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# **Technical Document Snake River Salmon Recovery Plan for SE Washington**

*Prepared by*

**Snake River Salmon Recovery Board**

*Prepared for*

Washington Governor's Salmon Recovery Office

## ACKNOWLEDGEMENTS

|                   |  |
|-------------------|--|
| Model Watersheds  | Asotin, Tucannon, Pataha   |
| Subbasin Planning | Asotin, Lower Snake, Tucannon, Walla Walla   |
| Recovery Planning | Snake River Salmon Recovery Board<br>U.S. Army Corps of Engineers<br>U.S. Fish and Wildlife Service<br>U.S. Forest Service<br>Washington Department of Ecology<br>Washington Department of Fish and Wildlife |
| WRIA 32 Planning  |  |
| WRIA 35 Planning  |  |

## PREFACE

The Snake River Salmon Recovery Plan (SRSRP) has been developed in a locally-focused, open, public process. It identifies actions that interests in the Snake River Salmon Recovery Region (Region) intend to implement to assist in the overall effort to restore salmon populations to levels that are biologically, culturally and economically viable. In developing the December 2006 Version of the SRSRP, the Snake River Salmon Recovery Board (SRSRB) has identified several statements to guide the implementation and understanding of the SRSRP as follows:

### **1. MONITORING**

The SRSRB intends that monitoring activities occur in the Region to compare with a baseline that will be established as noted below under “Inventory”. Monitoring standards and protocols for recovery actions were not finalized by the National Marine Fisheries Service (NMFS) at the time the December 2006 Version of the SRSRP was completed. It is important that the monitoring efforts identified in the SRSRP are reviewed for consistency with those identified by NMFS once finalized. For this reason, the SRSRB reserves the right to revise the SRSRP monitoring section when the NMFS standards are available.

### **2. RECOGNITION**

The SRSRB requests that the State of Washington and the federal government recognize: 1) the work that has been completed in development of the SRSRP and 2) the actions that have been and will be implemented for recovery of salmon in the Region. The SRSRB requests that NMFS consider establishing recovery objectives for populations, or major population groupings where applicable, that allow for the Region’s management units to be “provisionally” de-listed pending work yet to be completed outside of the Region.

### **3. REGULATORY CONTROL**

The SRSRB intends that the SRSRP provide the mechanism for local governments to retain control over local ordinances and regulations. Regardless, by identifying these recovery actions the SRSRB does not intend that the actions become regulatory. The success of this plan is dependent on consensus and collaboration with a number of diverse groups and agencies. Any attempt to reduce this collaboration to regulation will result in failure. The SRSRP identifies numerous types of actions that will be considered for implementation in the various funding processes available. The specific projects implemented will be based on funding priorities identified in these processes as well as the overall funding available for projects. The SRSRB does envision that regulatory relief through expedited permitting processes will be provided for actions in the SRSRP.

### **4. IMPLEMENTATION**

The Plan defines the Region’s desired implementation structure including roles, functions and relationship to the Lead Entity and watershed planning units. This language has been included in Chapter 8 of the SRSRP.

## **5. RECOVERY**

In the SRSRP, the SRSRB has identified the metric it intends to use as a “surrogate” for SRSRP validation. This metric is the number of juvenile offspring produced per adult that leave the Region on an annual basis. As the SRSRP is implemented, the SRSRB expects this number to increase. This is the only metric that is useful for determining whether the actions taken under the SRSRP are effective at assisting in recovery of the Region’s salmon populations because the Region has no control over factors that affect productivity outside of the Region (i.e., in the mainstem Columbia River, Columbia River estuary, and ocean). Regardless, it is paramount that all in-Region and out-of-Region factors that affect salmon recovery be addressed to accomplish recovery of these populations.

## **6. ADAPTIVE MANAGEMENT**

The SRSRP is a dynamic document subject to change as more information is accumulated from monitoring efforts. The SRSRP incorporates an adaptive management approach that accommodates this fact. The SRSRB requests that NMFS recognize this fact and include it in the federal register notice when the SRSRP is posted for review.

## **7. ECONOMICS**

The SRSRB recognizes all benefits provided by the implementation of the SRSRP. Healthy salmon populations provide for economic benefits generated from tribal, commercial and sport fishing industries. Additional benefits include improved water quality and quantity for industry, agriculture, recreation and human health. In addition, economic benefits include those related to regulatory relief, expedited permitting, and reduced permitting expenses.

## **8. INVENTORY**

The SRSRP should report a definitive baseline for the actions that are recommended in the plan (e.g., twenty years ago there were 1,000 poorly screened diversions, today there are only 200 and the target is to properly screen all 1,000 by 2010). The same information for riparian buffers, upland practices, fish passage barriers, in each subbasin and/or MSA needs to be reported. The SRSRB recognizes that this information is generally available, but it has not yet been compiled by the implementing organizations because of the time needed for and cost of assembling this information. The intent of this inventory will be to identify for and provide credit to all interested parties for the significant amount of work has already occurred. This inventory and baseline identification needs to occur as soon as is practicable. As noted above, establishment of a baseline will be vital to measure the effectiveness of monitoring efforts as well.

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| L.....  | Detailed Implementation Plans  |
| M.....  | Habitat Factors and Actions  |

## ACRONYMS AND ABBREVIATIONS

|        |  |
|--------|--|
| ACCD   | Asotin County Conservation District                    |
| ACMWP  | Asotin Creek Model Watershed Plan                      |
| afy    | acre-foot per year                                     |
| BiOp   | Biological Opinion                                     |
| BLM    | Bureau of Land Management                              |
| BOR    | Bureau of Reclamation                                  |
| BPA    | Bonneville Power Administration                        |
| BRT    | Biological Review Team                                 |
| C&S    | ceremonial and subsistence                             |
| CCD    | Columbia Conservation District                         |
| cfs    | cubic feet per second                                  |
| CMS    | comprehensive statewide monitoring strategy            |
| CREP   | Conservation Reserve and Enhancement Program           |
| CRFMP  | Columbia River Fish Management Plan                    |
| CTUIR  | Confederated Tribes of the Umatilla Indian Reservation |
| CWA    | Clean Water Act  |
| DPS    | Distinct Population Segment                            |
| EDT    | Ecosystem Diagnosis and Treatment                      |
| ESA    | Endangered Species Act                                 |
| ESBS   | extended submersible bar screen                        |
| ESU    | Evolutionarily Significant Unit                        |
| EWGMHB | Eastern Washington Growth Management Hearings Board    |
| FCRPS  | Federal Columbia River Power System                    |
| FEMA   | Federal Emergency Management Act                       |
| FPC    | Fish Passage Center                                    |

## ACRONYMS AND ABBREVIATIONS(Continued)

|                |   |
|----------------|---|
| GBD            | gas bubble disease                              |
| GMA            | Growth Management Act                           |
| gpm            | gallons per minute                              |
| GRRU           | Grande Ronde Recovery Unit                      |
| GSRO           | Governor's Salmon Recovery Office               |
| HGM            | hydrogeomorphic method                          |
| HGMP           | Hatchery Genetics Management Plan               |
| HPA            | Hydraulic Project Approval                      |
| HSRG           | Hatchery Scientific Review Group                |
| IBIS           | Interactive Biodiversity Information System     |
| ICTRT          | Interior Columbia Basin Technical Recovery Team |
| IDFG           | Idaho Department of Fish and Game               |
| INFISH         | Inland Native Fish Interim Strategy             |
| JARPA          | Joint Aquatic Resource Permits Application      |
| kcfs           | thousand cubic feet per second                  |
| km             | kilometer                                       |
| LCFRB          | Lower Columbia Fisheries Recovery Board         |
| LFH            | Lyons Ferry Hatchery                            |
| LSRCP          | Lower Snake River Compensation Plan             |
| m <sup>2</sup> | meters squared                                  |
| m/s            | meters per second                               |
| mgd            | million gallons per day                         |
| MPI            | Matrix of Pathways and Indicators               |
| MSA            | major spawning aggregation                      |
| mSA            | minor spawning aggregation                      |

## ACRONYMS AND ABBREVIATIONS(Continued)

|                |   |
|----------------|---|
| MSY            | Maximum Sustain Yield   |
| NMFS           | National Marine Fisheries Service   |
| NOAA Fisheries | National Oceanic and Atmospheric Administration-Fisheries (same agency as NMFS)   |
| NPPC           | Northwest Power Planning Council (now NWPCC)  |
| NWIFC          | Northwest Indian Fisheries Commission   |
| NWPCC          | Northwest Power and Conservation Council (formerly NPPC)  |
| ODFW           | Oregon Department of Fish and Wildlife  |
| OFM            | (State of Washington) Office of Financial Management  |
| OHWM           | ordinary high water mark  |
| PACFISH        | Denotes interim strategies for managing anadromous fish-producing watersheds in eastern Oregon, Washington, Idaho, and California |
| PFC            | Properly Functioning Conditions   |
| PFMC           | Pacific Fisheries Management Council  |
| PIT            | passive integrated transponder  |
| PVA            | Population Viability Analysis   |
| PWC            | Port of Whitman County  |
| RCW            | Revised Code of Washington  |
| RFEG           | Regional Fisheries Enhancement Group  |
| RM             | river mile  |
| RM&E           | Research, monitoring, and evaluation  |
| RSW            | removable spillway weir   |
| RTT            | Regional Technical Team   |
| SAR            | Smolt-to-Adult Return Rate  |
| SCS            | Soil Conservation Service   |
| SEPA           | State Environmental Policy Act  |

## ACRONYMS AND ABBREVIATIONS(Continued)

|       |  |
|-------|--|
| SMA   | Shoreline Management Act                   |
| SRFB  | Salmon Recovery Funding Board              |
| SRSRB | Snake River Salmon Recovery Board          |
| SRSRC | Snake River Salmon Recovery Committee      |
| SRSRP | Snake River Salmon Recovery Plan           |
| SRWRU | Snake River Washington Recovery Unit       |
| STS   | submersible traveling screen               |
| SWSL  | Surface Water Source Limitations           |
| TDG   | total dissolved gas                        |
| TMDL  | total maximum daily load                   |
| TRMWP | Tucannon River Model Watershed Plan        |
| TRT   | technical recovery team                    |
| UPA   | Updated Proposed Action                    |
| USACE | United States Army Corps of Engineers      |
| USDA  | United States Department of Agriculture    |
| USDI  | United States Department of the Interior   |
| USFS  | United States Forest Service               |
| USFWS | United States Fish and Wildlife Service    |
| USGS  | United States Geological Service           |
| UWWRU | Umatilla-Walla Walla Recovery Unit         |
| VBS   | vertical barrier screen                    |
| VSP   | viable salmon population                   |
| WDFW  | Washington Department of Fish and Wildlife |
| WDNR  | Washington Department of Natural Resources |
| WDOE  | Washington Department of Ecology           |

## **ACRONYMS AND ABBREVIATIONS(Continued)**

|       |  |
|-------|--|
| WRIA  | Watershed Resource Inventory Area        |
| WSPD  | Washington State Parks Department        |
| WWCCD | Walla Walla County Conservation District |

## GLOSSARY

|                  |  |
|------------------|--|
| Abiotic          | Non-living   |
| Abundance        | The average number of fish of any life stage in a given stream, watershed, or basin  |
| Age Structure    | For adult anadromous fish, the age at spawning; for juvenile anadromous fish, the age at which they migrate to the ocean   |
| Allele           | A member of a pair or series of genes occupying one specific position (locus) in a specific chromosome   |
| Anadromous       | Fish which are hatched in freshwater, move to saltwater, and return to freshwater to spawn   |
| Anthropogenic    | Caused by humans or originating with humans  |
| Asymptotic       | An asymptote, in mathematics, is a straight line that always approaches, but never meets, a curved line, i.e., a tangent to a curve at infinity.   |
| Bycatch          | Non-targeted fish taken incidentally to a commercial fishery   |
| Channel Incision | The scouring away of the streambed such that a stream erodes itself deeper and deeper into the earth, eventually becoming enclosed between banks that are high enough to wholly contain the stream at all but the highest flows. This streambed erosion or “downcutting” is usually the result of increased water velocity during floods, such as would occur on a stream lacking the riparian brush and trees that would retard the velocity of flood flows by friction and dissipate energy. |
| Descaling        | Removal of scales from fish due to abrasion or other mechanical means; generally leads to disease introduction   |
| Detritus         | Debris that accumulates on stream bottoms. Detritus can be microscopic (microdetritus) or visible to the naked eye (macrodetritus)   |
| Distributary     | A river branch that flows away from the main stream and does not rejoin it   |
| Diversity        | The number of possible life histories exhibited by a population and the robustness of the genetic and environmental conditions that determine life history diversity   |
| Embeddedness     | Refers to the amount of sediment covering gravels on a stream bottom   |

## GLOSSARY (Continued)

|                       |  |
|-----------------------|--|
| Entrainment           | The entry of fish into an irrigation delivery system such as pipes pumping water onto fields   |
| Fallback              | Adult fish which, after ascending a dam (or fishway), move back down below the dam   |
| Fecundity             | The number of eggs per female fish   |
| Flashiness            | The variability in stream flow during a given period of time, e.g., day, week, month. Streams are considered “flashy” when large amounts of precipitation from storms flows through the stream system very rapidly. Flashiness is characterized by large peak flows followed by rapid declines to base flow conditions.  |
| Forebay               | The area immediately in front of a dam   |
| Head-cut              | The erosion of a streambed in an upstream direction. This occurs in response to increased water velocity associated with channel straightening and a consequent increase in channel slope. The erosion continues until the overall slope of the channel has been reduced to the point where equilibrium in terms of sediment transport and deposition has been regained. |
| Heterozygosity        | Pertaining to an animal or plant whose chromosomes contain both genes of a contrasting pair and which, therefore, do not always breed true to type   |
| Impingement           | Striking or being thrown against a screen or other object  |
| Kelts                 | Steelhead that have spawned; characterized by emaciated condition and poor health following a year-long spawning run completed without feeding   |
| Maximum Sustain Yield | The number of spawners that, in the next generation, would produce the largest harvestable surplus of fish   |
| Metapopulation        | A fish population consisting of a number of local populations linked by migrants, thus allowing for recolonization of unoccupied habitat patches after local extinction events   |
| Morphology            | The external appearance of a fish  |
| Non-game Fish         | Fish species which are not normally targeted by sport fishers  |
| Outmigration          | The movement of juvenile salmonids downstream from freshwater rearing areas to the ocean   |
| Parr                  | The stage in anadromous salmonid development between absorption of the yolk sac and transformation to smolt before migration seaward   |

## GLOSSARY (Continued)

|                                 |  |
|---------------------------------|--|
| Phenotype                       | The external appearance of an organism resulting from the interaction of its genetic makeup and the environment  |
| Productivity                    | The maximum number of recruits (adults) produced by a single spawner   |
| Properly Functioning Conditions | Stream habitat conditions that are generally of less quality than those which occurred historically, but sufficient to produce self-sustaining populations of anadromous salmonids with low extinction risk.   |
| Protection                      | Protection involves preserving high quality or productive habitat; or actions (Restoration-Passive) are taken to prevent the further degradation of existing habitat conditions.   |
| Push-up Dam                     | Gravel that is pushed into a berm to divert water into a canal or other water way  |
| Reach                           | A relatively homogeneous section of stream having a repetitious sequence of habitat types and relatively uniform physical attributes such as channel slope, habitat width, habitat depth, streambed substrate, and degree of interaction with the floodplain   |
| Recovery                        | A fish population is considered recovered when the population's productivity and abundance values meet or exceed the viability criteria established by NMFS.   |
| Restoration                     | When applied to salmonid populations, this term means rebuilding a population to a healthy, sustainable, and harvestable level (beyond the level required for de-listing) where treaty trusts/rights and non-treaty harvest needs can be satisfied. Regarding habitat, restoration means returning an ecosystem as closely as possible to its original state.  |
| Restoration – Active            | Active restoration involves a greater emphasis on direct intervention, often within the stream channel itself. Areas targeted for active restoration may also receive passive restoration. Examples of active restoration include engineered restoration of stream channels; engineered log jams and addition of large woody debris; removal or relocation of dikes, levees, and embankments; creation of pools; and hydraulic reconnection of historical side channels.   |
| Restoration – Passive           | Passive restoration includes agreements, ordinances, contracts and other legal actions that lead to reduction of disturbance in the riparian zones and uplands associated with streams. Such measures as Conservation Reserve Enhancement Program (CREP) riparian buffers, conservation easements, land acquisition, and, where appropriate, upland projects designed to reduce sediment delivery and increase filtration are examples of passive restoration. Passive restoration can also be termed “natural healing.” |

## GLOSSARY (Continued)

|                        |  |
|------------------------|--|
| Rill Erosion           | Erosion caused by very small brooks or streams   |
| Scour Pools            | Pools formed on the outside of river bends where velocity is greatest and relatively large pools are scoured close to the outside bank.  |
| Sheet Erosion          | Erosion caused by sheets of water rather than streams  |
| Smolt                  | The seaward migrating stage of juvenile salmonid development   |
| Spatial Structure      | The number and location (distribution) of salmon populations in the ESU or basin   |
| Spring Brook           | A very small stream (usually smaller than a creek) produced by water flowing naturally from rocks or soil  |
| Stock                  | In harvest management, stocks are spawning aggregations with a uniform life history pattern and a relatively constant productivity over all spawning reaches.  |
| Successional Processes | The natural changes, usually expressed by changes in vegetation which occur in the environment over time. For example, a tilled field left fallow will revegetate first with invasive plants, followed by grasses, then small shrubs, and finally large trees. Vegetation associated with the final stage is known as the climax community. This vegetative assemblage persists indefinitely until it is eliminated by some type of disturbance. |
| Sympatric              | Existing in the same region without interbreeding  |
| Trellis                | A trellised drainage is one in which the tributaries enter the mainstream at nearly right angles; also know as a “grapevine” drainage  |

