

APPENDIX J

Listing Factor (Threats) Criteria

Listing factors are those features that were evaluated under section 4(a)(1) when the initial determination was made to list the species for protection under the ESA. These may or may not still be limiting recovery when in the future NMFS reevaluates the status of the species to determine whether the protections of the ESA are no longer warranted and the species could be delisted. At the time of a delisting decision, NMFS will examine whether the section 4(a)(1) listing factors have been addressed. To assist in this examination, NMFS will use the listing factors (or threats) criteria described below in addition to biological recovery criteria.

The five listing factors (or threats) described in section 4(a)(1) of the ESA are the following:

- A. The present or threatened destruction, modification, or curtailment of [the species'] habitat or range
- B. Over-utilization for commercial, recreational, scientific or educational purposes
- C. Disease or predation
- D. The inadequacy of existing regulatory mechanisms
- E. Other natural or manmade factors affecting its continued existence

NMFS proposes that, to determine that the affected ESUs are recovered to the point that they no longer require the protections of the ESA, the above listing factors should be addressed according to the specific criteria identified for each of them (below) so that de-listing is not likely to result in re-emergence of the threat. It is possible that current perceived threats will become insignificant in the future as a result of changes in the natural environment or changes in the way threats affect the entire life cycle of salmon. Consequently, NMFS expects that the ranking of threats will change over time and that new threats may be identified. During the status reviews, NMFS will evaluate and review the listing factor criteria under conditions at the time.

The specific criteria listed below for each of the relevant listing/de-listing factors help to ensure that underlying causes of decline have been addressed and mitigated prior to considering a species for de-listing.

Factor A: Present or threatened destruction, modification, or curtailment of a species' habitat or range

To determine that the ESUs are recovered, threats to habitat should be addressed as outlined below:

1. Passage obstructions (e.g., dams and culverts) are removed or modified to improve survival and restore access to historically accessible habitat where necessary to support Middle Columbia River steelhead recovery goals as described in the SRSRB Plan.
2. Flow conditions and instream flow targets that support adequate steelhead rearing, spawning, and migration are achieved through management of mainstem and tributary irrigation and hydropower operations, and through the improvement of other water user efficiencies and conservation, including for municipal supply and other consumptive purposes.

3. Forest management practices that protect watershed and stream functions are implemented on Federal, state, tribal, and private lands.
4. Agricultural practices, including grazing, are implemented to protect and restore riparian areas, floodplains, and stream channels, and to protect water quality from sediment, pesticide, herbicide, and fertilizer runoff.
5. Urban and rural development, including land use conversion from agriculture and forestland to urban areas, does not reduce water quality or impair natural stream conditions.
6. The effects of toxic contaminants on salmonid fitness and survival in mainstem rivers and tributaries are sufficiently limited so as not to affect recovery.
7. Channel function, including vegetated riparian areas, canopy cover, stream-bank stability, off-channel and side-channel habitats, natural substrate and sediment processes, and channel complexity is restored to provide adequate rearing and spawning habitat.
8. Floodplain function and the availability of floodplain habitats for salmon are restored to a degree sufficient to support viable ESUs. This restoration should include connectedness between river and floodplain and the restoration of impaired sediment delivery processes.

For additional information on current threats resulting from habitat degradation and loss, see the SRSRB Plan's Section 4, Factors Affecting Population Viability.

Factor B: Over-utilization for commercial, recreational, scientific, or educational purposes

To determine that the ESUs are recovered, any utilization for commercial, recreational, scientific, or educational purposes should be managed as outlined below:

1. Fishery management plans for salmon ESUs are in place that (a) accurately account for total fishery mortality (i.e., both landed catch and non-landed mortalities) and constrain mortality rates to levels that are consistent with achieving ESU viability (i.e., provide for adequate spawning escapement given their productivity); and (b) are implemented in such a way as to avoid deleterious genetic effects on populations or negatively affect the distribution of populations.
2. Fishery rules and regulations are effectively enforced.
3. Technical tools accurately assess the effects of the harvest regimes so that harvest objectives are met but not exceeded.
4. Handling of fish is minimized to reduce indirect mortalities associated with education or scientific programs.

For additional information on threats related to harvest actions, see the SRSRB Plan's Section 4, Factors Affecting Population Viability.

Factor C: Disease or predation

To determine that the ESUs are recovered, any disease or predation that threatens their continued existence should be addressed as outlined below:

1. Hatchery operations do not subject steelhead populations to deleterious diseases and parasites and do not result in increased predation rates of wild fish.
2. Predation by avian predators is managed in a way that promotes recovery of salmon and steelhead populations.
3. The northern pike minnow fishery is managed to reduce predation on steelhead as appropriate to meet recovery goals.
4. Populations of introduced smallmouth bass and catfish are managed such that competition or predation does not impede steelhead recovery.
5. Physiological stress and physical injury that may cause disease or increase susceptibility to pathogens during rearing or migration should be reduced during critical low flow periods (e.g., low water years) or poor passage conditions (e.g., at diversion dams or bypasses).

For additional information on current threats resulting from disease or predation, see the SRSRB Plan's Section 4, Factors Affecting Population Viability.

Factor D: The inadequacy of existing regulatory mechanisms

To determine that the ESUs are recovered, any inadequacy of existing regulatory mechanisms that threatens their continued existence should be addressed as outlined below:

1. Adequate resources, priorities, regulatory frameworks, and coordination mechanisms are established and/or maintained for effective enforcement of land and water use regulations that protect and restore habitats, and for the effective management of fisheries.
2. Habitat conditions and watershed functions are protected through land-use planning that guides human population growth and development.
3. Habitat conditions and watershed function are protected through regulations that govern resource extraction such as timber harvest and gravel mining.
4. Habitat conditions and watershed functions are protected through land protection agreements as appropriate, where existing policy or regulations do not provide adequate protection.
5. Regulatory, control, and education measures to prevent additional exotic species invasions are in place.

For additional information on existing regulatory mechanisms, see Section 8.2.1 of the SRSRB Plan's Summary.

Factor E: Other natural or manmade factors affecting its continued existence

To determine that the ESUs are recovered, other natural and man-made threats to their continued existence should be addressed as outlined below:

1. Hatchery programs are being operated in a manner that is consistent with individual watershed and region-wide recovery approaches; appropriate criteria are used for the integration of hatchery populations and extant natural populations inhabiting watersheds where the hatchery fish return.

2. Hatcheries operate using appropriate ecological, genetic, and demographic risk containment measures for (1) hatchery-origin adults returning to natural spawning areas, (2) release of hatchery juveniles, (3) handling of natural-origin adults at hatchery facilities, (4) withdrawal of water for hatchery use, (5) discharge of hatchery effluent, and (6) maintenance of fish health during their propagation in the hatchery.

3. Mechanisms are in place to reduce the incidence of, and impacts from, introduced, invasive, or exotic species.

4. Nutrient enrichment programs must be evaluated to determine where additional nutrient inputs can provide significant benefits.

5. Water operations management in mainstem rivers and tributaries maximize survival of juvenile rearing, emigrating smolts and immigrating and spawning adults.

For additional information on other threats, see the SRSRB Plan's Section 4, Factors Affecting Population Viability.