

Washington Department of Fish and Wildlife  
Puget Sound Treaty Indian Tribes

# Puget Sound Steelhead Management Plan Harvest and Artificial Production Components

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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, enforcement)

## 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?

### 2.1.1 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)
- What is our desired future condition for the Diversity of the ESU?

### 2.1.2 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?

### 2.1.3 Artificial Production Objectives

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

### 2.1.4 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)

### 2.1.5 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?

### 2.1.6 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 (watershed/subbasin or regional/ESU) 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
- 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

#### 3.2.3 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 North of Falcon Policies
- 3.2.3.5 Wild Salmonid Restoration Initiative
- 3.2.3.6 Mass marking, Hatchery Reform, and Selective Fisheries

### 3.3 Socio-political and economic environment

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

#### 3.3.1 Stakeholders

#### 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.

### 3.4 Habitat Overview / Environmental Conditions

#### 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 and other long-term 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

#### 3.5.1.1 Net gear

#### 3.5.1.2 Recreational gear

- What are angler preferences for gear and regulations?

#### 3.5.1.3 Gear conflict & fleet management considerations

### 3.5.2 Fishing Areas

- Fishing Area Maps

#### 3.5.2.1 Tribal

#### 3.5.2.2 Recreational

#### 3.5.2.3 Minimizing Fishing Area Conflict

### 3.5.3 Sources of Incidental Mortality

#### 3.5.3.1 Steelhead Release (non-retention; wild steelhead release)

##### 1.3.5.3.1 Age- and Size-Selective Effects of Fishing

#### 3.5.3.2 Net fisheries directed at other species

#### 3.5.3.3 Ocean mortality

#### 3.5.3.4 Overall Estimated Distribution of Fishing Mortality

## 3.6 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?
- What are the key unknowns or uncertainties?
- How do the cumulative benefits and impacts associated with treaties, laws or policies affect steelhead populations?
- How will changes in one “H” factor affect the other “H” factors?
- Summarize which of these factors will NOT be discussed in this management document

## 4. Population Assessment

- What are the key biological characteristics of steelhead?
- What management complexities result from the unique biological characteristics of steelhead?
- What is the current condition of the population?
- What were the historical populations?
- 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 Puget Sound [watershed]?
- 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 be affected by anthropogenic factors?

##### 4.3.1.1 Spawner Abundance Estimation Methodologies

#### 4.3.2 Extinction Risk

- What is the relative extinction risk of each population?

### 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 Management Trade-offs

#### 5.2.1 Treaty/Nontreaty Allocation/Sharing Principles

#### 5.2.2 Balancing community needs

#### 5.2.3 Etc. (SSP)

### 5.3 Abundance Forecasting and Season-Setting Processes

#### 5.3.1 Pre-season Planning

- Steps for Application of Management Objectives to Annual Fisheries Planning

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

#### 5.3.2 In-Season Management

- Contingencies & regulation implementation

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

##### 5.3.2.2 How do we modify fisheries

#### 5.3.3 Post-Season Evaluation

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

### 5.4 Fishery Objectives and Distribution of Opportunity

- What trade-offs are made (between science and socio-economic considerations) in choosing strategies?

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

#### 5.4.2 Treaty fisheries

## 6. Artificial Production Strategy

- What are the types of hatchery programs currently operated for steelhead in Puget Sound?

### 6.1 Program Description

#### 6.1.1 Program Purpose and Goals

#### 6.1.2 Program Facilities

#### 6.1.3 Production Practices

- Transfers; broodstock; timing
- Release/trapping practices

#### 6.1.4 Program background

- Table of historic artificial production programs; levels; broodstock

#### 6.1.5 Current Production Program

- Table of current artificial production programs; levels; broodstock

### 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?

### 6.3 Artificial Production Actions and Effects

- What changes, if any, to hatchery programs and facilities are necessary to support recovery?
- How will those changes affect harvest (and habitat)?
- How will the effectiveness of the action be measured?
- How can hatchery supplementation programs support or threaten recovery?
- How can/does mass marking support or threaten recovery?

#### 6.3.1 HSRG Facility Recommendations

#### 6.3.2 Wild Management Zones

#### 6.3.3 Other Recommendations

#### 6.3.4 Action Plan

- Priorities, schedule, estimated costs (i.e. operational and capital facilities planning)

## 7. Plan Implementation

### 7.1 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?

### 7.2 Fishery monitoring

#### 7.2.1 Catch estimation methodologies

##### 7.2.1.1 Commercial

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

#### 7.2.2 Potential Improvements in Methodologies

#### 7.2.3 Operational Fishery Monitoring Plans

### 7.3 Population Monitoring

#### 7.3.1 Spawning Ground Survey Methodologies

#### 7.3.2 Operational Survey Plans

#### 7.3.3 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?

### 7.4 Artificial Production Monitoring

#### 7.4.1 Escapement Estimation methodologies

#### 7.4.2 Survival estimation

#### 7.4.3 Disease?

#### 7.4.4 What else?

### 7.5 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.)

#### 7.5.1 Annual Evaluation

#### 7.5.2 Mechanics for Modifying the Plan

### 7.6 Endorsements

- Signatures of the parties to the plan (placeholder for watershed chapters - maybe rollup)

## 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?

Puget Sound Steelhead Management Plan  
Harvest and Artificial Production Components  
Watershed Sections

11. Nooksack-Samish
12. Skagit
13. Stillaguamish
14. Snohomish
15. Central Puget Sound (Lake Washington, Cedar, Green)
16. Puyallup
17. Nisqually
18. Deep South Puget Sound Tributaries (WRIAs 12-15)
19. Hood Canal (WRIAs 16, 17)
20. Eastern Strait of Juan de Fuca (WRIA 18)