Appendix D: Provisional Statement of Biological Objectives for Environmental Characteristics at the Basin Level

The following is a provisional set of environmental characteristic objectives for the basin level. The Council has asked the Independent Scientific Advisory Board to review these provisional basin level environmental characteristics by June 2001. The ISAB will report to the Council on the scientific soundness and basinwide applicability of the environmental characteristics, as well as their utility for further defining biological objectives at the province and subbasin levels. As part of its review, the ISAB should consider and report to the Council on the applicability of these objectives in the most altered areas of the basin, the blocked areas.

The Council will make the ISAB's report publicly available and seek views and comment from interested parties. The Council will consider the report of the ISAB and the views and comments of others on the report, and will confirm or revise these basin level objectives for environmental characteristics for purposes of providing guidance for subbasin level planning and further program amendments.

Provisional biological objectives for environmental characteristics at the basin level

Basin level environmental characteristics describe the kinds of changes that are needed across the Columbia basin to achieve the biological performance objectives called for by the program.

1. **Protect the areas and ecological functions that are at present relatively productive for fish and wildlife populations (e.g., the Hanford Reach fall chinook; spring chinook in the upper John Day River) to provide a base for expansion of healthy populations as we rehabilitate degraded habitats in other areas.**

- Protect and enhance habitats and ecological function to allow for the restoration of more natural population structures, by allowing for the expansion of productive populations and by habitat restoration actions that connect weak populations to stronger populations and to each other. Allow for the recovery of depleted and listed populations to at least the point of self-sustainability and a low probability of extinction.

- Protection and expansion of habitats and ecological functions should allow for an increase in the number, complexity and range of multi-species fish and wildlife assemblages and communities. Increases in the productivity, abundance, and life-history diversity of specific fish and wildlife populations are dependent on, and should not be viewed in isolation from, these multi-species communities.

2. **Protect and restore freshwater habitat for all life history stages of the key species. Protect and increase ecological connectivity between aquatic areas, riparian zones, floodplains and uplands.**

- Increase the connections between rivers and their floodplains, side channels and riparian zones.

- Manage riparian areas to protect aquatic conditions and form a transition to floodplain terrestrial areas and side channels.

- Identify, protect and restore the functions of key alluvial river reaches.

- Reconnect restored tributary habitats to protected or restored mainstem habitats, especially in the area of productive mainstem populations.

3. **Allow patterns of water flow to move more than at present toward the natural hydrographic pattern in terms of quantity, quality and fluctuation.**

- Habitat restoration may be framed in the context of measured trends in water quality.

- Allow for seasonal fluctuations in flow. Stabilize daily fluctuations.

- Increase the correspondence between water temperatures and the naturally-occurring regimes of temperatures throughout the basin.

- Significantly reduce watershed erosion where human activities have accelerated sediment inputs.

4. **Increase energy and nutrient connections within the system to increase productivity and expand biological communities.**

5. **Allow for biological diversity to increase among and within populations and species to increase ecological resilience to environmental variability.**

- Expand the complexity and range of habitats to allow for greater life history and between species diversity.

- Manage human activities to minimize artificial selection or limitation of life history traits.

- Restoring habitat and access to habitat that establishes life history diversity is a priority.

6. **Increase genetic connections and gene flow within the ecological system to facilitate development, expansion and protection of population structures.**

   - Increase the abundance and range of existing habitats and populations.
   - Expand and connect existing habitat pockets to facilitate development of resilient population structures for aquatic communities.

7. **Identify, protect and restore ecosystem functions in the Columbia River estuary and nearshore ocean discharge plume as affected by actions within the Columbia River watershed.**

   - Evaluate flow regulation, river operations and estuary-area habitat changes to better understand the relationship between estuary and near-shore plume characteristics and the productivity, abundance and diversity of salmon and steelhead populations.

8. **Enhance the natural expression of biological diversity in salmon and steelhead populations to accommodate mortality and environmental variability in the ocean.**

9. **Accept significant variation in the productivity, capacity and life-history diversity for any particular population over any particular time period, as part of the normal environmental condition. A measure of whether key ecological functions have increased sufficiently will be whether the system can accept normal environmental variation without collapse of the fish and wildlife population and community structure.**

Basin and province level objectives must also describe expectations for the characteristics of the mainstem, estuary and ocean environments shared by all populations of salmon and steelhead in the subbasins. In other words, subbasin planners need to know what are the program's expectations or assumptions for survival of their respective populations in the parts of their life cycles outside the subbasins, including survival through the mainstem and in the estuary and ocean. For example, the objectives and strategies that planners would choose for a subbasin might vary substantially if expectations for juvenile survival through the mainstem over the planning period are 50 percent versus 90 percent.