleotide and/or amino acid sequence disclosures must include a copy of the sequence listing in accordance with the requirements in 37 CFR 1.821–1.825. Applicants submit copies of sequence listings for both U.S.