

Washington Department of Fish and Wildlife

# Steelhead Harvest and Artificial Production Management Plan for Washington State

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**DRAFT**

Acknowledgements

Acronyms

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Executive Summary

- What is the problem or opportunity our process is addressing?
- What is the scope of this plan?
- What is the goal of the plan? ...Vision for the community?
- How does this plan support that goal/vision?
- What were the major findings, conclusions, actions and commitments? (In general for Puget Sound, and by watershed)
- Implementation planning for operational actions and capital projects, what are the priorities, costs and estimated timetable for each action and set of actions?

# 1. Preamble

- What information is necessary to set the stage for our plan?
- What is the problem or opportunity (current condition)? Need/mandate?
- What is the history of our planning effort (WSP & SSP)?
- What is the overall philosophical approach we applied to solve the problem?
- What is the procedural approach for conducting the planning activity? (How did/will SEPA fit?)

## 1.1 Target Audience

- Commissioners, Legislators, NOAA regulators, general public

## 1.2 What's in the plan

- What is the scope of the Plan Document?
- What's NOT included (e.g., habitat analysis and recommendations; outreach and education)

## 2. Plan Vision

- What is the strategy/plan vision; how does it reflect local [subbasin/watershed] policies, legal requirements, local environmental conditions, values and priorities?
- What are the desired future conditions for ecological, social, economic and cultural interests of the region/watershed?
- Why are we not talking about habitat much within this document and why is that OK?

### 2.1 Conservation Objectives

- What are our vision and short and long-term goals for these populations/stocks/groups? (Philosophical guidance)
- What is our desired future biological condition for individual populations? (Note that the specific biological goals will be provided in Chapter 4 of supplemental watershed plans)
- What is our desired future condition for the Diversity of ESUs/DPSs?

### 2.2 Allocation Objectives

- What are the desired / expected social, cultural and economic outcomes from implementing the plan?
- What would the \$ gains or losses to affected economic sectors be from implementing the plan?
- What are the communities' goals for fisheries and non-consumptive uses in their areas?
- What are the social and economic forces that limit or support our vision and goals?
- What are angler preferences for gear and seasons?

### 2.3 Artificial Production Objectives

- "Why have hatcheries?" (general philosophy; harvest, mitigation, etc.)
- HSRG process and outcomes (specifics provided in chapter 5)

### 2.4 Other Ecological / Ecosystem Objectives

- What are ecosystem goals that we are trying to achieve through management of steelhead specifically? (Philosophical position of steelhead within the "ecosystem" of this watershed - placeholder)
- How will this be developed in the future? (placeholder)

### 2.5 Plan Implementation Objectives

- What do we want fisheries to look like?
- Will we use mark-selective fisheries? Why? How? Objectives?
- What considerations will be made for non-conservation-oriented issues when planning fisheries?

### 2.6 Priorities

- What is the gap between current and desired future conditions?
- How will we go about prioritizing among actions? (placeholder)
- How will we address and integrate socio-economic and scientific factors?

### 3. Environmental Setting

#### 3.1 Geographic Bounds of the Planning Area

- Identify and describe the plan's geographic statewide and regional (watershed/subbasin or ESU/DPS) scope
- Planning Area Map(s)

#### 3.2 Regulatory & Policy Framework

- What management programs (regulations, contracts, agreements) are currently in place?
- What is the legal framework under which fishery and hatchery management operate?
- Regulatory Jurisdictions Affecting Fisheries that impact steelhead

##### 3.2.1 Treaties

- 3.2.1.1 Stevens Treaties: U.S. v. Wash., Hoh V. Baldrige, U.S. v. Oregon, etc.
- 3.2.1.2 Pacific Salmon Treaty

##### 3.2.2 Federal

- 3.2.2.1 Pacific Fishery Management Council and the North of Falcon Forum
- 3.2.2.2 ESA
- 3.2.2.3 FCRPS BiOp
- 3.2.2.4 FERC?

##### 3.2.3 Agency Mandate & Implementing Rules

- 3.2.3.1 Legislative mandates - Revised Code of Washington (RCW);
  - Status as "game" fish prohibits nontreaty commercial fisheries....
- 3.2.3.2 Washington Administrative Codes (WACs)
- 3.2.3.3 Fish & Wildlife Commission & WDFW Agency Policies
- 3.2.3.4 Wild Salmonid Restoration Initiative
- 3.2.3.5 Mass marking, Hatchery Reform, and Selective Fisheries

#### 3.3 Socio-political and economic environment

- What historical social, behavioral and cultural values affect these populations/stocks/groups?
- How do existing policies, programs, commitments and regulations affect our overall steelhead management approach or strategy?

##### 3.3.1 Stakeholders

- Stakeholder values and priorities as expressed through public comment.

##### 3.3.2 Value of fisheries

- SEPA "recreation, cultural preservation")
  - 3.3.2.1 Importance to Tribal Culture
    - Commercial, ceremonial, subsistence
  - 3.3.2.2 Economic Value of Recreational Fishery
    - Tourism, etc.

##### 3.3.3 "Built Environment" (if necessary)

- SEPA "energy and natural resources, environmental health, land and shoreline use, housing, aesthetics, light and glare, recreation, historic and cultural preservation, transportation, public services, utilities"

#### 3.4 Ecological Overview

##### 3.4.1 Habitat conditions

- What are the current and habitat conditions affecting the population?

- What habitats are used at which life stages?
- What Habitat Conservation Plans (HCPs) under Section 10 ESA, Section 7 consultations, FERC licenses, mitigation agreements, and other long-term habitat-related agreements affect steelhead populations?
- What are your assumptions concerning ocean conditions, climate, harvest mortality and other factors that occur outside the watershed or ESU?
- What have been/are the key habitat characteristics and processes that most affect (support or threaten) the viability (abundance, productivity, diversity, spatial structure) of each wild fish population?
- What has been/are the effects of hydro dams or other major projects on the viability of wild fish?
- SEPA "Earth, Air, Water, Plants, energy and natural resources, environmental health"

### 3.4.2 Species Interactions and Ecological Relationships

- What other species interact with the population?
- Which other fish or wildlife species directly or indirectly affect the ability of the species to thrive? How?

## 3.5 Fisheries

### 3.5.1 Fishing Gears [description]

- 3.5.1.1 Net gear
- 3.5.1.2 Recreational gear
- 3.5.1.3 Gear conflict & fleet management considerations

### 3.5.2 Fishing Areas [description]

- Fishing Area Maps
- 3.5.2.1 Tribal
- 3.5.2.2 Recreational
- 3.5.2.3 Minimizing Fishing Area Conflict

## 3.6 Sources of Incidental Mortality

- 3.6.1.1 Steelhead Release (non-retention; wild steelhead release)
  - 1.3.6.1.1 Release mortality estimation
  - 1.3.6.1.2 Age- and Size-Selective Effects of Fishing
  - 1.3.6.1.3 Alternative angling gear
- 3.6.1.2 Net fisheries
  - 2.3.6.1.1 Directed at other species
  - 2.3.6.1.2 Net "dropout" estimation
  - 2.3.6.1.3 Tangle nets and other alternative net gears
- 3.6.1.3 Marine Mammal Predation
- 3.6.1.4 Ocean mortality
- 3.6.1.5 Overall Estimated Distribution of Fishing Mortality

## 3.7 Summary of factors supporting or threatening the viability of current populations

- What are the key factors supporting existing populations?
- What are the key factors that cause decline and/or threaten viability?
- What are the current trends of the effects of those factors?
- What factors continue to threaten the viability of populations?
- How do the cumulative benefits and impacts associated with treaties, laws or policies affect steelhead populations?
- Summarize which of these factors will NOT be discussed in this management document or supplements.

## 4. Population Assessment

- What are the key biological characteristics of steelhead?
- What management complexities result from the unique biological characteristics of steelhead?
- What are the current abundance, productivity/growth rate, diversity and spatial structure (i.e. Viable Salmon Population, or VSP, parameters) for each population?
- How do they compare with the historical characteristics of the population?

### 4.1 Population Identification

#### 4.1.1 Population Structure, origin and composition

- What were the historical populations of Steelhead in Washington [in the watershed]?
- What is the current condition of the populations / DPSs?
- How have anthropogenic factors such as hatchery programs and habitat modifications affected population structure?
- What is the source of broodstock for hatchery programs in each region?

### 4.2 Life History

### 4.3 Abundance and Productivity

- What are the (SaSI 2002 or NOAA Biological Review) status ratings for natural populations of steelhead?

#### 4.3.1 Trends in Spawner Abundance and Productivity by Population

- What are the short-term and long-term trends in abundance and productivity of naturally-spawning populations of steelhead?
- What have been the temporal trends in smolt-to-adult return rates and how have these trends affected population performance?
- How has production potential of the population been affected by anthropogenic factors?

### 4.4 Genetic Diversity and Spatial Structure

- How have anthropogenic factors such as habitat modification, fishery management, and artificial production programs affected the diversity and spatial structure of steelhead populations?
- What was the distribution of summer and winter steelhead in each watershed prior to European settlement?
- How has the range of summer and winter steelhead changed from the pre-settlement distribution? What factors caused the change in distribution?

### 4.5 Biological Objectives

#### 4.5.1 Conservation / Spawner Goals

- What are the viability criteria, in terms of abundance, productivity, spatial distribution and genetic diversity?
- What are the conservation objectives we will use to manage fisheries and gauge success of artificial production programs?

#### 4.5.2 Management Periods

- Management is directed at steelhead during what temporal periods? (if relevant)

#### 4.5.3 Key Population Management Recommendations

- What is the relationship between population-scale goals and goals for the entire ESU/DPS?
- What is the expected time frame and significant benchmarks for meeting the goals?
- What are key considerations in measuring achievement of the goals?

## 5. Harvest Management

- What strategies and tools are available to manage steelhead fisheries?
- What changes, if any, must occur in management of harvest to contribute to population health?
- How will changing harvest objectives influence artificial production?

### 5.1 Trends in Historic Catch, and Effort by population

- What are trends in the catch and effort in steelhead fisheries?
- Tables; short narrative if needed

### 5.2 Abundance Forecasting and Season-Setting Processes

#### 5.2.1 Pre-season Planning

- Steps for Application of Management Objectives to Annual Fisheries Planning

##### 5.2.1.1 Preseason Abundance estimation methods/model description

#### 5.2.2 In-Season Management

- Contingencies & regulation implementation

##### 5.2.2.1 Under what circumstances would we modify fisheries?

##### 5.2.2.2 How do we modify fisheries

#### 5.2.3 Post-Season Evaluation

- How will the effectiveness of harvest actions be measured? What are the metrics? How will we report the outcomes?

### 5.3 Fishery Objectives and Distribution of Opportunity

#### 5.3.1 Non-treaty (recreational) fisheries

- Discuss the range of management tools available/appropriate to steelhead fisheries.
- What are angler preferences for distribution of opportunity and fishery strategies?

##### 5.3.1.1 Harvest management Recommendations

- What fishery strategies are recommended?

#### 5.3.2 Treaty fisheries

- Discussions of treaty fishery objectives will be presented in supplemental watershed plans.

### 5.4 Management Trade-offs

- What are the tradeoffs among management choices?
- What science and socio-economic considerations are instrumental in choosing fishing strategies?

#### 5.4.1 Treaty/Nontreaty Allocation/Sharing Principles

#### 5.4.2 Balancing community needs

#### 5.4.3 [Etc.]

## 6. Artificial Production Strategy

- What are the types of hatchery programs currently operated for steelhead in Puget Sound?
- How can hatchery supplementation programs support or threaten recovery?
- How can/does mass marking support or threaten recovery?

### 6.1 Program Description

#### 6.1.1 Purpose and Goals for Steelhead Programs [in Washington] [in the watershed]

#### 6.1.2 Facilities Overview

#### 6.1.3 [Statewide] [Watershed-Specific] Production Practices

- Transfers; broodstock; timing
- Release/trapping practices
- Disease policy
- Major changes in production strategies

#### 6.1.4 Program Background - Where have we been?

- Table of historic artificial production programs; levels; broodstock

#### 6.1.5 Current Production Program

- Table of current artificial production programs; levels; broodstock (Statewide=general; watershed=specific)

### 6.2 Biological Considerations

- How has/do current artificial production programs and facilities support steelhead populations/stocks/groups?
- How has/do current artificial production programs and facilities affect the viability of wild fish?

#### 6.2.1 Survival

- What has been the survival rate of the juveniles released?

#### 6.2.2 Genetic Effects

- What is the fitness (or adult-to-adult survival) of naturally-spawning steelhead of hatchery origin relative to the indigenous population?
- What are the potential genetic and ecological effects of artificial production on natural populations?

#### 6.2.3 Competition and predation

#### 6.2.4 Operational Considerations / Facility Effects

- How does hatchery effluent or the release of diseased fish affect the prevalence or severity of disease in natural populations? [7 paragraphs from SSP]

### 6.3 Artificial Production Actions and Effects

- What changes, if any, to hatchery programs and facilities are necessary to support recovery?

#### 6.3.1 HSRG Facility Recommendations

#### 6.3.2 Wild Management Zones

#### 6.3.3 Kelt Reconditioning

#### 6.3.4 Other Recommendations

#### 6.3.5 Action Plan

- Priorities, schedule, estimated costs (i.e. operational and capital facilities planning) provided in supplemental watershed/regional plans.

## 7. Integrated Management Strategies

➤ Cut and Paste section from SSP

### 7.1 Recommended implementation steps

7.1.1 Population Management

7.1.2 Harvest

7.1.3 Artificial Production

## 8. Plan Implementation

### 8.1 Information Gaps - Research Plan

- What scientific knowledge (or lack thereof) limits or supports our vision and goals?
- Identification of Uncertainties & Information Gaps -Research Plan
- What are the key biological and/or policy unknowns or uncertainties?
- What are the key information gaps?
- What is the plan to fill those gaps?

### 8.2 Fishery monitoring

#### 8.2.1 Fishery Performance Measures

#### 8.2.2 Catch estimation methodologies

##### 8.2.2.1 Sport (CRC v. creel)

##### 8.2.2.2 Commercial

##### 8.2.2.3 Potential Improvements in Methodologies

#### 8.2.3 Operational Fishery Monitoring Plans

### 8.3 Population Monitoring

#### 8.3.1 Population Performance Measures

#### 8.3.2 Spawner Abundance Estimation Methodologies

##### 8.3.2.1 Potential Improvements in Methodologies

#### 8.3.3 Spawning Ground Survey Methodologies

##### 8.3.3.1 Potential Improvements in Methodologies

#### 8.3.4 Biological Sampling Goals

- How many scales or genetic samples need to be taken in order to provide meaningful information? In fisheries? From hatcheries? From spawning grounds?

### 8.4 Artificial Production Monitoring

- How will the effectiveness of the action be measured?

#### 8.4.1 Production Performance Measures

#### 8.4.2 Hatchery Rack Escapement Estimation methodologies

#### 8.4.3 Survival estimation

#### 8.4.4 Disease?

### 8.5 Enforcement

- What laws need better enforcement?
- How can that better enforcement be provided?
- What motivational programs can be initiated to increase compliance with laws?

### 8.6 Adaptive Management Plan

- How will we measure the progress and success of our plan?
- What types of monitoring will occur (and what metrics employed) to measure effectiveness of the recovery plan?
- How will we use monitoring results to adapt the plan?
- How is this monitoring plan consistent with the statewide monitoring program?

- What steps are we taking to ensure that adaptive management continues to occur at appropriate scales?  
(Include the strategy for integrated decisionmaking across the H's.)

8.6.1 Annual Evaluation

8.6.2 Mechanics for Modifying the Plan

## Technical Appendices / References

A. Glossary

B. References and Data Sources

C. Analysis Tools

- What analysis tools and data sources were employed, and why were those tools/sources chosen?

# Supplemental Puget Sound Steelhead Harvest and Artificial Production Management Plan

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## 1. Introduction [rollup]

## 2. Action Plan [rollup]

- What is the specific set of harvest and artificial production actions that we commit to implement in order to contribute to protection and/or recovery of populations?
- Have all major threats identified in the assessments been addressed through actions in this plan?
- What measures are needed to continue protection for geographies that currently support salmon populations?
- Why was each set of actions chosen?
- What are the linkages among different sets of actions occurring in salmon recovery?
- How does each set of actions target the causes for decline as well as symptoms of decline?
- What are the individual and cumulative benefits to fish from this action plan?
- What are the costs and estimated timetable for each action and set of actions?
- Who is responsible to implement each set of actions?

### 2.1 Programmatic Actions [rollup]

- Should/How can HCPs, Section 7 consultations, FERC agreements, mitigation agreements, and other long-term agreements be adapted/improved to better meet the plan goals?

### 2.2 Population Management Actions [rollup]

- Actions by population / watershed

### 2.3 Harvest Management Actions [rollup]

- Actions by population / watershed

### 2.4 Artificial Production Actions [rollup]

- Actions by population / watershed

## 3. Implementation considerations

### 3.1 Enforcement Actions [rollup]

### 3.2 Prioritizing, Financing, and Sequencing

#### 3.2.1 Recap Relating to Operational Budget

#### 3.2.2 Recap Relating to Capital Budget

## 4. Consistency with Statewide Plan

- How is this regional supplement consistent, or not consistent, with the statewide plan?

## 5. Watershed Chapters

5.1 Nooksack-Samish

5.2 Skagit

5.3 Stillaguamish

5.4 Snohomish

5.5 Central Puget Sound (Lake Washington, Cedar, Green)

5.6 Puyallup

5.7 Nisqually

5.8 Deep South Puget Sound Tributaries (WRIAs 12-15)

5.9 Hood Canal (WRIAs 16, 17)

5.10 Eastern Strait of Juan de Fuca (WRIA 18)