

# **Washington Department of Fish and Wildlife Statewide Steelhead Management Plan**

**Volume 1. Statewide Policies, Strategies, and Actions**

**Draft  
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# EXECUTIVE SUMMARY

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## INTRODUCTION

The Washington State fish, steelhead, is an icon of the Pacific Northwest and has been a source of important cultural and economic benefits throughout the region's history. Although once abundant throughout much of the state, substantial variation now exists among the status of steelhead stocks. More than 90 percent of the steelhead runs on the Olympic Peninsula are healthy, but all natural steelhead stocks on the Columbia and Snake rivers have been listed for protection under the federal Endangered Species Act (ESA) since the late 1990s.

To restore and preserve this important resource, the Washington Department of Fish and Wildlife (WDFW) initiated a multi-step process to improve the management and status of steelhead in Washington. The initial step in this process was to lay the scientific foundation for the subsequent development of improved management plans. Drawing on decades of research and new analyses, a comprehensive review of steelhead in Washington was published in the report "*Oncorhynchus mykiss: Assessment of Washington State's Anadromous Populations and Programs*". The report concluded with numerous findings and recommendations to guide future management actions.

Building on this foundation, this plan provides a framework of policies, strategies, and actions for application throughout the state. Recognizing that substantial variation exists in the status of stocks, habitat conditions, and that tribal, local, and federal authorities vary across the state, our objective in this plan is not to provide prescriptive requirements. Rather, we have sought to describe our vision for the future of the steelhead of Washington, and broad strategies and actions to promote achievement of that vision.

The final step in the development of the statewide steelhead management plan will be the completion of regional plans that describe specific management actions at a watershed and stock-specific scale. The completed statewide plan will include eight volumes that provide a comprehensive, improved management plan for Washington steelhead stocks.

- Volume 1. Statewide Policies, Strategies, and Actions
- Volume 2. Puget Sound Resource Management Plan
- Volume 3. Olympic Peninsula Resource Management Plan
- Volume 4. Southwest Washington Resource Management Plan
- Volume 5. Lower Columbia Resource Management Plan
- Volume 6. Mid-Columbia River Resource Management Plan
- Volume 7. Upper Columbia River Resource Management Plan
- Volume 8. Snake River Resource Management Plan

Avoiding listings under the ESA would be an important result of the implementation of the Statewide Steelhead Plan. However, keeping stocks from the brink of extinction to avoid ESA listings falls substantially short of the purposes of this plan. The purpose of this plan will not only be to keep stocks from extinction, but to maintain them at healthy levels that can provide a variety of harvest, cultural, ecological, and other benefits.

Many of the regional plans will be developed with appropriate Indian tribes. The U.S. Government recognizes twenty-five tribes as parties of the Stevens-Palmer Treaties. Twenty-four tribes have usual and accustomed fishing places within the boundaries of the State of Washington. In addition, there are nine federally recognized tribes that are not party to one of the Stevens-Palmer treaties. The overlapping nature of the tribes and state jurisdictions and authorities creates a co-management relationship because the WDFW and the respective tribes have certain authorities that potentially pertain to the fisheries resource. As a result, there is a need for the state and the tribes to cooperate in the discharge of their respective authorities. To minimize potential conflict, and to promote effective and efficient management of fisheries resources that are subject to both state and tribal management, the Department and tribes have developed a cooperative management approach to exercise their respective authorities and to achieve our shared conservation objectives. This cooperative management will be reflected in the individual watershed level plans with the respective tribes.

## GOAL AND POLICIES

The purpose of the Statewide Steelhead Management Plan is to provide a framework of policies, strategies, and actions that will lead to achievement of our goal for the steelhead stocks and fisheries of Washington:

**Restore and maintain the abundance, distribution, diversity and long-term productivity of Washington's natural-origin steelhead and their habitats to assure healthy stocks. In a manner consistent with this primary goal, the Department will seek to protect and restore steelhead to achieve cultural, economic, and ecosystem benefits for current and future residents of Washington State.**

The WDFW will seek to achieve this goal through implementation of the following policies:

- ***Natural Production:*** Steelhead management will prioritize the protection of naturally produced steelhead stocks and restoration of these stocks to healthy levels.
- ***Habitat Protection and Restoration:*** WDFW will seek to maintain and increase the quality, quantity, and productivity of freshwater and marine habitat necessary to sustain and restore healthy steelhead stocks.
- ***Fishery Management:*** Fisheries will be designed and implemented to meet the conservation objectives of natural production, provide diverse consumptive and non-consumptive opportunities, meet tribal harvest sharing obligations, and assure compliance with state and federal requirements.
- ***Artificial Production:*** Policies are established for two types of artificial production programs:
  - Harvest Programs. Artificial production programs implemented to enhance harvest opportunities will provide substantial, cost-effective fishery benefits while meeting watershed-specific goals for the diversity, spatial structure, productivity, and abundance of natural stocks.
  - Conservation Programs. Artificial programs implemented with a conservation objective will have a net benefit to the diversity, spatial structure, productivity, and abundance of the target natural stock.
- ***Regulatory Compliance:*** Provide adequate resources to effectively gain compliance with habitat conservation and fishery management regulations.
- ***Monitoring, Evaluation, and Adaptive Management:*** Implement monitoring, evaluation and adaptive management to assess and improve the effectiveness of management and hatchery actions to protect the diversity and productivity of naturally produced stocks and the habitat they rely on.

- **Research:** Implement steelhead research to guide management decisions on critical steelhead issues based on best science available.
- **Outreach and Education:** Implement outreach and education programs to ensure Washington's citizens value, support and have the information and opportunities necessary to participate in the restoration and protection of steelhead and their habitats.

# NATURAL PRODUCTION

## Policy Statement

**Steelhead management will prioritize the protection of natural steelhead stocks and restoration of these stocks to healthy levels.**

A healthy natural stock has sufficient abundance, productivity, diversity and spatial structure to be resilient through environmental fluctuations, to perform natural ecological functions in freshwater and marine systems, provide related cultural values to society, and sustain tribal and recreational fisheries.

## Strategies

- ***Enhance and Maintain Diversity of Natural Stocks.*** Evaluate and modify management actions to promote local adaptation, increase and maintain the diversity within and among stocks, and sustain and maximize the longterm productivity of natural stocks.
- ***Provide Sufficient Spawners.*** Provide sufficient diversity and numbers of naturally spawning steelhead to promote levels of diversity, spatial structure, productivity, and abundance consistent with a healthy stock.
- ***Manage from Ecosystem Perspective.*** Restore and maintain salmonid stocks and other indigenous aquatic species to levels that sustain healthy ecosystem processes, including food web links to natural stocks of steelhead.
- ***Describe Path to Longterm Goal.*** Evaluate the factors limiting the health of stocks that are listed under the Endangered Species Act or have a SaSI status of Critical or Depressed. Identify a longterm goal for the diversity, spatial structure, productivity, and abundance of each stock, and a path with the modifications to fishery, hatchery, and habitat management necessary to achieve that goal.

## Actions

- 1) Prevent the loss of steelhead stocks through careful review and implementation of improved harvest, hatchery, and habitat management strategies.
- 2) Establish longterm goals for each natural stock describing healthy levels of abundance, diversity, productivity and spatial structure.
- 3) For healthy stocks of steelhead, the escapement policy will be to provide at least the number of natural spawners necessary to achieve the maximum sustainable harvest (MSH). An escapement objective greater than the MSH level may, if necessary, be developed to achieve diversity and spatial structure objectives, address uncertainties in management, or to test assumptions about stock productivity.
- 4) For stocks with a depressed, critical, or ESA-listed status, the escapement policy will be to promote a trend of increasing numbers of naturally spawning fish to achieve healthy stocks.

- 5) Develop a “natural stock rescue” reference document that discusses the conditions under which a hatchery conservation program may be warranted and the key questions that should be addressed during the development of the program.

# HABITAT PROTECTION AND RESTORATION

## Policy Statement

**WDFW will seek to maintain and increase the quality, quantity, and productivity of freshwater and marine habitat necessary to sustain and restore steelhead stocks.**

Habitat here is used in its broadest, ecological sense that includes freshwater, estuarine, marine functions as well as the important components such as water quality and quantity, marine nutrients and forage fish. Suitable and sufficient habitat is a critical requirement for maintaining healthy naturally produced steelhead stocks.

While WDFW does not have significant regulatory authority in the protection of habitat, through technical assistance, implementation of the hydraulic permit program, and exercising our authority under the Federal Power Act, staff will work to advance the protection and restoration of functional habitat.

## Strategies

- ***Encourage Local Problem Solving.*** Encourage local problem solving with participation by local citizens, the tribes, and state, local, and federal agencies in the development and implementation of improved strategies for habitat protection and restoration.
- ***Provide Technical Expertise.*** Ensure that the technical expertise of WDFW is available to local planning groups and governments to assist in the identification of the habitat factors limiting the health of steelhead stocks and actions to achieve desired protection and restoration outcomes.
- ***Facilitate Access to Information.*** Promote effective salmon recovery by providing web access to a cohesive set of tabular and map-based habitat information, including watershed utilization by steelhead and priorities for protection and restoration.
- ***Promote Comprehensive Watershed Approach.*** Work with local and regional habitat managers and salmon recovery groups at the watershed level to assess, protect, and restore habitat using a comprehensive, watershed-based approach that stresses the continuum that extends throughout the watershed, its estuary, and near shore marine waters.
- ***Implement Hierarchy of Protection and Mitigation Approaches.*** Recognizing that at some times the needs of society will result in habitat degradation, the agency will pursue the following hierarchy of approaches to minimize the effects to steelhead stocks:
  - 1) Avoiding the impact altogether by not taking a certain action or parts of an action.
  - 2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
  - 3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

- 4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
  - 5) Compensating for the impact by replacing or providing substitute resources or environments.
  - 6) Monitoring the impact and taking appropriate corrective measures to achieve the identified goal.
- ***Develop Guidance for the Lead Entity and Regional Fisheries Enhancement Group (RFEG) Programs to Assist in Habitat Restoration for Steelhead.*** Identification of important steelhead habitat characteristics can assist in developing and prioritizing habitat restoration projects that will benefit steelhead.

## **Actions**

- 1) Enhance the ability of local planning groups to effectively pursue new funding opportunities and efficiently use existing fund sources by developing a web application that identifies a schedule of priority habitat protection areas and restoration projects.
- 2) Use the Federal Energy Regulatory Commission (FERC) as a vehicle to negotiate with power project owners to improve habitat for steelhead.
- 3) Negotiate with action agencies to improve survival of steelhead through federal facilities on the Columbia River system.
- 4) Through a recently initiated project to evaluate the feasibility of developing a habitat conservation plans for the Hydraulic Project Approval (HPA) program, and for WDFW owned and managed wildlife areas: a) assess the potential impacts of WDFW land management activities on steelhead; b) assess the potential impacts of HPA-permitted activities on steelhead; c) evaluate potential conservation measures to fully mitigate for adverse impacts resulting from HPA-permitted activities; d) identify HPA-permitted activities that will require new research or monitoring efforts to assess impacts and potential mitigation measures; and e) develop tools and strategies to facilitate the monitoring, tracking, and adaptive management of HPA-permitted activities.
- 5) Work with the RFEG Citizen Advisory Board to develop criteria that can be used to assist in identifying projects for funding that provide a benefit to steelhead.

# FISHERY MANAGEMENT

## Policy Statement

**Fisheries will be designed and implemented to meet the conservation objectives of natural production, provide diverse consumptive and non-consumptive opportunities, meet tribal harvest sharing objectives, and assure compliance with state and federal requirements.**

The Department promotes the effective and efficient management of steelhead resources subject to state and tribal management and authority through joint planning, explicit definition of fishery objectives, and maintenance of consistent stock assessment and catch information for use by WDFW, the affected Indian tribes, other states, and the National Oceanographic and Atmospheric Administration (NOAA).

## Strategies

- ***Promote Selective Harvest.*** Promote the use of fishing methods and regulations that focus harvest on hatchery-origin steelhead and protect naturally produced steelhead.
- ***Develop Comprehensive All-H Strategy.*** Develop and implement comprehensive hatchery, habitat, hydro, and harvest management plans that describe fishery management strategies within an “All-H” context.
- ***Manage Fisheries Consistent with Natural Production Strategies.*** Design, implement, and evaluate fishery management to assure consistency with the natural production policy and strategies in this plan.
- ***Account for all Sources of Fishery Related Mortality.*** Incorporate all sources of fishing related mortality, including the mortality of steelhead caught and released, in fishery management.
- ***Describe Path to Longterm Goal.*** Evaluate the current benefits and risks of the fishery management program, the longterm goal for the management program, and (if different) a path from the current program to the longterm goal. For fishery management affecting natural stocks of importance for conservation and recovery, the longterm goal will include the following elements:
  - Implementation of fisheries will not substantively affect the diversity or spatial structure of natural stocks.
  - Implementation of fisheries will not substantively increase the risk of extinction of natural stocks.
- ***Provide Diverse Fishing Opportunities.*** Assure that the diverse interests of the recreational fishing community are addressed by providing both retention and catch and release fishing opportunities.
- ***Adaptively Manage Fisheries.*** Adaptively manage fisheries to assure that region-wide conservation and recovery goals are achieved and fishing-related economic and cultural benefits are maximized.

## Actions

- 1) Protect juvenile steelhead and resident rainbow trout by closing fisheries during the spring, smolt migration period and through the use of minimum size and bag limits during periods when the fisheries are open.
- 2) Work with the affected Indian tribes, on a watershed by watershed basis, to obtain annual state-tribal harvest management plan agreements that include shared conservation, hatchery augmentation, and harvest sharing objectives for state and tribal fisheries.
- 3) Assess the current benefits and risks of each fishery relative to the potential effects on the diversity, spatial structure, productivity, and abundance of natural stocks. Several key risk factors to consider are discussed below.
  - a. Diversity. Evaluate the potential selective effects on natural stocks of fisheries targeting hatchery stocks with a different run timing or spatial distribution. Fisheries targeting Chambers Winter or Skamania Summer hatchery stocks are two examples of these fisheries. Modify the timing of fisheries, gear types, or fishery characteristics that result in losses in diversity that are not consistent with watershed goals.
  - b. Abundance. Evaluate the effects of fishery harvest rates established for management units on the abundance of the constituent stocks. Reduce fishing harvest rates if the long-term abundance of each stock is inconsistent with watershed goals.
- 4) Describe in fishery management plans the expected short- and longterm effects of the fishery on the diversity, spatial structure, productivity, and abundance of the natural stock.
- 5) Manage all recreational steelhead fisheries to meet natural stock escapement objectives and hatchery broodstock requirements. Wild steelhead release (WSR), closed seasons or closed areas will be implemented as appropriate to regulate the recreational fishery. Guidelines for fisheries targeting the adult steelhead are described in the following management scenario table:

Abundance of Hatchery Management Unit	Abundance of Natural Management Unit (MU)	
	<u>Less than</u> Natural MU escapement objective	<u>Greater than</u> Natural MU escapement objective
<u>Less than</u> Hatchery MU escapement objective	<ul style="list-style-type: none"> <li>• Close all recreational steelhead fisheries.</li> </ul>	<ul style="list-style-type: none"> <li>• Recreational fisheries will target utilization of naturally produced fish.</li> </ul>
<u>Greater than</u> Hatchery MU escapement objective	<ul style="list-style-type: none"> <li>• Fishery related mortality rate not to exceed 10% for all fisheries, or the ESA fishery permit limit.</li> <li>• Implement WSR until the end of the hatchery steelhead management period.</li> </ul>	<ul style="list-style-type: none"> <li>• Recreational fishery opportunities will be provided for both hatchery and naturally produced fish.</li> </ul>

- 6) Compute the total fishery related mortality in steelhead fisheries. As a precautionary measure, assume and apply a release mortality rate of 10% for all steelhead caught and released by recreational fishers.
- 7) Conservatively manage naturally produced stocks where run sizes, escapements, and status cannot be readily estimated.
- 8) Provide recreational fishers with two general types of fishing opportunities:
  - a. Retention: Retention fisheries will allow the opportunity to catch and retain hatchery and/or naturally produced fish that are more abundant than the escapement objective.
  - b. Catch-and-Release: Catch-and-release fisheries will be used to maximize the opportunity to catch and release steelhead (or catch rate) and provide extended fishing periods for hatchery and/or naturally produced fish that are more abundant than the escapement objective. Catch-and-release fisheries can be targeted on hatchery or naturally produced fish but they must be consistent with natural fish protection guidelines. WSR fisheries are a special case of catch-and-release fisheries in which unmarked steelhead are released and the intent is to allow the harvest of hatchery fish during a targeted catch and release opportunity for naturally produced fish. "Selective Fishery Rules," as described in the fishing pamphlet, will apply to all catch-and-release fisheries.
- 9) Distribute recreational fishing opportunities between retention and catch-and-release based upon testimony received at Fish & Wildlife Commission meetings, letters to WDFW, angler preference surveys, and other methods for determining the preferences of the recreational fishing community. Angler preference surveys should be conducted at least every five years<sup>1</sup>.
- 10) Document the adaptive management plan for each fishery, including the monitoring and evaluation necessary to determine whether the fishery management program is meeting its objectives as well as a process for making revisions to the program.

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<sup>1</sup> The last preference survey was conducted in 2001. In a scenario in which the abundance of the natural steelhead stock exceeded the escapement objective, 60.8% of the anglers surveyed indicated a preference to release natural steelhead. Since most anglers presently participating in the steelhead fishery prefer not retaining natural produced steelhead, the majority of fishing opportunity for naturally produced fish is currently provided through catch-and-release fisheries.

## ARTIFICIAL PRODUCTION

### Policy Statement

**Harvest Programs.** Artificial production programs implemented to enhance fishing opportunities (retention or catch-and-release) will provide substantial, cost-effective fishery benefits while meeting watershed-specific goals for the diversity, spatial structure, productivity, and abundance of natural stocks.

**Conservation Programs.** Artificial programs implemented with a conservation objective will have a net benefit to the diversity, spatial structure, productivity, and abundance of the target natural stock.

### Strategies

- ***Establish Network of Natural Stock Reserves.*** Establish a network of natural stock reserves (e.g., Wild Steelhead Management Zones (WSMZs)) across the state where natural stocks are largely protected from the effects of hatchery programs.
- ***Mark all Artificial Production.*** Mark all fish released from artificial production programs to evaluate program risks and benefits.
- ***Develop Comprehensive All-H Strategy.*** Develop and implement comprehensive hatchery, habitat, hydro, and harvest management plans that describe and link artificial production program strategies to the strategies for other Hs (i.e., “All-H” context).
- ***Manage from Ecosystem Perspective.*** Design, operate, and evaluate artificial production programs from an ecosystem perspective, rather than as an isolated fish production factory, and assess genetic, demographic, and ecological risk factors.
- ***Describe Path to Longterm Goal.*** Evaluate the current benefits (biological and fishery) and risks of each artificial production program, the longterm goal for the program, and (if different) a path from the current program to the longterm goal. For programs affecting natural stocks of importance for conservation and recovery, the longterm goal will include the following elements:
  - integrated programs implemented to enhance harvest opportunities (i.e., integrated harvest program) will achieve a proportion natural influence (PNI) of greater than 0.70, use hatchery practices that reduce the risks of domestication, and use broodstock that is indigenous to the watershed.
  - segregated programs implemented to enhance harvest opportunities (i.e., segregated harvest program) will result in a gene flow of less than 2% from the hatchery to the natural stock, use broodstock that originated from releases of juveniles at that facility, and result in minimal ecological effects.
- ***Implement Rescue Programs for At-Risk Stocks.*** Maintain at-risk natural stocks by implementing rescue programs such as kelt reconditioning and hatchery conservation programs until limiting factors are addressed.
- ***Adaptively Manage Programs.*** Adaptively manage artificial production programs to assure that region-wide conservation and recovery goals are achieved and fishing-related economic and cultural benefits are maximized.

## **Actions**

- 1) Do not release hatchery-origin rainbow trout in rivers and lakes accessible to steelhead.
- 2) Select either an integrated or segregated reproductive strategy for the operation of each hatchery program based upon watershed goals, program objectives (harvest, conservation, research, or education), facility capabilities, and a scientific assessment of the potential risks and benefits of an integrated or a segregated strategy.
- 3) Manage the collection of broodstock for Chambers Winter and Skamania Summer programs to maintain or increase the difference in spawn timing with natural steelhead stocks.
- 4) Assess the current risks and benefits of each artificial production program relative to genetic, demographic, and ecological risk factors. Key factors to include in the risk assessment for each type or program are discussed below.
- 5) Segregated Harvest Programs. Two key risks associated with segregated harvest programs are a potential loss of diversity (within and between stocks) and competition.
  - a. Evaluate the potential range of gene flow from returning adults of hatchery-origin to natural stocks in all watersheds where Chambers Winter or Skamania Summer type steelhead are released, or where a segregated program has been in place for three or more generations.
  - b. Evaluate the potential effects of competition of hatchery-origin juveniles, adults, and the progeny of naturally spawning adults with natural stocks for all natural stocks that are listed under the ESA, or have a SaSI status of Critical or Depressed.
  - c. Where risks are inconsistent with watershed goals, implement one or more of the following actions: 1) release steelhead juveniles from segregated programs only at locations where returning adults can be captured; 2) adjust the program size, release location, fishery harvest rate, or other factor to achieve an acceptable rate of gene flow; 3) eliminate the program; or 4) replace the segregated program with an integrated program with risks that are consistent with watershed goals.
- 6) Integrated Harvest Programs. Three key risk factors associated with integrated harvest programs are a loss of diversity, domestication, and a reduction in the number of natural-origin spawners.
  - a. Use broodstock that originated from the stock that inhabits the area of the watershed in which the juveniles will be released or, if the native stock has been extirpated, a stock with morphological, life history, and genetic characteristics similar to the extirpated stock.
  - b. Evaluate the PNI, potential range of changes in stock productivity, and demographic risks and benefits. Where risks are inconsistent with watershed goals, modify the size, fish culture practices, release strategy, or other characteristics of the program, reduce fishery harvest rates on natural-origin steelhead and increase fishery harvest rates on hatchery-origin steelhead, and/or enhance the productivity of the natural habitat.
- 7) Describe each artificial production program in an operational plan that documents the program objectives, performance objectives and indicators, specific operational components, measures to control risks, monitoring and evaluation, and adaptive management process.

- 8) Document the adaptive management plan for each artificial production program, including the longterm goal for the program, a sequence (path) of program modifications to achieve the longterm goal, the monitoring and evaluation necessary to determine whether the program is meeting its objectives, and a process for making revisions to the program.

## REGULATORY COMPLIANCE

### Policy Statement

**Provide adequate resources to effectively gain compliance with habitat conservation and fishery management regulations.**

Gaining compliance with existing and future regulations is essential in protecting and maintaining important habitat functions as well as ensuring that fishery protection strategies are followed. WDFW will utilize both voluntary (such as technical assistance, public outreach, cooperative partnerships) and regulatory approaches to improve compliance with habitat and fishery regulations.

### Strategies

- ***Promote Understanding of Enforcement Concerns.*** Promote improved understanding of the compliance concerns of fishery and habitat managers and the issues facing fish and wildlife officers.
- ***Increase Penalties Associated with Noncompliance.*** Increase the consequences associated with noncompliance by increasing the fines for illegal actions.
- ***Implement Improved Compliance Strategies.*** Improve compliance with existing regulations through the development, testing, and implementation of innovative techniques such as outreach programs and law enforcement emphasis patrols.
- ***Increase Enforcement Presence in Fishery Areas that have ESA Listed Fish.*** Illegal take of ESA listed fish can be detrimental to the overall abundance of a population(s), so officer presence is key to ensuring fishery compliance.
- ***Improve Enforcement of Existing Regulations.*** Rigorously enforce current regulations to protect salmonid habitat:
  - prioritize enforcement of habitat protection measures;
  - work to increase the accountability of government entities for the enforcement of state and local habitat protection laws;
  - establish public and private partnerships in enforcing laws needed to protect salmon habitat.

### Actions

- 1) Seek legislation to change the Hydraulic Permit Application program (HPA) to provide an expansion in civil authority, that includes infractions, fines, stop work and remediation orders to increase the effectiveness of the HPA compliance program.
- 2) Regional Fish Program staff will meet at least quarterly with their corresponding Enforcement Program Captain and Sergeants to discuss areas needing specific enforcement emphasis for the protection of the steelhead resource.
- 3) Fish and Wildlife officers will monitor compliance with priority HPAs.

- 4) Fish and Wildlife officers will conduct routine and emphasis patrols on fisheries that directly or indirectly impact ESA listed stocks.
- 5) WDFW will pursue increasing the penalty and fine associated with the illegal take of steelhead.
- 6) Develop and track performance measures associated with fishery and habitat compliance.
- 7) Develop and implement a “Stream Watch” program to increase the awareness of regulations and accountability of fishers.

# MONITORING, EVALUATION, AND ADAPTIVE MANAGEMENT

## Policy Statement

**Implement monitoring, evaluation and adaptive management to assess and improve the effectiveness of management and hatchery actions to protect the diversity and productivity of naturally produced stocks and the habitat they rely on.**

## Strategies

- ***Enhance Public Participation in Monitoring.*** Increase monitoring effectiveness through enhanced public participation in the collection of data.
- ***Evaluate Efficacy of Hatchery Programs to Support Harvest or Rebuild Depleted Natural Populations.*** Due to the natural variability associated with many of the indicators, e.g. run size, smolt-to-smolt survival, monitoring will be conducted annually but evaluation will be conducted over a five-year period.
- ***Establish Fishery/Escapement Data Management System.*** Monitor the effectiveness of management actions in achieving watershed based natural stock and hatchery escapement goals by maintaining a data system with age-specific estimates of the abundance, escapement, harvest, and fishery-related mortality of each stock.
- ***Expand Life History Studies to include the Marine Environment.*** Early marine survival as well as ocean distribution and survival are important for understanding and quantifying status and trend changes.
- ***Develop Comprehensive Steelhead Adult and Smolt Monitoring Program.*** Develop juvenile and adult abundance and productivity estimates for state critical- and federally-listed steelhead populations consistent with the Governor's Monitoring Forum.
- ***Link Recovery Plan Actions with Status and Trends of Steelhead Distinct Population Segments (DPSs).*** Actions and monitoring and evaluation programs identified in regional recovery plans directed at other species can also be beneficial for steelhead and identification of these links will be important.

## Actions

### Stock Structure, Diversity, and Abundance

- 1) Evaluate the stock structure of steelhead in the Puget Sound, Olympic Peninsula, and Southwest Washington regions. Evaluate assumptions of the 1992 comanager analysis and, building on the tools developed by the Puget Sound, Willamette/Lower Columbia, and Interior Columbia technical recovery teams, define and implement a consistent procedure for evaluating stock structure. In areas with significant uncertainty in stock structure, collect genetic samples for microsatellite or single nucleotide polymorphisms (SNP) analysis with methods that assure run timing and life history type are known.
- 2) Increase the percentage of natural stocks with escapement assessed on a regular basis through prioritization of monitoring, soliciting funding, developing alternative estimation

methods and sample designs, and enlisting the assistance of other organizations and the public. Expand adult snorkel survey methods developed in the lower Columbia River and Snake River tributaries to further quantify abundance estimates and impacts of marked hatchery fish spawning naturally with natural-origin steelhead.

- 3) Include British Columbia hatcheries within a broad scale monitoring and evaluation plan that assesses the productivity of natural stocks relative to the presence or absence of integrated or segregated hatchery programs.
- 4) Monitor and evaluate juvenile and adult abundance and productivity for state critical - and federally-listed steelhead.
- 5) Design and implement a program to monitor the genetic and life history characteristics of steelhead stocks and a management structure for analysis and reporting. Prioritize the collection of samples from control stocks and from watersheds with both a hatchery program and a significant natural stock.
- 6) Assess the actual gene flow rate between the non-local segregated hatchery stocks and naturally spawning stocks in conjunction with the stock assessment work.
- 7) Establish a web-accessible database with age-specific estimates of the abundance, escapement, harvest, and fishery related mortality of natural and hatchery steelhead stocks.

#### Stock Status

- 8) Reassess the status of all populations in Washington on a 4 to 8 year cycle to assure that opportunities for early action are not missed. Use population viability analysis (PVA) to filter spawner abundance data and, for populations identified to have a potential conservation concern, broaden the analysis to evaluate the contribution of rainbow trout to population viability, the previous performance of the population, and factors affecting population status.
- 9) Annually monitor and review the status of populations at risk, identify limiting factors, and assess the effectiveness of management actions. If necessary, implement new programs to address limiting factors, and potentially initiate “rescue programs” like kelt reconditioning, natural stream channel rearing, or hatchery supplementation to conserve natural populations until limiting factors are addressed.

#### Fishery Management

- 10) Produce an annual summary of smolts stocked by river for management and informational purposes.
- 11) Monitor recreational and tribal harvest and encounter rates through creel censuses, catch card cards, commercial fish buyer’s tickets, and tribal reporting.
- 12) Assess the accuracy of catch record card estimates of catch and estimate encounters of steelhead by initiating a rotating series of creel surveys and angler interviews.

#### Habitat Monitoring

- 13) Develop and implement a consistent method for using remote sensing data to monitor the status and trends of habitat.

### Hatchery Monitoring

- 14) Implement hatchery evaluation studies on selected facilities to compare replacement rate of natural stocks in the absence of hatchery programs with natural populations influenced by integrated or segregated hatchery programs.
- 15) Develop broodstock management plans for all steelhead programs and provide summary of hatchery replacement rate every five years.

### Manage for Success

- 16) Develop and implement a web-based system for monitoring the effectiveness of management actions and stock performance. Include SaSI stock status assessments and performance measures for harvest, hatchery, hydro, and habitat management.
- 17) Periodically evaluate genetic conservation guidelines to ensure steelhead genetic diversity is conserved.

## RESEARCH

### Policy Statement

**Implement steelhead research to inform management decisions on critical steelhead issues.**

### Strategies

- **Identify and Prioritize Research.** Annually convene key agency staff to review steelhead studies and prioritize research needs.
- **Actively Pursue Funding Opportunities.** Pursue funding for research from a variety of sources, including federal grants, contracts, and the Bonneville Power Administration.
- **Collaborate with External Agencies and Organizations.** Pursue enhanced collaboration with universities, the tribes, other agencies, and organizations.
- **Promote Interest in Steelhead Research.** Promote increased interest and funding of steelhead research by presenting study results to scientific and general audiences, developing a web page highlighting research findings, and publishing research findings in peer review publications.

### Actions

- 1) Assess the fishery related mortality caused by steelhead fisheries, including catch and release fisheries, through mark recapture or tagging studies.
- 2) Expand and support research that addresses uncertainties in the types of habitat used by steelhead.
- 3) Assess migration rates, pathways, and use of estuary, nearshore, and marine habitat by juvenile steelhead. Develop a longterm acoustic tagging study designed to increase understanding of early marine survival.
- 4) Establish a multi-agency, international study that would incorporate acoustic tagging and genetic baseline information to understand ocean migration patterns and genetic relationships.
- 5) Develop improved tools that relate environmental factors (e.g., climate, water temperature, stream flow) and the physiological status (e.g., length, growth rate) of juvenile *O. mykiss* to the diversity, spatial structure, abundance, and productivity of steelhead stocks.
- 6) Support and expand research to link changes in genetic markers to the abundance and productivity of the population.
- 7) Build on studies in the Cedar River, Yakima River, and other locations to develop a better understanding of the relationship of resident and anadromous *O. mykiss*. From these studies, develop improved tools to assess the potential effects of management actions and enhanced management strategies that effectively address resident and anadromous life history forms.

- 8) Determine the statistical requirements to provide reliable estimates of escapement and harvest contribution. Determine the number of coded-wire tags and other marks needed in relation to the number of recoveries expected.
- 9) Enhance Geographic Information System (GIS) capabilities by creating spatial data layers that identify barriers to fish passage, by incorporating additional variables into models that predict fish distribution, and by annually mapping the distribution of spawner redds.

## OUTREACH AND EDUCATION

### Policy Statement

**Implement outreach and education programs to ensure Washington's citizens value, support and have the information and opportunities necessary to participate in the restoration and protection of steelhead and their habitats.**

Involving and educating the public in steelhead restoration and natural resource issues is critical to successfully meeting its goal of healthy, self-sustaining steelhead stocks. When people understand the needs of steelhead they are able to make informed decisions about changes necessary to restore and maintain healthy watersheds and healthy natural stocks. A mobilized public that works in support of salmon restoration, contributes resources toward salmon restoration and changes current practices and behaviors to support restoration.

### Strategies

- ***Develop Comprehensive Approach to Reach Out to a Broad Base of Citizens.*** Develop short and longterm strategies for outreach messages and products which focus on user groups, service organizations, and environmental organizations and classroom-oriented education.
- ***Involve Citizens in all Phases of Restoring and Conserving Natural Steelhead Stocks.*** Work with partners to develop opportunities for citizens to help with data collection and monitoring and stream watch activities, improving understanding of fishery management techniques and habitat restoration and protection activities.
- ***Capitalize on Existing Programs.*** Work with existing programs to identify ways we can partner to increase protection and restoration of steelhead stocks: Steelhead/Cutthroat Policy Advisory Group, Regional Fishery Enhancement Groups, Lead Entities, Salmon Recovery groups, Salmon in the Classroom (830 schools), Wild About Washington (WDFW television program), Eyes in the Woods-Stream Watch.

### Actions

- 1) Develop an outreach and education plan – evaluate current programs and partnerships and develop ways to involve citizens in steelhead protection and restoration.
- 2) Develop messages, classes, events, and methods of delivery to communicate the importance of healthy steelhead stocks.
- 3) Continue outreach and education to improve understanding of fishery management techniques.
- 4) Develop information to assist salmon recovery implementers in creating complimentary activities to address steelhead conservation as well.

- 5) Develop brochures and materials that describe the important characteristics of steelhead habitat to assist habitat restoration groups.
- 6) Work with WDFW's Salmon in the Classroom Program, currently in more than 830 schools statewide, to provide messages to school children.
- 7) Work with the Eyes in the Woods to expand the Stream Watch program.
- 8) Develop and provide recreational anglers and others with information related to artificial production and harvest.

## DEFINITIONS

The following are definitions of terms as used in the WDFW Steelhead Management Plan. They are presented here to prevent confusion with how these or similar terms are used in other efforts.

- **Catch:** The act of landing a fish at which point the fisherman has the option of releasing or retaining it.
- **Catch-and-Release:** A non-retention hook-and-line fishery.
- **Condition Factor:** A numerical measure of the condition of a fish based on a length-weight relationship.
- **Critical Stock/Run:** A stock/run of fish experiencing production levels that are so low that permanent damage to the stock is likely or has already occurred.
- **Depressed Stock/Run:** A stock/run of fish whose production is below expected levels based on available habitat and natural variations in survival rates, but above the level where permanent damage to the stock is likely.
- **Escapement Goal:** That portion of a stock or group of stocks that is protected from harvest and allowed to spawn to meet management objectives and perpetuate the stock.
- **Genetic Conservation:** Protection of long-term sustainability of naturally produced stocks/runs by conserving genetic diversity.
- **Genetic Diversity:** Genetically determined differences among individual local breeding stocks as well as genetically determined differences between or among populations or stocks themselves.
- **Hatchery Fish:** Fish that have been incubated, hatched or reared in a hatchery or other artificial production facility regardless of parentage.
- **Healthy Stock:** A naturally produced stock that has sufficient abundance, productivity, diversity and spatial structure to be resilient through environmental fluctuations, to perform natural ecological functions in freshwater and marine systems, provide related cultural values to society, and sustain tribal and recreational fisheries.
- **Integrated Hatchery Strategy:** A broodstock management strategy where the intent is for returning adults of natural- and hatchery-origin to be reproductively connected to form a single, composite stock. This requires natural-origin adults in the hatchery broodstock, and hatchery-origin adults may spawn naturally.
- **Maximum Sustained Harvest Escapement Goal (MSH Escapement Goal):** The specific escapement for a stock that will allow the maximum number of fish to be harvested on a sustained basis.

- ***Non-Treaty:*** All fishers except those with reserved rights identified in the Stevens-Palmer treaties.
- ***Run:*** The sum of stocks of a single salmonid species which migrates to a particular region, river or stream of origin at a particular season.
- ***Segregated Hatchery Strategy:*** A broodstock management strategy where the intent is for the hatchery stock to be distinct with no reproductive interactions with natural stocks.
- ***Selective Fishery:*** A fishery with time, area, gear, or retention regulations designed to reduced impacts on non-target species or stocks.
- ***Mark Selective Fishery.*** A fishery requiring the release of fish lacking an adipose fin.
- ***Stock:*** The fish spawning in a particular lake or stream(s) at a particular season, which to a substantial degree do not interbreed with any group spawning in a different place, or in the same place at a different season.
- ***Natural Stock:*** Fish that are produced by spawning and rearing in the natural habitat, regardless of parentage.
- ***Wild Steelhead Release (WSR):*** A hook-and-line fishery that requires naturally produced steelhead (defined by not having fin clips) to be released. Hatchery steelhead (defined by having fin clips) may be retained.

## LITERATURE CITED

(Fill in later)

## Appendix 1. Agency Legislative Mandate and Strategic Plan

### Legislative Agency Mandate

*“The department shall conserve the wildlife and food fish, game fish, and shellfish resources in a manner that does not impair the resource. The department shall promote orderly fisheries and shall enhance and improve recreational and commercial fishing in this state.”*

### WDFW Strategic Plan

#### Mission Statement

The Washington Department of Fish and Wildlife serves Washington’s citizens by protecting, restoring and enhancing fish and wildlife and their habitats, while providing sustainable and wildlife-related recreational and commercial opportunities.

#### Vision Statement

Make Washington State a world-class outdoor destination by fostering an appreciation of abundant and sustainable fish and wildlife resources and their ongoing contributions to the Northwest quality of life.

**Goal I – Fish and Wildlife:** Achieve healthy, diverse and sustainable fish and wildlife populations and their supporting habitats.

**Goal II – Public Benefit:** Ensure sustainable fish and wildlife opportunities for social and economic benefit.

**Goal III – Funding:** Ensure effective use of current and future financial resources in order to meet the needs of the states fish and wildlife resource for the benefit of the public.

**Goal IV – Competence:** Implement processes that produce sound and professional decisions, cultivate public involvement and build public confidence and agency credibility.

**Goal V – Science:** Promote development and responsible use of sound, objective science to inform decision-making.

**Goal VI – Employee:** *This goal is currently under development and will be available when our completed Strategic Plan and Budget is submitted in late Summer 2006.*