

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

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

**Draft
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EXECUTIVE SUMMARY

[To be completed upon finalization of the plan]

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INTRODUCTION

Steelhead, the Washington State fish, 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. Four of the seven Distinct Population Segments (DPSs) within the State of Washington are listed under the federal Endangered Species Act (ESA), with a component of a fifth, the Puget Sound Distinct Population Segment, proposed for federal listing. The varied status of wild steelhead stocks statewide, in conjunction with the increased expectations for resource managers to balance public interests towards conservation, tribal and non-tribal fisheries, economic stability as well as other social-cultural and environmental values, motivated the development of a statewide steelhead plan.

To restore and preserve this important resource, the Washington Department of Fish and Wildlife (the Department) initiated a multi-step process to improve the management and status of steelhead in Washington. The first 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 stocks and their status in Washington was published in the report "*Oncorhynchus mykiss: Assessment of Washington State's Anadromous Populations and Programs*". Review of this report is crucial to understanding the subsequent foundation laid in this document for future management of steelhead in the state. Each chapter in the Science Paper concluded with numerous findings and recommendations to guide future management.

Building on the science foundation, this second step (referred to as Volume 1) provides a framework of policies, strategies, and actions for application throughout the state in steelhead management. Recognizing that substantial variation exists in the status of stocks, habitat conditions, and that tribal, local, and federal authorities vary across the state the objective for this document is to guide the Department in the development of the third and final step; Volumes 2-8. For many of these regions, recovery plans have been developed and will compliment Volume 1 to serve as primary guidance for detailed strategies and actions identified within the regional management plans. These volumes will be developed simultaneously during the next 24 to 36 months.

- Volume 2. Puget Sound
- Volume 3. Olympic Peninsula
- Volume 4. Southwest Washington
- Volume 5. Lower Columbia River
- Volume 6. Mid-Columbia River
- Volume 7. Upper Columbia River
- Volume 8. Snake River

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 of the regional volumes, with the respective tribes.

GOAL AND POLICIES

The purpose of this document is to provide a framework of policies, strategies, and actions that will lead to achievement of the following goal for the steelhead stocks and fisheries of Washington:

Restore and maintain the abundance, distribution, diversity and long-term productivity of Washington's wild 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:*** Place the highest priority of steelhead management on the protection of wild steelhead stocks and restoration of these stocks to healthy levels.
- ***Habitat Protection and Restoration:*** Seek to protect and restore the quality, quantity, and productivity of freshwater and marine habitat necessary to sustain and restore healthy steelhead stocks.
- ***Fishery Management:*** Fisheries shall be managed to promote achievement of region-wide conservation and recovery goals through the protection and restoration of the diversity, spatial structure, abundance, and productivity of wild steelhead stocks. The Department shall implement a cooperative management approach for fishery resources subject to both state and tribal management, with the state and tribes exercising their respective authorities. Within the constraints of the natural production policy and tribal harvest-sharing obligations, the Department shall strive to provide diverse¹ recreational fishing opportunities.
- ***Artificial Production:*** Promote the achievement of the natural production policy and provide fishery-related benefits by implementing artificial production programs with the following characteristics :
 - ***Conservation Programs.*** Artificial programs implemented with a conservation objective shall have a net benefit to the diversity, spatial structure, productivity, and abundance of the target wild stock.
 - ***Harvest Programs.*** Artificial production programs implemented to enhance harvest opportunities shall provide cost-effective fishery benefits while allowing watershed-specific goals for the diversity², spatial structure, productivity, and abundance of wild stocks to be met.

¹ Diverse includes access (bank, boat, marine and freshwater), gear, retention and non-retention.

² Diversity is variation among individuals in physical, genetic, or life history characteristics.

- **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 to protect the abundance, diversity and productivity of wild stocks and the habitat they rely on. Measurable thresholds will be included within the monitoring and evaluation component of each regional plan to inform decisions and facilitate transparent accounting of progress in implementing the statewide policies, strategies, and actions.
- **Research:** Support and implement steelhead research to assure that sound science informs management decisions on critical steelhead issues.
- **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 shall place the highest priority on the protection of wild steelhead stocks and restoration of these stocks to healthy levels.

Strategies

- 1) ***Protect and Restore the Diversity of Wild Stocks.*** Evaluate and modify management actions to promote local adaptation, increase and maintain the diversity within and among stocks, and sustain and maximize the long-term productivity of wild stocks.
- 2) ***Provide Sufficient Wild Spawners.*** Provide sufficient diversity and numbers of wild spawning steelhead to promote levels of diversity, spatial structure, productivity, and abundance consistent with a healthy stock.

A healthy wild 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.

Selection of an effective strategy for implementing the natural production policy and identifying escapement objectives depends on the certainty of our understanding of stock population dynamics, the condition of the habitat, and the status of the stock. An escapement objective greater than the number of spawners associated with the Maximum Sustained Harvest (MSH) may be necessary to sustain populations over the long term, achieve diversity and spatial structure objectives, address uncertainties in management, or to test assumptions about stock productivity and habitat. Escapement strategies will be based on the following guidelines:

- a. SaSI Status is Unknown. Apply a precautionary strategy by implementing low-risk fishery and hatchery management regimes.
 - b. SaSI Status is Depressed or Critical, or ESA-Listed. Promote a trend of increasing numbers of wild spawning steelhead by implementing an escapement strategy with a series of interim, increasing escapement objectives.
 - c. SaSI Status Healthy. Implement a strategy that promotes maintenance of healthy stocks, with an escapement objective at least, if not more than, the number of wild spawners associated with the MSH.
- 3) ***Manage from Ecosystem Perspective.*** Protect and restore salmonid stocks and other indigenous aquatic species to levels that sustain healthy ecosystem processes, including food web links to wild stocks of steelhead.

- 4) ***Describe Path with Measurable Benchmarks to Long-term Goals.*** Identify the long-term goal and the factors limiting the health of each stock. Describe a path to the long-term goal with measurable benchmarks for modifications to fishery, hatchery, and habitat management and the expected performance of each stock.

Actions

- 1) Prevent the loss of wild steelhead stocks through diligent monitoring of at-risk stocks and implementation of improved harvest, hatchery, and habitat management strategies.
 - a. Provide a report on at-risk stocks of wild steelhead to the Director and Fish & Wildlife Commission at the time this policy is approved and subsequently at 5-year intervals. Include in the report a summary of limiting factors and recommended management actions.
 - b. Annually monitor and review the status of wild steelhead stocks at risk, identify limiting factors, and assess the effectiveness of management actions. Recommend and implement new actions to address limiting factors and, if warranted, initiate “rescue programs” like kelt reconditioning, natural stream channel rearing, or hatchery supplementation to conserve wild stocks until limiting factors are resolved.
 - c. Develop a hatchery conservation reference document that discusses the conditions under which a hatchery conservation program may be warranted to maintain or restore at-risk wild stocks and the key questions that should be addressed in an implementation plan.
- 2) Develop and implement regional management plans that identify the long-term goal, benchmarks for modifications to management actions, escapement objectives, and the expected trajectory for the diversity, spatial structure, productivity, and abundance of each wild stock. Complete this action within two years of the adoption of this policy for stocks that are listed under the Endangered Species Act or have a SaSI status of Critical. Complete this action for the remainder of stocks within five years of the adoption of this policy.
- 3) Implement consistent procedures with watershed planning groups to review changes in habitat resulting from restoration projects or other factors and adjust escapement objectives.
- 4) Support programs that restore balanced ecological functions and reduce predation impacts to critical steelhead. Opportunistic predation by marine mammals and birds due to manmade structures, can lead to elevated mortality rates that can impact the short and long term health of wild anadromous fish runs:
 - a. Identify structures, which allow high rates of unnatural predatory opportunity to occur.
 - b. Address nuisance seal and sea lion predation by pursuing authorization from the National Marine Fisheries Service to use hazing and/or lethal means to protect endangered and threatened salmon and steelhead when necessary.

- c. Identify bird species that take an unusually large number of juveniles or out migrating smolts. Identify whether these bird species numbers have risen in response to hatchery releases of salmonids.
- d. Identify the predator attraction impact on wild steelhead (salmonids) juveniles and smolts due to hatchery steelhead smolt releases.

HABITAT PROTECTION AND RESTORATION

Policy Statement

Protect and restore the quality, quantity, and productivity of freshwater and marine habitat necessary to sustain and restore healthy steelhead stocks.

Habitat here is used in its broadest sense that includes the functions provided by freshwater, estuarine, and marine environments, water quality and quantity, marine-derived nutrients and forage fish. Access to suitable and sufficient habitat is a critical requirement for maintaining healthy wild steelhead stocks.

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

Strategies

- 1) ***Encourage Local Problem Solving.*** Encourage local problem solving with participation by local citizens, concerned groups, the tribes, and state, local, and federal agencies in the development and implementation of improved strategies for habitat protection and restoration.
- 2) ***Provide Technical Expertise.*** Ensure that technical expertise is available to local planning and fish recovery 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.
- 3) ***Facilitate Access to Information.*** Promote effective steelhead protection and restoration 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.
- 4) ***Promote Comprehensive Ecosystem Based Approach and an All-H Strategy.*** Work with local and regional habitat managers and fish recovery groups at the watershed level to assess, protect, and restore habitat using a comprehensive, ecosystem based approach that recognizes the continuum that extends throughout the watershed, its estuary, and near shore marine waters. Develop and implement comprehensive hatchery, habitat, hydro, and harvest management plans that link all strategies within an “All-H” context.
- 5) ***Enhance Effectiveness of WDFW’s Hydraulic Project Approval (HPA).*** Continue to streamline HPA’s for habitat restoration projects.

- 6) ***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:
 - a. Avoiding the impact altogether by not taking a certain action or parts of an action.
 - b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
 - c. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
 - d. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
 - e. Compensating for the impact by replacing or providing substitute resources or environments.
 - f. Monitoring the impact and taking appropriate corrective measures to achieve the identified goal.

- 7) ***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 and limiting factors can assist in developing and prioritizing habitat restoration projects that will benefit steelhead.

- 8) ***Promote Funding of Habitat Protection and Restoration.*** With local governments, Salmon Recovery Funding Board, Governor's office, Congressional representatives, and state legislators, secure federal, state, and local funding to continue protection and restoration of habitat.

- 9) ***Implement Nutrient Enhancement where it Will Enhance Population Productivity.*** Promote nutrient enhancement in streams that display nutrient deficiency.

- 10) ***Develop a Climate Change Response Plan.*** Develop a plan that describes the projected impacts of climate change on steelhead habitat, provides hypotheses on effects on steelhead populations, and identifies actions to promote perpetuation of 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 based on Subbasin plans, Limiting Factors Analysis Reports, and regional recovery planning or other watershed planning efforts.

- 2) Assure lead entities and RFEG's have sufficient information to identify and prioritize projects that provide a benefit to steelhead.

- 3) Use the Federal Energy Regulatory Commission (FERC) as a vehicle to negotiate with power project owners to improve habitat for steelhead.

- 4) Negotiate with action agencies to improve upstream and downstream survival of steelhead, including kelts, through hydro facilities.
 - a. 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: 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) Promote coordination between state and local agencies as well as interested organizations to develop innovative approaches in securing materials from timber blow down, road clearing, and other site preparation for use in stream restoration projects.

FISHERY MANAGEMENT

Policy Statement

Fisheries shall be managed to promote achievement of region-wide conservation and recovery goals through the protection and restoration of the diversity, spatial structure, abundance, and productivity of wild steelhead stocks. The Department shall implement a cooperative management approach for fishery resources subject to both state and tribal management, with the state and tribes exercising their respective authorities. Within the constraints of the natural production policy and tribal harvest-sharing obligations, the Department shall strive to provide diverse recreational fishing opportunities.

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 the Department, the affected Indian tribes, other states, and the National Oceanographic and Atmospheric Administration (NOAA).

The Department recognizes that there are inherent differences and values between hatchery steelhead and wild fish to recreational fishers. They have different run timing, management objectives, escapement requirements, and economic and cultural values. The Department will address these differences and fisheries benefits when designing annual fishery management plans to meet management objectives. In general, nontreaty fishers should have an opportunity to utilize a portion of both the hatchery and wild fish that are available for harvest unless otherwise agreed by the Department and the affected Indian tribes.

Strategies

- 1) ***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.
- 2) ***Promote Selective Harvest.*** Reduce impacts to non-target stocks and species.
 - a. **Steelhead Fisheries.** Promote the use of fishing methods and regulations that focus harvest on hatchery-origin steelhead and provide for the conservation of wild steelhead.
 - b. **Other Fisheries.** Develop and promote the implementation of fishing methods and regulations that maximize the harvest of the target species while maintaining impacts to nontarget species within allowable limits.
- 3) ***Develop Comprehensive All-H Strategy.*** Develop and implement comprehensive hatchery, habitat, hydro, and harvest management plans that link fishery management strategies within an “All-H” context.

- 4) ***Account for all Sources of Fishery Related Mortality.*** Incorporate all sources of fishing related mortality in fishery management.
- 5) ***Describe Path with Measurable Benchmarks to Long-term Goals.*** Evaluate the current benefits and risks of the current fishery management regime relative to the long-term goals for each stock. Describe a path to the long-term goal with measurable benchmarks for modifications to fishery, hatchery, and habitat management and the expected performance of each stock. For fishery management affecting wild stocks important for recovery and conservation, escapement objectives will be established based on the following guidelines:
 - a. SaSI Status is Unknown. Apply a precautionary strategy by implementing low-risk fishery and hatchery management regimes.
 - b. SaSI Status is Depressed or Critical, or ESA-Listed. Promote a trend of increasing numbers of wild spawning steelhead by implementing an escapement strategy with a series of interim, increasing escapement objectives.
 - c. SaSI Status Healthy. Implement a strategy that promotes maintenance of healthy stocks, with an escapement objective at least, if not more than, the number of wild spawners associated with the MSH.
- 6) ***Provide Diverse Fishing Opportunities.*** Assure that the diverse interests of the recreational fishing community are addressed, including catch and release, retention, accommodations for disabled anglers, access, and multiple gear type opportunities.
- 7) ***Adaptively Manage Fisheries.*** Adaptively manage fisheries to assure that fishery plans are responsive to variable productivity, region-wide conservation and recovery goals are achieved, and fishing-related economic and cultural benefits are maximized.

Actions

- 1) In fisheries where steelhead are captured incidentally to the harvest of other species, implement regulations/selective fishing techniques that protect the wild stocks.
 - a. Protect juvenile steelhead and resident rainbow trout by closing fisheries during the spring smolt migration period and through the use of minimum fish size, gear restrictions and bag limits during periods when the fisheries are open.
 - b. Develop methods for improving the selective harvest of salmonids in commercial fisheries.
- 2) Compute the total fishery related mortality in fisheries impacting steelhead. As a precautionary measure, assume and apply an overall mortality rate of 10% for steelhead landed and released in recreational fisheries. The 10% mortality factor incorporates immediate mortality of fish landed and released, delayed mortality, potential mortality of fish that are hooked but not landed, potential reductions in reproductive success, potential effects of multiple encounters, and uncertainty in the number of encounters. For commercial fisheries, use a site specific mortality rate.
- 3) Recreational Fishery Management Guidelines – Abundance and Escapement Known. Where abundance and escapement are known, guidelines for managing recreational

steelhead fisheries are described in tables 1 (ESA-listed and SaSI status Critical stocks) and 2 (not ESA-listed and not SaSI status Critical). Wild steelhead release (WSR), selective gear rules, closed seasons or closed areas will be implemented as appropriate to regulate the recreational fishery.

- 4) Recreational Fishery Management Guidelines – Abundance or Escapement Not Known. Manage the recreational fishery with the following precautionary measures where the abundance or escapement of a wild stock is not known.
 - a. Streams with Wild Steelhead but No Hatchery-Origin Steelhead. No recreational fishing for steelhead will be authorized.
 - b. Streams with Wild Steelhead and Hatchery-Origin Steelhead. A recreational fishery with wild steelhead release may occur. If a difference exists between the run timing of the hatchery and wild steelhead, no recreational fishing for steelhead will be authorized after the end of the hatchery management period.

- 5) 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 production, and harvest sharing objectives for state and tribal fisheries.

Table 1. Guidelines for managing recreational steelhead fisheries with known abundance, stock in ESA-listed ESU, or one or more of stocks in management unit have a SaSI stock status of Critical.

Abundance of Wild Management Unit (MU)	Abundance of Hatchery Management Unit (MU)	
	<u>Less than</u> the Hatchery MU escapement objective	<u>Greater than</u> the Hatchery MU escapement objective
<u>Abundance Less than</u> Wild MU escapement objective	<ul style="list-style-type: none"> • Close all recreational steelhead fisheries. 	<ul style="list-style-type: none"> • No fisheries directed at steelhead if the abundance of wild steelhead is less than the critical threshold. • Minimize mortality to wild stock(s) and in no case exceed a 10% impact from all fisheries <i>or</i> the ESA fishery permit limit.
<u>Abundance Greater than</u> Wild MU escapement objective	<ul style="list-style-type: none"> • Assure wild MU escapement objective is achieved. • Minimize mortality impacts on hatchery fish to provide sufficient broodstock. 	<ul style="list-style-type: none"> • Assure wild and hatchery MU escapement objectives are achieved. • Provide recreational fishery opportunities for both hatchery and wild fish.

Table 2. Guidelines for managing recreational steelhead fisheries with known abundance, stock not in ESA-listed ESU, and SaSI stock status not Critical.

Abundance of Wild Management Unit (MU)	Abundance of Hatchery Management Unit (MU)	
	<u>Less than</u> the Hatchery MU escapement objective	<u>Greater than</u> the Hatchery MU escapement objective
<u>Abundance Less than</u> Wild MU escapement objective	<ul style="list-style-type: none"> • Close all recreational steelhead fisheries. 	<ul style="list-style-type: none"> • Minimize mortality to wild stock(s) and in no case exceed a 10% impact from all fisheries.
<u>Abundance Greater than</u> Wild MU escapement objective	<ul style="list-style-type: none"> • Assure wild MU escapement objective is achieved. • Minimize mortality impacts on hatchery fish to provide sufficient broodstock. 	<ul style="list-style-type: none"> • Assure wild and hatchery MU escapement objectives are achieved. • Provide recreational fishery opportunities for both hatchery and wild fish.

- 6) Develop and implement regional management plans that identify the long-term goal, benchmarks for modifications to management actions, escapement objectives, and the expected trajectory for the diversity, spatial structure, productivity, and abundance of each wild stock. Complete this action within two years of the adoption of this policy for stocks that are listed under the Endangered Species Act or have a SaSI status of Critical. Complete this action for the remainder of stocks within five years of the adoption of this policy.

The regional plans will include the following elements.

- a. Fishery Assessment. Assess the current benefits and risks of each fishery relative to the potential effects on the diversity and spatial structure, and abundance and productivity of wild stocks. Several key risk factors to consider are discussed below.
 - *Diversity and Spatial Structure.* Evaluate the potential selective effects on wild stocks of fisheries that target hatchery stocks, particularly those with a different run timing or spatial distribution. Modify the timing of fisheries, gear types, or fishery characteristics to enhance diversity and spatial structure consistent with watershed goals.
 - *Abundance and Productivity.* Evaluate the effects of harvest rates established for management units on the abundance and productivity of the constituent stocks. Reduce fishing harvest rates if the projected abundance of a stock is

inconsistent with the wild production goal. Assure that harvest rates on wild stocks during periods targeting hatchery fish are responsive to changes in productivity and are consistent with the path to achieving benchmarks and long-term goals.

- b. **Fishery Management.** Describe the harvest rate, escapement goal or other management strategy that will be used, the expected short and long-term effects of the fishery, measurable benchmarks on the diversity, spatial structure, productivity, and abundance of the wild stock, and other necessary metrics to determine whether the fishery management program is meeting its objectives.
 - c. **Monitoring, Evaluation, and Adaptive Management.** Document the monitoring and evaluation plan for each fishery and the process for making revisions (adaptive management) to the program.
- 7) Provide recreational fishers with two general types of fishing opportunities on adult steelhead:
- 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 wild fish but they must be consistent with wild fish protection guidelines.
 - c. “Selective Gear Rules”, as described in the fishing pamphlet, will apply to catch and release fisheries that target wild steelhead in excess of the escapement objectives.
- 8) Distribute recreational opportunities among retention and catch-and-release fisheries based upon testimony received at Fish & Wildlife Commission meetings, letters to the Department, 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 years³.
- 9) Evaluate and report results from the fishery management monitoring and evaluation plan on an annual basis with an initial summary in five years and every five years thereafter.
- 10) Develop (web based access) central repository for reporting total harvest of steelhead through direct and indirect fisheries.

³ 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

Promote the achievement of the natural production policy and provide fishery-related benefits by implementing artificial production programs with the following characteristics:

Conservation Programs. Artificial programs implemented with a conservation objective shall have a net aggregate benefit for the diversity, spatial structure, productivity, and abundance of the target wild stock.

Harvest Programs. Artificial production programs implemented to enhance harvest opportunities shall provide cost-effective fishery benefits while allowing watershed-specific goals for the diversity¹, spatial structure, productivity, and abundance of wild stocks to be met.

Strategies

- 1) ***Establish Network of Wild Stock Gene Banks.*** Establish a network of wild stock gene banks across the state where wild stocks are largely protected from the effects of hatchery programs. One wild stock gene bank will be established for each major population group in each ESU. Each gene bank established will have the following characteristics and management:
 - a. Each stock selected for inclusion in the gene bank must be sufficiently abundant and productive to be self-sustaining in the future.
 - b. No releases of hatchery-origin steelhead will occur in streams where spawning of the stock occurs, or in streams used exclusively by that stock for rearing.
- 2) ***Mark all Artificial Production.*** Mark or tag all fish released from artificial production programs to evaluate program risks and benefits and facilitate selective fisheries.
- 3) ***Develop Comprehensive All-H Strategy.*** Develop and implement comprehensive hatchery, habitat, hydro, and harvest management plans that ensure the artificial production program compliments the strategies for other Hs (i.e., "All-H" context).
- 4) ***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.
- 5) ***Describe Path with Measurable Benchmarks to Long-term Goals.*** Evaluate the current benefits and risks of the current relative to the long-term goals for each stock. Describe a path to the long-term goals with measurable benchmarks for modifications to fishery, hatchery, and habitat management and the expected performance of each stock. For

programs affecting the wild stocks of importance for conservation and recovery, the long-term goal will include the following elements:

- a. Integrated programs implemented to enhance harvest opportunities (i.e., integrated harvest program) will achieve a proportionate of natural influence (PNI) equal to or greater than 0.70 on average, use hatchery practices that reduce the risks of domestication, and use broodstock that is indigenous to the watershed.
 - b. Segregated programs implemented to enhance harvest opportunities (i.e., segregated harvest program) will result in an average gene flow of less than 2% from the hatchery to the wild stock, use broodstock that originated from releases of juveniles in that watershed, and result in minimal ecological effects.
- 6) ***Implement Rescue Programs for At-Risk Stocks.*** Maintain at-risk wild stocks until limiting factors are addressed by implementing programs such as kelt reconditioning and hatchery conservation programs
- 7) ***Adaptively Manage Programs.*** Adaptively manage artificial production programs to assure that current programs are responsive to variable productivity, region-wide conservation and recovery goals are achieved, and fishing-related economic and cultural benefits are maximized.

Actions

- 1) Protect wild steelhead stocks from potential interactions with hatchery-origin rainbow trout.
 - a. Do not release hatchery-origin rainbow trout in rivers and streams.
 - b. Do not release hatchery-origin rainbow trout in lakes if the release would result in a significant negative impact to wild steelhead.
- 2) Ensure compliance of WDFW facilities with environmental regulations (e.g. water quality, fish passage, and screening). Identify facilities currently not in compliance and develop a capital budget plan to bring facilities into compliance.
- 3) Protect wild steelhead stocks from the importation, dissemination, and amplification of pathogens by adhering to the “Salmonid Disease Control Policy of the Fisheries Co-managers of Washington State”.
- 4) 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.
- 5) Assess the current risks and benefits, including economic 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.
- 6) Segregated Programs. Two key risks associated with segregated programs are a potential loss of diversity (within and between stocks) and competition.

- a. Manage the collection of broodstock for Chambers Winter and Skamania Summer programs to maintain or increase the difference in spawn timing with wild steelhead stocks by establishing a spawn timing cutoff date for each hatchery program.
 - b. Evaluate the potential range of gene flow from returning adults of hatchery-origin to wild-origin stocks in all watersheds where Chambers Winter or Skamania Summer steelhead stocks are released, or where a segregated program has been in place for three or more generations.
 - c. Evaluate the potential effects of competition of hatchery-origin juveniles, adults, and the progeny of naturally spawning hatchery adults with wild-origin stocks. Place a priority evaluation for all wild stocks that are listed under the ESA, or have a SaSI status of Critical or Depressed.
 - d. 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 timing of broodstock collection and spawning, program size, release location, harvest rate in all fisheries, rearing practices affecting the rate of residualism 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.
- 7) Integrated Programs. Three key risk factors associated with integrated programs are a loss of diversity, domestication, and a reduction in the number of wild 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 wild stock has been extirpated, a stock with morphological, life history, and genetic characteristics similar to the extirpated stock.
 - b. Collect broodstock from the wild stock that is representative of their abundance, diversity, distribution, and run timing.
 - c. Evaluate the PNI, potential range of changes in productivity of wild spawners, and demographic risks and benefits. Where risks are shown to be inconsistent with watershed goals, modify the size, fish culture practices, release strategy, or other characteristics of the program, reduce fishery harvest rates on wild-origin steelhead and increase fishery harvest rates on hatchery-origin steelhead, and/or enhance the productivity of the natural habitat.
- 8) Develop and implement regional management plans that identify the long-term goal, benchmarks for modifications to management actions, escapement objectives, and the expected trajectory for the diversity, spatial structure, productivity, and abundance of each wild stock. Complete this action within two years of the adoption of this policy for stocks that are not listed under the Endangered Species Act or have a SaSI status of Critical. Complete this action for the remainder of stocks within five years of the adoption of this policy.

The regional plans will include the following elements.

- a. Artificial Production Program Assessment. Assess the current benefits and risks of each program relative to the potential effects on the diversity, spatial structure, abundance, and productivity of wild stocks.
 - b. Describe each artificial production program with an operational plan that documents the program objectives, performance objectives and indicators, specific operational components, and risk control measures, and benchmarks for the program modifications necessary to achieve the long-term goal.
 - c. Monitoring, Evaluation, and Adaptive Management. Document the monitoring and evaluation plan for each artificial production program and the process for making revisions (adaptive management) to the program.
- 9) Evaluate and report results from the artificial production monitoring and evaluation plan on an annual basis with an initial summary in five years and every five years thereafter.

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

- 1) ***Improve Enforcement of Existing Habitat Regulations.*** Rigorously enforce current regulations to protect salmonid habitat:
 - a. Prioritize enforcement of habitat protection measures;
 - b. Work to increase the accountability of government entities for the enforcement of state and local habitat protection laws;
 - c. Establish partnerships in enforcing laws needed to protect salmon habitat.
- 2) ***Increase Enforcement Presence in Fishery Areas with ESA Listed Fish as well as populations of special concern.*** Ensure fishery compliance through increased officer focus on areas containing ESA-listed fish or species of concern.
- 3) ***Increase Penalties Associated with Noncompliance.*** Increase the consequences associated with noncompliance by requesting increased penalties for illegal actions through legislative process.
- 4) ***Implement Improved Compliance Strategies.*** Improve compliance with existing regulations through the development, testing, and implementation of innovative techniques.
- 5) ***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.

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 HPA compliance.

- 2) Regional Fish Program staff will meet at least quarterly with 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 seek legislation that increases the penalties and fines associated with the illegal take of unmarked steelhead.
- 6) Develop and track performance measures associated with fishery and habitat compliance.
- 7) Develop and implement a statewide “Stream Watch” program that puts volunteer observers on rivers to increase the awareness of regulations and accountability of fishers.
- 8) Develop and implement innovative techniques to improve compliance such as wild fish tags, outreach programs, signage, and law enforcement emphasis patrols.
- 9) Conduct pilot review of performance and outcome of the HPA Program.

MONITORING, EVALUATION, AND ADAPTIVE MANAGEMENT

Policy Statement

Implement monitoring, evaluation and adaptive management to assess and improve the effectiveness of management to protect the abundance, diversity and productivity of wild stocks and the habitat they rely on.

Strategies

- 1) ***Actively Pursue Funding Opportunities.*** Pursue funding for monitoring, evaluation, and adaptive management from a variety of sources, such as state funding, federal grants, contracts, non-governmental organizations and the Bonneville Power Administration.
- 2) ***Establish Fishery/Escapement Data Management System.*** Monitor the effectiveness of management actions in achieving watershed based wild stock and hatchery escapement goals by establishing and maintaining an accurate data system with age-specific estimates of abundance, escapement, harvest, fishery, other related mortality, etc. of each SaSI stock.
- 3) ***Establish an adaptive management system (feedback loop) to evaluate and implement appropriate actions to support progress towards achieving the identified goals within the Plan's chapters.***
 - a. Regional adaptive management systems will be developed in concert with regional recovery plans;
 - b. Or, developed in those regions without a recovery plan.
- 4) ***Develop Comprehensive Steelhead Adult and Smolt Monitoring Program.*** Develop juvenile and adult abundance and productivity estimates for all steelhead populations consistent with the Governor's Monitoring Forum, regional salmon recovery plans, sub-basin plans, watershed and other local or regional plans.
- 5) ***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.
- 6) ***Ensure the Department's habitat staff are involved in and part of the development of monitoring and evaluation plans associated with habitat enhancement.*** Work with habitat staff to address steelhead habitat enhancement needs.
- 7) ***Enhance Public Participation in Monitoring.*** Increase monitoring effectiveness through enhanced public participation in the collection of data where appropriate.

- 8) *Expand Life History Studies to include those things we don't know.* Early marine survival as well as ocean distribution and survival are important for understanding and quantifying status and trend changes.

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 co-manager 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. Collect samples for analysis with methods that assure run timing and life history type are known.
- 2) Increase the percentage of wild 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.
- 3) Periodically evaluate genetic conservation guidelines to ensure steelhead genetic diversity is conserved.
- 4) Include British Columbia, Oregon and Idaho hatcheries within a broad scale monitoring and evaluation plan that assesses the productivity of wild stocks relative to the presence or absence of integrated or segregated hatchery programs.
- 5) Monitor and evaluate juvenile and adult abundance and productivity for all stocks with a priority towards SaSI critical - and federally-listed steelhead.
- 6) 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 wild stock.
- 7) Assess the gene flow rate between the non-local segregated hatchery stocks and wild stocks in conjunction with the stock assessment work.
- 8) Establish a web-accessible database with age-specific estimates of the abundance, escapement, harvest, fishery and other related mortality of wild and hatchery steelhead stocks.
- 9) Seek funding to support the additional monitoring and evaluation components that will address unknown mortality factors.

Stock Status

- 10) 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 evaluate spawner abundance 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.

- 11) Annually monitor and review the status of populations at risk, identify limiting factors, and assess the effectiveness of management actions. Recommend new programs to address limiting factors, and potentially initiate “rescue programs” like kelt reconditioning, natural stream channel rearing, or hatchery supplementation to conserve wild populations until limiting factors are resolved.

Fishery Management

- 12) Produce an annual report of smolts stocked by river for management and informational purposes (web-accessible).
- 13) Produce an annual recreational and tribal harvest report.
- 14) Monitor recreational, commercial and tribal harvest and encounter rates through creel censuses, catch record cards, commercial fish buyer’s tickets, onboard observers, and tribal reporting.
- 15) Improve the precision for direct and indirect harvest related mortalities.

Habitat Monitoring

- 16) Develop and implement a consistent method for using remote sensing data to monitor the status and trends of steelhead habitat.
- 17) 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.
- 18) Assess long-term planning acts (GMA, SMA, SRA) to determine whether they maintain or increase the amount of mature riparian forest as designed.
- 19) Delineate or model the past, current, and likely future distributions of steelhead populations to facilitate the identification of conservation and restoration priorities as expected changes to habitat occur through climate change and management influences.
- 20) Develop tools that allow us to better predict the effects of water management (quantity and quality) practices under different climate, weather, and management scenarios.

Artificial Production

- 21) Implement hatchery evaluation studies on selected facilities to compare replacement rate (recruits per spawner) of wild steelhead in the absence of artificial production with wild populations influenced by artificial production.
- 22) Implement hatchery monitoring and evaluation program(s) to determine if artificial production strategy (integrated or segregated) are achieving the identified program goals for percent natural influence and stray rate.
- 23) Develop broodstock management plans for all steelhead programs and provide summary of hatchery replacement rate every five years.
- 24) Seek funding to bring hatchery facilities into compliance with federal and state standards.

Verification and Accountability

- 25) Develop and implement a web-based reporting system for monitoring and evaluating the effectiveness of policy, actions and stock performance. Include SaSI stock status assessments, priority actions and performance measures for harvest, hatchery, hydro, and habitat management.

- a. Annually collect, record and update the web-based reporting system.
 - b. Every five years a report will be compiled and provided to the Director and Fish and Wildlife Commission articulating results and progress towards wild production goals, including agency compliance with statewide policies and guidelines.
- 26) Upon completion of the statewide management plan, WDFW will conduct an assessment to evaluate all current programs in order to develop a baseline to determine which programs are in compliance and which programs are not in compliance. For those programs not currently in compliance with the statewide management plan, WDFW will then develop objectives toward reaching our goal.

RESEARCH

Policy Statement

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

Strategies

- 1) ***Identify and Prioritize Research.*** Annually convene key agency staff and stakeholders to review steelhead studies and prioritize research needs throughout the state.
- 2) ***Actively Pursue Funding Opportunities.*** Pursue funding for research from a variety of sources, such as state funding, federal grants, contracts, non-governmental organizations and the Bonneville Power Administration.
- 3) ***Collaborate with External Agencies and Organizations.*** Pursue enhanced collaboration with universities, the tribes, other agencies, and organizations.
- 4) ***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 to define the relationship between steelhead productivity and habitat, both freshwater and marine.
- 3) Assess migration pathways, rates and use of estuary, nearshore, and marine habitat by juvenile steelhead. Develop a long-term 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.
- 5) Develop improved tools that relate environmental factors (e.g., climate, water temperature, stream flow) and the physiological status (e.g., length, growth rate, life history pathways) 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 populations (e.g. quantitative traits).
- 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. Determine the number of coded-wire tags and other marks needed in relation to the number of recoveries expected in all geographical areas and at large and small scales.
- 9) Conduct study to determine effects of integrated artificial programs on diversity and productivity of wild stocks.
- 10) Establish a series of representative reference streams and steelhead populations (coordinating with recovery actions identified by the Technical Review Teams (TRTs)) against which recovery actions taken in other systems and habitat and the population's responses can be measured.

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 habitat.

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

Strategies

- 1) ***Develop Comprehensive Approach to Reach Out to a Broad Base of Citizens.*** Work with public and private partners such as: PUDs, counties, RFEES, to develop short and long-term strategies for outreach messages and products which focus on user groups, service organizations, landowners and environmental organizations and classroom-oriented education. Messages should address the economic, cultural and ecological values of steelhead to Washington.
- 2) ***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.
- 3) ***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 Fisheries 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, and WSU Cooperative Extension.

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 a media plan to share the steelhead plan, and to develop methods to communicate important steelhead messages.

- 3) Develop messages, classes, events, and methods of delivery to communicate the importance of healthy steelhead stocks.
- 4) Create a speakers bureau (not just brochures/fliers/information) to provide information on steelhead local user groups. Chapters of TU, Puget Sound Anglers, Cowlitz Game and Anglers, Vancouver Wildlife League, etc.
- 5) Continue outreach and education to improve understanding of fishery management techniques.
- 6) Develop information to assist salmon recovery efforts to create complementary activities to address steelhead conservation as well as salmon conservation.
- 7) Develop brochures and materials that describe the important characteristics of steelhead habitat to assist habitat restoration groups.
- 8) Work with WDFW's Salmon in the Classroom Program, currently in more than 830 schools statewide, to describe healthy ecosystems and their value to steelhead populations.
- 9) Work with the Eyes in the Woods to expand the Stream Watch program.
- 10) Develop and provide recreational anglers and others with information related to artificial production and harvest through various methods including public forums, web-based steelhead information site, etc.
- 11) Maintain citizen advisory groups such as the Steelhead and Cutthroat Policy Advisory Group and the Regional Fisheries Enhancement Advisory Board to advise Department on policy issues related to steelhead. Establish ad hoc advisory groups to assist the Department in addressing emerging issues.
- 12) Develop talking points for interaction with landowners to help them understand how healthy steelhead stocks could benefit them.

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.

Abundance: the size of a salmonid population or of a component of the population expressed as numbers of fish. For anadromous populations, this number is normally expressed in terms of spawners.

Adaptive Management: Periodic, usually annual, review of performance against measurable benchmarks and goals as well as a response towards achieving these goals.

All-H Planning: Developing and implementing comprehensive hatchery, habitat, hydro, and harvest management plans that ensure the artificial production program compliments the strategies for other Hs.

Allocation Unit: A management unit or group of management units for which harvest shares are calculated. Prior court orders specify that an allocation unit comprises the steelhead returning to a single river system flowing into saltwater. The parties may, by agreement specify different allocation units if necessary.

Anadromous fish: Fish that hatch in fresh water, mature in salt water, and return to fresh water to spawn.

Artificial Production: The rearing and release of fish from an artificial culture setting such as a hatchery, remote site incubator, spawning channel or other non-natural situation.

At-Risk Stocks: Fish populations having an unacceptably high risk of extinction within a specified time horizon. Such populations are often listed as critical in the SaSI database, and may be listed or under consideration for listing under the Endangered Species Act.

Catch: The number of fish retained by a fisher.

Catch-and-Release: A non-retention hook-and-line fishery.

Condition Factor: A measure of the condition of a fish based on Comparison of length and weight. The more robust the fish, the higher the condition factor.

Conservation: The use of artificial propagation to conserve genetic resources of a fish population at extremely low population abundance, and potential for extinction, using methods such as captive propagation and cryopreservation.

Critical Population Threshold: An abundance level for a population below which: compensatory processes are likely to reduce it below replacement; short-term effects of inbreeding depression or loss of rare alleles cannot be avoided; and productivity variation due to demographic stochasticity becomes a substantial source of risk.

Critical Stock: A stock of fish experiencing production levels that are so low that loss of genetic diversity is likely or has already occurred.

Depressed Stock: A stock of fish whose status is neither Critical nor Healthy.

Diversity: Variation among individuals in physical, life history, or genetic characteristics.

Escapement Goal: A numerical threshold for the 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.

Evolutionarily Significant Unit (ESU): The smallest biological unit that can be considered to be a species under the Endangered Species Act as administered by the National Marine Fisheries Service (NMFS). A population or population group is considered to be an ESU if 1) it is substantially reproductively isolated from other conspecific population units, and 2) it represents an important component in the evolutionary legacy of the species. USFWS uses a similar term and concept called the distinct population segment (DPS), which is the wording used in the ESA itself. Thus, the ESU is the NMFS' interpretation of a DPS.

Exploitation Rate: The fishery-related mortality of fish expressed as a percentage of the estimated total run size.

Fishery Resource Manager: A tribe or the State of Washington, represented by the Department of Fish and Wildlife, with authority and responsibility over the management of harvest and hatchery programs affecting steelhead.

Gene Flow: The rate at which genetic material flows from one population, population component, or group of populations to another. Gene flow is an important concept in maintenance of among-population genetic diversity and in the linkage of hatchery and natural components of an integrated population. Gene flow is often inferred from stray rates, but such estimates are likely to be overestimates.

Genetic Conservation: Protection of long-term sustainability of wild stocks/runs by conserving genetic diversity.

Genetic Diversity: Genetically determined differences among individuals, local breeding, populations, or groups of populations.

Hatchery-Origin: Fish that have been incubated, hatched or reared in a hatchery or other artificial production facility regardless of parentage.

Hatchery Production: Fish that are reared and released from artificial culture in a hatchery situation.

Healthy and Harvestable: A self-sustaining naturally produced stock that has attained a status that will support meaningful retention and non-retention fisheries on an annual basis.

Healthy Stock: A 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.

Induced Fishing Mortality: Fish mortality above and beyond that which would occur in the absence of fishing activities (e.g. hooking mortality, net drop out and marine mammal take), and which is not reflected in landed catch records.

Integrated Hatchery Program: The term describes the intended reproductive relationship of a hatchery population relative to the local, naturally spawning population between which gene flow occurs. The principle goal of an Integrated Hatchery Program is to manage the broodstock as an artificially propagated component of a naturally spawning population wherein the natural environment drives adaptation and fitness of a composite population of fish that spawns both in a hatchery and in the wild.

Integrated Hatchery Strategy: A broodstock management strategy where the intent is for returning adults of wild- and hatchery-origin to be reproductively connected to form a single, composite stock. This requires wild-origin adults in the hatchery broodstock, and hatchery-origin adults may spawn naturally.

Long Term Goal: A multi-generation performance target.

Major Population Group: A group of historically interbreeding salmonids of the same species of hatchery, natural, or unknown parentage that have developed a unique gene pool, that breed in approximately the same place and time, and whose progeny tend to return and breed in approximately the same place and time. They often, but not always, can be separated from another population by genotypic or demographic characteristics. This term is synonymous with stock.

Management Period: The time interval during which regulatory actions are taken to meet the escapement requirements for a management unit or the allocation requirements for an allocation unit, taking into account catches of the units made outside the management period. Management periods are specific to each management unit (or aggregate of management units) and to each fishing area through which the unit(s) pass.

Management Unit (MU): A stock or a group of stocks which are aggregated for the purpose of achieving a desired spawning escapement objective.

Mark Selective Fishery: A fishery requiring the release of fish lacking an adipose fin.

Maximum Sustained Harvest (MSH) Level: A biological reference point representing the stock size that will support the largest level of harvest mortality that can be maintained indefinitely without diminishing the productive capacity of the resource, given current conditions of habitat and environmental fluctuations.

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.

Mitigation (mitigation hatchery): The use of artificial propagation to produce fish to replace or compensate for loss of fish or fish production capacity resulting from the permanent blockage or alteration of habitat by human activities.

Native-origin: An indigenous stock of fish that has not been substantially impacted by genetic interactions with non-native stocks or by other factors (such as artificial selection) and is still present in all or part of its original range.

Natural-Origin: Fish that are produced by spawning and rearing in the natural habitat, regardless of parentage.

Natural Production: Fish that spawn or rear entirely in the natural environment. These fish may be the offspring of natural or hatchery production.

Natural Stock: Fish that are produced by spawning and rearing in the natural habitat, regardless of parentage.

Natural Stock Reserve: A network of wild stock populations across the state where stocks are not planted with hatchery steelhead and are largely protected from the effects of hatchery programs (i.e. gene bank).

Non-native: With respect to a particular location, fish populations that exist, either because of migration or introduction, that were not historically present.

Non-Treaty: All fishers except those with reserved rights identified in the Stevens-Palmer treaties.

Population (Major Population Group): A group of interbreeding salmonids of the same species of hatchery, wild, or unknown parentage that have developed a unique gene pool, that breed in approximately the same place and time, and whose progeny tend to return and breed in approximately the same place and time. They often, but not always, can be separated from another population by genotypic or demographic characteristics. This term is synonymous with stock.

Productivity: A stock's intrinsic rate of increase. The higher the productivity, the better the population will fill the habitat and the more resilient it will be to harvest and to survive other sources of mortality.

pHOS: Proportion of spawners consisting of hatchery-origin fish.

pNOS: Proportion of spawners consisting of natural-origin fish.

pHOB: Proportion of broodstock consisting of hatchery-origin fish.

pNOB: Proportion of broodstock consisting of natural-origin fish.

Proportionate Natural Influence (PNI): In an integrated hatchery program, a mathematical relationship between gene flow from the hatchery to the natural component and from the natural to the hatchery component, that determines the degree to which natural selective forces direct the expression of a trait. Mathematically, $PNI = pNOB / (pHOS + pNOB)$. The HSRG guideline for properly integrated populations is that PNI should exceed 0.5. For stocks of moderate or high biological significance and viability, PNI should exceed 0.7, be at least 0.1 to avoid divergence of the hatchery population from the natural component, even when pHOS is zero (HSR, WDFW, and NWIFC 2004).

Run: The sum of stocks of a single salmonid species which migrate to a particular region, river or stream of origin at a particular season.

Segregated Hatchery Program: The intended reproductive relationship of a hatchery population relative to a naturally spawning population, which are reproductively isolated from one another. The principal intent is to propagate a genetically segregated hatchery stock that is adapted to perform more optimally in artificial culture than in the wild, irrespective of the ability of returning adults to reproduce naturally or confer any benefits to naturally spawning populations.

Segregated Hatchery Strategy: A broodstock management strategy where the intent is for the hatchery stock to have no reproductive interactions with wild stocks. Also referred to as an Isolated Hatchery Strategy.

Selective Fishery: A fishery with time, area, gear, or retention regulations designed to reduced impacts on non-target species or stocks.

Selective Gear Rules: No bait, and only unscented flies or lures with a single barbless hook may be used.

Short Term Goal/Benchmark: An intermediate performance target that is basic to the adaptive management evaluation process.

Mark Selective Fishery. A fishery requiring the release of fish lacking an adipose fin.

Stock: A group of fish within a species, which is substantially reproductively isolated from other groups of the same species.

Viable: Negligible risk of extinction over a specified time period (McElhany et al. 2000). For the purposes of this plan, a viable steelhead population is one that has a less than 5% probability of extinction over at least 100 years.

Viable Salmonid Population (VSP) Parameters: Parameters that are used to evaluate the status of a given stock. The four parameters are abundance (A), productivity (P), diversity (D), and spatial structure (S) (McElhany et al. 2000).

Viability Stressors: Habitat, harvest, or hatchery actions that affect population VSP attributes (abundance, productivity, diversity, and spatial structure) in a way that currently results in a significant reduction in the viability of a population.

Wild (see natural stock): Naturally produced fish from a locally adapted stock regardless of origin or parentage. Still used in harvest record keeping Catch Record Cards (CRC) to indicate steelhead with adipose fins intact (not marked at the hatchery for harvest).

Wild Fish: A naturally produced fish from a locally adapted stock regardless of parentage.

Wild-Origin: The progeny of fish that were spawned naturally from a locally adapted stock regardless of parentage.

Wild Steelhead Release (WSR): A hook-and-line fishery that requires wild steelhead (defined by not having fin clips) to be released. Hatchery steelhead (defined by having fin clips) may be retained.

LIST OF ACRONYMS AND ABBREVIATIONS

BRAP	Benefit-Risk Assessment Program
BRP	Biological Reference Point
CWT	coded-wire tag
ER	Exploitation Rate
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FMP	fishery management plan
HSRG	Hatchery Scientific Review Group
IHOT	Integrated Hatchery Operations Team
ISBM	individual stock-based management
MSH	maximum sustainable harvest
MSY	maximum sustainable yield
NA	not available
NMFS	National Marine Fisheries Service
NWIFC	Northwest Indian Fisheries Commission
pHOS	Proportion of hatchery origin spawners
pNOS	Proportion of natural origin spawners
pHOB	Proportion of hatchery origin broodstock
pNOB	Proportion of natural origin broodstock
PNI	Proportion of natural influence
PUD	Public Utilities Department
RER	rebuilding exploitation rate
R/S	Recruit per spawner
SaSI	Salmonid Stock Inventory
TRT	Technical Review Team
VSP	Viable Salmonid Population
WDF	Washington Department of Fisheries
WDFW	Washington Department of Fish and Wildlife
WWTIT	Western Washington Treaty Indian Tribes

LITERATURE CITED

- Hatchery Scientific Review Group, Washington Department of Fish and Wildlife, and Northwest Indian Fisheries Commission (HSRG, WDFW, and NWIFC). 2004.
HSRG/WDFW/NWIFC Technical Discussion Paper #1: Integrated Hatchery Programs.
- McElhany, P., M.H. Ruckelshaus, M.J. Ford, T.C. Wainwright, and P. Bjorkstedt. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-NWFSC-42.

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 fish 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: Create and agency environment that nurtures professionalism, accountability, enthusiasm, and dedication in order to attract, develop, and retain a workforce that can successfully carry out the mandate of the agency.