



Two Management Strategies for Washington Steelhead Compared

by Richard Burge

— *Wild Steelhead Coalition* —

In this special report, Richard Burge, of the Wild Steelhead Coalition, compares and analyzes steelhead management plans, one developed by the Coalition and the other by Washington Department of Fish and Wildlife. He is retired from the Washington Department of Fish and Wildlife and co-author of the "The Status of Wild Steelhead and Their Management in Western Washington: Strategies for Conservation and Recreation" with Nate Mantua, Jack Berryman and Larry Doyle

You can learn more about the Wild Steelhead Coalition on their Web site at www.wildsteelheadcoalition.com.

On April 6, 2007, the Washington Department of Fish & Wildlife (WDFW) released a draft steelhead management plan, "Statewide Steelhead Plan, Volume 1. Statewide Policies, Strategies and Actions" to an ad hoc committee of stakeholders for review. In May 2006 the Wild Steelhead Coalition (Coalition) made available its white paper, "Status of Wild Steelhead and their Management in Western Washington: *Strategies for Conservation and Recreation*." This article is a review and comparison of the management strategies contained in those two documents, with recommendations for improvements in the clarity and the conservation measures in the WDFW plan.

The Present WDFW Management Program

WDFW and the Washington Indian Tribes have been wedded to an aggressive and often failing management policy of Maximum Sustaining Harvest (MSH) for wild salmonids since a few years after the Boldt decision of 1974. Since 1985, MSH management models used for wild steelhead have been

based on several fundamental flaws in the MSH concepts including the invalid assumptions of a static environment, inaccurate estimates of the upcoming run sizes, and the theory of compensation: an expectation that productivity will improve and repopulate rivers when the spawning stock is low that has not played out for many severely depleted populations in recent decades. Under MSH guidelines, life history and genetic diversity and spatial (river) distribution have too often been ignored in favor of

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absolute modeled numbers that have set minimal spawner escapement needs and maximized the number of harvestable fish.

The Puget Sound and coastal Washington salmon and steelhead hatchery system has more than 100 facilities operated by the state and tribes. The program has been more concerned with producing salmon and steelhead for harvest than on the harm the hatchery fish can do to wild fish genetics and production.

In general, the harvest rates imposed on Washington steelhead stocks by an aggressive management system have trumped conservation concerns and spawner needs, and the result has been devastating. Five of the seven populations, called Distinct Population

Segments (DPSs) by NOAA Fisheries, of wild steelhead in Washington are now listed as Threatened under the Endangered Species Act (ESA) by NOAA Fisheries. The remaining two populations, Olympic Peninsula and Southwest Washington DPSs, are classified by the state as healthy even though their abundances are far below historical levels. These stocks are often compromised by the state giving the coastal tribes a fair portion of the sport 50% share and agreeing to escapement goals lower than those recommended by WDFW biologists in 1985.

In 2002, sport fishers, alarmed at the disappearing wild runs, began a series of efforts to get the Washington Fish and Wildlife Commission (Commission) to eliminate the sport harvest of wild steelhead statewide to help prevent further declines of these runs. The Commission, after holding a well-attended hearing on steelhead, responded by reducing the season limit from a potential of 30 wild fish per season to five, a temporary placebo thrown to a concerned sport community. WDFW records later revealed that only 1% of the sport fishers harvested more than five wild fish, indicating that the reduced limit would have little effect on the total harvest.

In 2004, after seeing data on the declining and depleted wild steelhead runs presented to them by the Coalition, the Commission showed a renewed concern for wild steelhead stocks and imposed a two-year moratorium on the harvest of wild steelhead. Politics soon stirred the pot with harvest supporters claiming foul play to the adoption of the harvest moratorium, and the Commission held another well-attended hearing, with support overwhelmingly in favor of the moratorium. The Commission eventually voted to eliminate the moratorium and limit the killing of wild steelhead to

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one fish per angler per year.

The WDFW Steelhead Science Paper

WDFW recognized it could no longer ignore the declining wild steelhead runs or the sport fishers' concerns and announced in early 2004 that it would write a new Steelhead Management Plan. The plan was to be preceded by a science paper (the draft titled "*Oncorhynchus mykiss: Assessment of Washington State's Anadromous Populations and Programs*") that would "lay the foundation for the development of improved management plans...that assure the productivity of Washington's steelhead for future generations." That science paper, after more than two years in writing and undergoing three drafts with critical reviews by stakeholders, was put on the back burner when WDFW decided in mid-2006 that it was past time to begin the writing of its new plans. WDFW was especially interested in completing a new Puget Sound Regional Plan to avoid an upcoming ESA listing by convincing NOAA Fisheries that Puget Sound Steelhead were already recovering. However, Puget Sound Steelhead were listed as Threatened on May 7, 2007.

WDFW Statewide and Regional Management Plans

WDFW has prepared a draft Statewide Steelhead Plan, an umbrella document that will go through the State Environmental Policy Act process and be completed as an Environmental Impact Statement (EIS). This Plan will guide the development of both Regional and Watershed Plans. Watershed Plans will be prepared over the next five years, with those in ESA listed or State classified critical areas given first priority and completed within two years. When all watershed plans for a WDFW Region are completed, they will be rolled up as the Regional Plan. When completed, the statewide plan and regional plans will become the Department's steelhead management policies and strategies and difficult to change unless: (1) a change is request-

ed by the Commission, (2) new major management science becomes available, or (3) a policy decision is made by the WDFW Director.

Wild Steelhead Coalition Plan

The Coalition's publication included a status review of the wild stocks in western Washington Rivers and a review of the scientific and modeling problems associated with MSH theory and management. The publication included an adaptive wild steelhead management plan designed to recover depleted stocks, rebuild stocks to their

and restoration of these stocks to healthy levels." The Department's section on fishery management starts with the following Policy Statement: "Fisheries will 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... Within the constraints of the natural production policy and tribal harvest-sharing obligations, the Department will strive to provide diverse recreational fishing opportunities."



An angler casts for winter run steelhead on Washington's Skykomish River. Photograph by Jim Yuskavitch.

potential abundance levels and provide sustained recreational fishing opportunities.

To provide a comparison of these two plans, I have elected to use the following categories: Fisheries/Harvest Management; Diversity; Hatcheries; and Habitat.

Fisheries/Harvest Management

WDFW Plan:

The WDFW Natural Production Policy states that "*Steelhead management shall place the highest priority on the protection of wild steelhead stocks*

For wild stocks important for recovery and conservation, escapement objectives will follow these guidelines: "For ESA-listed and State classified Critical or Depressed stocks, WDFW will promote a trend of increasing numbers of wild spawning steelhead through a series of interim, increasing escapement objectives. For state Healthy stocks, WDFW will maintain stocks with an escapement objective at least, if not more than, the number of wild spawners associated with Maximum Sustained Harvest." The Department will further account for all sources of fishery related mortality,

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provide diverse fishing opportunities (harvest and catch and release) and adaptively manage fisheries to assure plans are responsive to variable productivity, regional recovery and conservation goals, and that economic and cultural benefits are maximized.

Coalition Plan: The Coalition suggested that wild steelhead need a more conservative management policy than MSH to allow stocks to recover and sustain themselves under the many management, political, biological and environmental problems and variables of the 21st century. The Coalition stated that: “(1) unpredictable atmospheric and oceanic cycles can produce large swings in productivity that can not be forecast; (2) impending run sizes can not be accurately determined; (3) the theory of compensation (high replacement rates at low stock levels) is flawed; (4) lost diversity will take multiple generations to recover; and (5) riverine nutrient levels have been greatly reduced.” These problems are all large obstacles to the recovery and maintenance of healthy runs using MSH models.

The Coalition therefore developed an adaptive management program by modifying the usage of MSH parameters and developing a Harvest Impact Model with the following criteria:

1. “The total run size and the pre-season planning should include all harvest impacts (harvest, wild steelhead release (WSR) mortality, net drop out mortalities, marine mammal take from nets, illegal harvest estimates, etc). Allow a maximum 10% total sport and tribal harvest impact at run levels below 150% of the escapement goal.

2. Pre-season run forecasts should be adjusted downward based on the historical forecast error for each specific stock. No fishery, directed or incidental, should be planned or allowed when MSH-defined spawner escapement is projected to fall below 100% of the goal.

3. For runs predicted between 100% and 120% of the MSH defined escapement goal, allow only Wild Steelhead Release (WSR) fisheries and selective

gear.

4. For runs predicted between 120% and 150% of the MSH defined escapement goal, allow WSR sport fisheries.

5. For run-sizes predicted to be above 150% of the escapement goal, allow a cumulative 50% harvest impact of the segment of the run above 150%.

6. Allow only barbless hooks in all sport fisheries to decrease the mortality rate of hooked and released fish.”

The Coalition further emphasized offering fisheries that focus on Maximum Sustained Recreation (MSR) benefits rather than Maximum

Wild steelhead may recover with the WDFW plan during high productivity periods but will quickly decline when productivity is low.

Sustained Harvest for wild steelhead. This will maximize angler opportunities to fish for, rather than shorter opportunities to harvest, wild steelhead. It will further increase the abundance of wild spawners and help buffer stocks against downturns in productivity.

Recommendation: The WDFW Plan has taken a major step forward by stating that natural production is the highest priority of steelhead management. However, the Coalition's Plan comes much closer to fulfilling this new priority by recommending an escapement/harvest plan that is considerably more adaptive and conservative than MSH management.

Wild steelhead may recover with the WDFW plan during periods of high productivity but will also quickly decline in abundance during low productivity cycles. MSH harvest planning is designed to remove all fish

above the defined escapement goal, and the stock is set up to decline quickly below those minimum requirements when productivity falls below replacement. Because marine survival appears to follow 10 to 20 year cycles, harvest management at MSH escapement goals, or even at levels that are 10 to 20% higher, will mean sport and tribal fisheries may be closed as often as they are open, and for long periods of time.

Stocks will also not be afforded the ability to recover to near-historical levels under MSH management. Escapement planning should be modified with significant buffers above the MSH defined escapement to allow stocks to rebuild to near-historic levels of abundance, diversity, productivity and spatial structure and regain their resilience to weather long periods of low productivity.

The Coalition's recommendation to emphasize higher escapements (150%) and Maximum Sustained Recreation (MSR) is more responsive to placing highest priority on natural production. It also responds to the dramatic change in angling preferences during the last 50 years from harvest to catch and release of wild fish.

Long term goals that are suggested in the WDFW plan should be designed to recover stocks to near-historical population levels. These historical abundances have not been considered or determined at this time by WDFW, yet for many populations they may be more than 10 times the present stock abundances.

Wild Salmonid Management Areas (the Hatchery Scientific Review Group recommended Wild Steelhead Management Areas) and ecosystem management should be established in all major river basins to preserve wild fish genetics (the WDFW Wild Stock Gene Bank), protect rainbow trout and all juvenile wild salmonids, and reduce impacts on spawning wild fish. These areas can easily be established in the watershed above locations where hatchery fish are released and assure that both the diversity of fish and habitats found in a river basin are covered. Wild Fish Release (WFR) and selective gear use in these areas would allow WDFW to continue the existing fisheries in these areas when annual runs

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are projected to be above their needed spawner escapements.

The Department should take a leadership role in requiring live release of non-target salmonids, especially of ESA listed or state classified depressed and critical species, in the sport, commercial and tribal fisheries. This should include fisheries where wild fish are a significant by-catch, such as listed steelhead in the commercial Columbia spring Chinook fishery.

Foregone opportunity should be eliminated from all WDFW and tribal discussions of wild steelhead. If one side wants to reduce or eliminate harvest, using their fish for other purposes such as conservation, the other should not be able to claim any part of that 50% share.

Life History and Genetic Diversity

WDFW Plan: The Natural Production strategy includes the following statements. 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. A few specific diversity strategies are found throughout the plan and include:

(1) *“Protect juvenile steelhead and resident rainbow trout by closing fisheries during the smolt migration period and through the use of minimum fish size, gear restrictions and bag limits; (2) negotiate with action agencies to improve upstream and downstream survival of steelhead, including kelts, through hydro facilities; and (3) develop Regional Management Plans that identify the expected trajectory for the diversity, spatial structure, productivity and abundance of each wild stock.”*

Coalition Plan: The Coalition identified life history and genetic diversity as being as important as abundance in maintaining healthy and resilient wild steelhead populations. The Coalition Plan specifically recommended:

(1) *“Recovering seasonal runs: All Western Washington Rivers should be regulated by WFR and barbless hooks for wild steelhead during December and January to rebuild these once*

large and important runs; (2) Rainbow Trout: All rivers with wild steelhead runs should be closed to the harvest of rainbow trout unless research has shown they are not involved in specific rivers in spawning interactions with wild steelhead. Only selective gear and WFR should be allowed during directed fisheries on rainbow trout. Every management option should be used to minimize the hooking mortality of steelhead parr, smolts and rainbow trout; (3) In addition, the Coalition recommends rebuilding all tributary and mainstream runs that have been reduced due to harvest, habitat changes and other factors.”

WDFW should take a leadership role in requiring the release of non-target salmonids, especially ESA-listed, critical and sensitive species.

Recommendations: Although I have stated that the WDFW plan is a change in WDFW policy as it places natural production as its highest priority in management, the plan remains too general to direct the development of Regional Plans. WDFW must be more specific throughout the plan and state the important parameters that should be addressed in Watershed Plans. For example, the important life history and genetic diversity traits of wild steelhead that need rebuilding and/or monitoring should be included in the WDFW plan with suggested methods for determining their original levels, their recovery trajectories, and monitoring programs to assure maintenance of their recovered levels.

A short list of these diversity traits includes: natural abundance of rainbow trout; historical strength of each segment of the run during the winter and summer season; natural riverine abundance of kelts; historical abun-

dance of runs to each tributary and to the main stream; abundance or relative abundance of smolts; number of spawning adults by month; ratio of males to females in anadromous spawning population, including the ratio during each segment of the run; and ratios of year classes in the nursery and spawning populations.

WDFW should analyze the change in seasonal winter runs, by river, and design management strategies to recover runs that have declined during specific months/periods. The Coalition found a marked decrease in the December and January runs when comparing landing data in the 1950's to recent data. WDFW should develop improved strategies to protect rainbow trout and juvenile salmonids from direct or indirect fishing mortality.

Hatcheries

WDFW Plan: The Plan states: *“select the hatchery type (integrated or segregated) based on watershed goals and objectives and a scientific assessment of the potential risks and benefits of each program. Maintain at-risk stocks by implementing programs such as kelt reconditioning and hatchery conservation programs. Assess the benefits and risks of current programs, including economic benefits, relative to the diversity, spatial structure, abundance and productivity of wild stocks. Monitor, evaluate and adapt each program and develop a process for making revisions as needed. Establish a network of Wild Stock Gene Banks with one for each major population in rivers that do not have releases of hatchery origin steelhead.”*

Integrated programs implemented to enhance harvest opportunities will achieve a Proportionate of Natural Influence (PNI) equal to or greater than 0.70 on average and use brood stock indigenous to the watershed. Segregated programs used to enhance harvest opportunities will result in a gene flow rate of less than 2% from hatchery to wild stocks and use brood stock that originated from releases of juveniles in that watershed.”

Coalition Plan: The Plan says: *“Implement the HSRG principles and*

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recommendations including: (1) develop a robust system of monitoring and evaluation of hatchery performance, (2) adaptively manage hatcheries based on monitoring findings, (3) establish wild steelhead management zones where hatchery fish are not planted, (4) make a clear distinction and practice between segregated and integrated programs. Hatchery steelhead smolts should not be released in rivers falling below their respective escapement goals for more than two years.

“Before new integrated hatcheries are planned, existing integrated hatcheries should be fully evaluated for their impacts on wild steelhead, including changes in fitness and diversity, and competition with wild smolts.

“Implement hatchery evaluation experiments related to selected hatchery closures and unsupplemented reference streams, as recommended by the Hatchery Scientific Review Group (HSRG), Independent Scientific Advisory Board (ISAB), and the Salmon Recovery Science Review Panel (SRSRP). Study the productivity of marine waters to assure hatcheries do not release excess smolts when productivity is low, and create excessive competition with wild fish, decreasing their growth and survival.”

Recommendations: Segregated, Integrated and Conservation hatcheries must be fully monitored and evaluated for their short and long term impacts on wild stocks, including reproductive fitness, life history and genetic diversity and gene flow. This should include operational hatcheries that conform to the HSRG recommendations.

WDFW needs to study the rate and impacts of introgression and gene flow from segregated hatchery programs on wild fish as it occurs today. HSRG recommendations should be implemented for all segregated programs.

WDFW has indicated they plan to achieve a 0.70 PNI on average for integrated hatcheries. The HSRG recommended the PNI for integrated programs be 0.85 and higher with less than 15% of the natural spawning stock composed of hatchery stock. Even 0.85 may be too high a risk (too

low a PNI) for wild steelhead, given their large suite of life history and genetic traits. Impacting even a few of these traits from hatchery domestication may depress the reproductive fitness, productivity and resilience of wild populations. Until multi generational studies are completed to understand the impacts of integrated programs at several levels of PNI, it would be scientifically advisable to

Conservation hatcheries should not be planned or implemented unless the extinction risk to a stock is significant.

maintain a PNI well above 0.90 with less than 10% of the natural spawning stock composed of hatchery fish. In addition, no integrated or segregated steelhead hatchery program should be designed to purposely allow returning hatchery recruits to spawn in the wild.

Conservation hatcheries should not

be planned or implemented unless the stock is at a significant risk of extinction and should follow the guidelines recommended by the HSRG.

Habitat

WDFW Plan: WDFW's plan for habitat protection and restoration includes encouraging local problem solving, providing technical expertise, providing internet tabular and map-based habitat information, and promotion of an ALL-H Strategy ecosystem approach to link hatchery, habitat, hydro and harvest management. WDFW will promote funding for habitat restoration, implement nutrient enhancement and develop a Climate Response Plan.

Coalition Plan: The Coalition does not have a section on habitat per se in their Plan.

Recommendations: The WDFW plan reads more like an agency that will follow other agencies' and organizations' habitat work rather than taking a strong lead in the necessary directions of habitat recovery. The WDFW legislative mandate is to... “preserve, protect, perpetuate, and manage the wildlife and food fish, game fish and

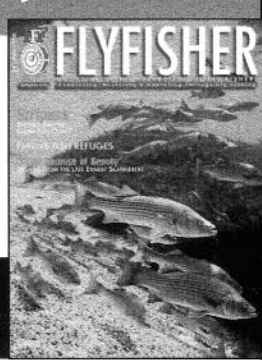
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shellfish in state waters and offshore waters.” This mandate should be recognized as inclusive of all protective functions of the wild fish including habitat protection and recovery.

The WDFW and other appropriate state agencies should initiate an investigation of the historical condition of wild salmonid watershed habitat before old growth logging, farming diversions, and stream side development, and then initiate comprehensive

ue to decline.

WDFW needs to be more aggressively protective of habitat by using its Hydraulic Project Approval (HPA) statutory authority [Editor’s Note: Anyone involved in construction or other work projects in or near streams and water bodies needs approval from WDFW], where it exists, to stop habitat destruction, and where it doesn’t exist, to persuade other agencies that have that authority to do so.

actions and details that must be addressed in the Watershed Plans.

As the Statewide Steelhead Plan goes through further drafts, it will be reviewed by the Washington Fish & Wildlife Commission and passed through the State EIS process. Wild steelhead activists must participate in these processes to assure that needed additional conservation measures are included and that the plan does not stray from its present scientific standards due to political tinkering.

When the Statewide Plan is completed, the Watershed Plan process will begin and angler/conservationists must stay involved in the planning meetings for the development of those documents. The Watershed Plans will be the real test of how future steelhead management is designed and implemented. It is in these plans that we will see how WDFW managers propose to recover and monitor wild steelhead life history and genetic diversity, rebuild their abundance using adaptive and conservative MSH reference points, reform hatcheries to reduce their present impacts on wild fish, and provide new programs to recover and protect all wild salmonid watersheds.

We all have to remember that wild fish don’t have an ability to influence these plans. They don’t vote, they can’t speak out, and there are developers and habitat users that want you to think they aren’t even valid Washington residents. If wild steelhead populations are to become healthy and prosperous again, and further stock declines are to be prevented, we are the ones that will have to ramrod the necessary measures into state politics. We cannot expect the federal and the state agencies will do this without our continuous pressure.



A sound steelhead management plan that puts conservation ahead of harvest is key to ensuring the long-term survival of wild Washington steelhead that inhabit rivers such as the Quinault. Photograph by Jim Yuskavitch

new programs to recover, to as similar a state as possible, those conditions. It is clear that Washington’s watersheds no longer store as much of the winter precipitation nor disperse it during the summer as they did in the 1800s, and this trend has accelerated in the last 50 years. Today’s large floods cause heavy watershed erosion, remove stream corridor vegetation and soils, deposit sand and mud on the spawning beds, wash out important in-river habitat, channelize rivers and scour out recently deposited salmon eggs. **Without major actions to restore complete Washington watersheds, Washington wild salmonids will contin-**

Final Comments

WDFW has made an excellent start in developing the type of management concepts and systems for wild steelhead that are needed to prevent further declines and initiate the recovery process toward historical levels. However, the plan does not include many of the details, parameters or management changes needed to sustain wild runs. This plan is one of the most important documents that will be prepared by the agency to manage steelhead for several decades. It should be comprehensive in recommending all the specific concepts,

