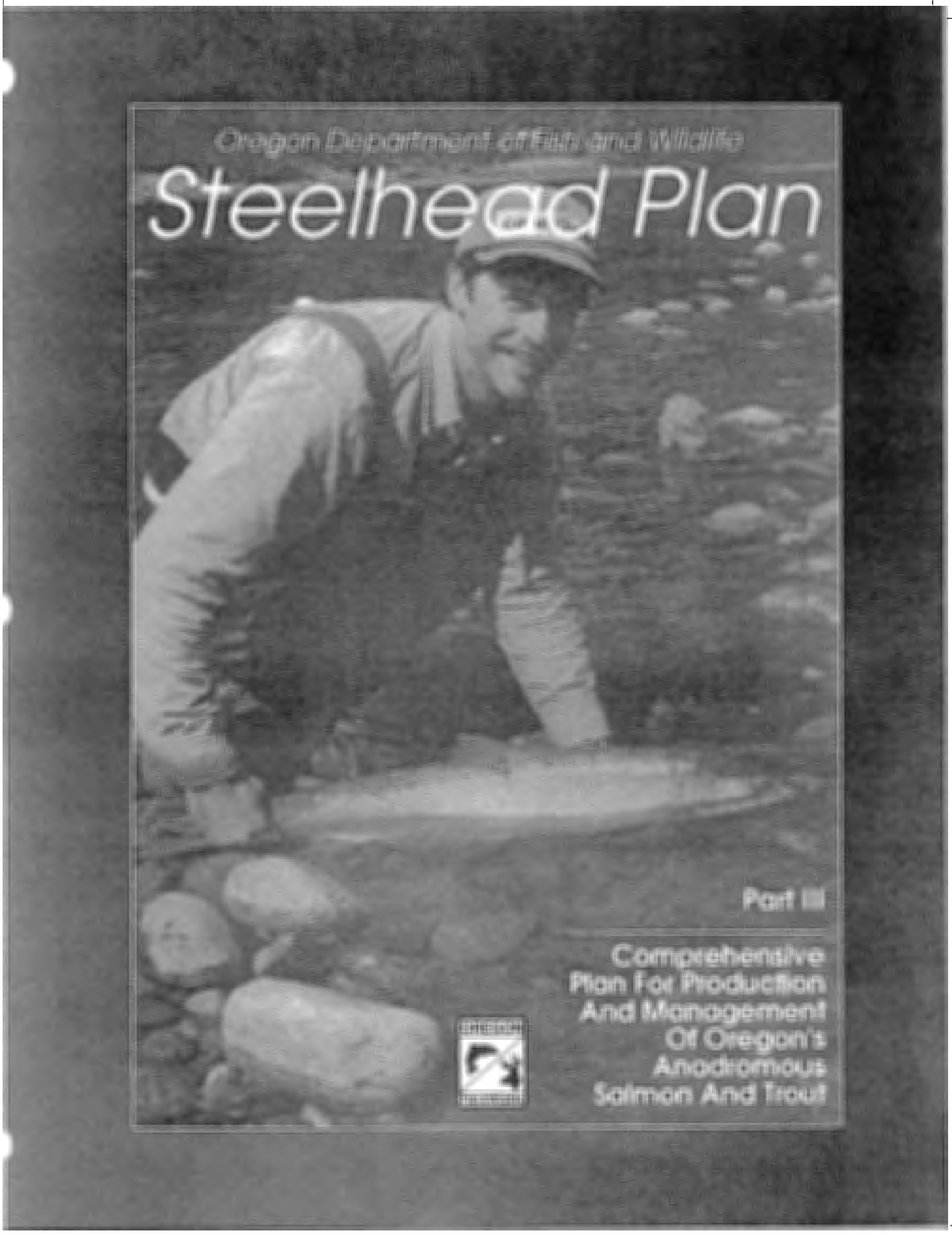
Oregon Department of Fish and Wildlife
Steelhead Plan
Part III
Comprehensive
Plan For Production
And Management
Of Oregon's
Anadromous
Salmon And Trout

CONTENTS

INTRODUCTION

This plan is a revision of The Comprehensive Plan for Production and Management of Oregon's Anadromous Salmon and Trout, Part III: The Steelhead Plan, adopted by the Fish and Wildlife Commission in 1986. The Steelhead Plan is Oregon Department of Fish and Wildlife's (ODFW) statewide overview of steelhead management and is part of a larger planning program to develop a long-term approach to conserving and utilizing Oregon's fish resources. Species plans, along with basin plans, are a primary means of implementing ODFW fish management policies. They provide a general framework for basin planning and subsequent management of individual populations by providing background information, identifying information needs, suggesting management approaches and defining allowable activities. The planning process allows the public and other agencies to participate in developing ODFW management programs.

Management of Oregon's diverse steelhead resource is directed by federal court mandates (US vs. Oregon), co-management with the Treaty Tribes (Confederated Tribes of Warm Springs Reservation of Oregon, Confederated Tribes of the Umatilla Indian Reservation, Nez Perce Tribe and Yakama Indian Nation), legislation, Oregon Fish and Wildlife Commission policy, agreements between ODFW and other agencies, and administrative direction from ODFW. The Steelhead Plan contains policies, goals, objectives, strategies and actions that guide the management of steelhead statewide. The plan recognizes the biological diversity among steelhead populations and the varying issues and challenges facing steelhead management throughout Oregon, and therefore allows basin plans to tailor management to fit specific circumstances.

The Steelhead Plan was drafted by a Technical Committee of ODFW personnel that included Bob Buckman, Mick Jennings, Ken Kenaston, Bill Knox, Bob Lindsay, Dave Loomis, Curt Melcher, Nancy MacHugh, Ray Temple, Mark Wade and Mary Jo Wevers. An advisory committee comprised of representatives of angling and conservation organizations, and other interested citizens reviewed drafts of the revised plan and suggested improvements. Members of this committee were:

Jerry Briggs	Oregon Guides and Packers
Doug Cramer	Public
Gordon Ferlitsch	Oregon Trout
Gary Gilchrist	Tillamook Bay Guides
Wayne Hams	Public
Bob Hissong	Umpqua Fisherman's Association
Kelly O'Neill	Association of Northwest Steelheaders
Guy Schoenborn	Tackle Industry

This plan will be made available to the public for review and comment, and then submitted to the Fish and Wildlife Commission for adoption.

Cover Photo: ODFW Research Biologist Jay Nicholas releases a 12 pound female winter steelhead. Photo by Bob Hooton.

GOALS OF STEELHEAD MANAGEMENT

Steelhead management in Oregon is guided by many existing policies previously adopted by the Fish and Wildlife Commission. Major direction is set forth in Oregon Adiministrative Rule (OAR) 635 Division 07- Fish Management and Hatchery Operation which includes General Fish Management Goals, the Natural Production Policy, the Wild Fish Management Policy, Wild Fish Gene Resource Conservation Policy and Hatchery Fish Gene Resource Management Policy (See APPENDIX G). ODFW's management of all fish species is guided by OAR 635-07-510 -- Fish Management Goals, section (1):

> *"The overriding goal of fish management is to prevent the serious depletion of any indigenous fish species through the protection of native ecological communities, the conservation of genetic resources, and control of consumptive uses such that fish production is sustainable over the long term."*

In addition OAR 635-07-522 -- General Policies for Natural Production Management states:

> *"It is the policy of the Commission to protect and promote natural production of indigenous and, where desirable, foreign fishes. Pursuant to Oregon Revised Statute (ORS) 496.012, ORS 496.435, ORS 506.036, and ORS 506.109, the Commission's overriding responsibility, through the management of individual populations, is to prevent the serious depletion of any indigenous species. To the extent consistent with that mandate, it is also the Commission's responsibility to manage fish for optimum economic, commercial, recreational, and aesthetic benefits for present and future generations."*

These policies have been interpreted as goals specifically for steelhead management as follows. This plan defines "healthy population" as a population that maintains a high level of productivity (ability of the population to rebuild if escapement is depressed) and adaptive capacity (gene resources).

1. **Sustain healthy and abundant wild populations of steelhead.**

2. **Provide recreational, economic, cultural and aesthetic benefits from fishing and non-fishing uses of steelhead.**

3. **Involve the public in steelhead management and coordinate ODFW actions with the Tribes and other agencies.**

MANAGEMENT APPROACH AND OBJECTIVES

Goal 1. Sustain healthy and abundant wild populations of steelhead.

Sustaining healthy and abundant wild populations of steelhead into the future while providing recreational, economic, cultural and aesthetic benefits desired by people now will require: (1) protecting and restoring habitats, (2) allowing sufficient escapement of adults to spawning areas, (3) managing hatchery programs so that they are compatible with wild populations, and (4) monitoring the status of wild populations.

Protect and Restore Habitat

Loss of natural production of steelhead because of degradation of freshwater habitat due to logging, mining, gravel removal, agriculture, grazing, road construction, pollution, dams, water diversions and other diverse human activities has reduced benefits from steelhead and reduced the probability of long-term persistence of individual steelhead populations. The Department strongly advocates and supports habitat protection and restoration on private and public lands. Habitat protection and restoration are necessary to maximize productivity and maintain healthy populations. The Department opposes degradation of habitat quantity or quality that poses a risk to meeting natural production objectives of management plans.

Although ODFW does not have regulatory authority over most land and water resources vital to fish production, the Department reviews permit applications, management plans and development proposals, and then makes recommendations to regulatory agencies and land managers. All of the Habitat Conservation Division's time and over half of field personnel's time is spent protecting habitat through permitting processes and through negotiations with individuals, groups and agencies.

Objective 1. Protect and restore spawning and rearing habitat.

Current actions

1.1 ODFW will continue to work with regulatory agencies and habitat managers to protect steelhead habitat.

1.2 ODFW will continue to work with agencies, corporations and individuals who manage habitat to develop and implement rehabilitation plans.

1.3 ODFW will continue to monitor the condition of freshwater habitat through such programs as the Aquatic Inventories Project.

New actions

1.4 Basin plans will identify and present strategies for protection and restoration of areas that are important to steelhead for adult holding, spawning and juvenile rearing. This will most likely be done in conjunction with habitat measures for other species.

1.5 Basin plans will consider the desirability and feasibility of reestablishing steelhead populations in habitats where they have been eliminated by human activities.

Objective 2. Provide safe migration corridors.

Current actions

2.1 ODFW will continue programs to eliminate mortality of steelhead at dams, water diversions and other artificial barriers to upstream and downstream migration.

New actions

2.2 ODFW will prepare summaries of existing information on: 1) predation by seals and sea lions on steelhead, 2) predation by birds on migrating smolts, and 3) mortality of smolts and adults at dams and water diversions. These summaries will be made available to the public. ODFW will take appropriate actions if warranted based on the findings in these summaries.

Allow Sufficient Escapement of Adults

Providing the opportunity for optimum harvest benefits is consistent with natural production management. However, the Department opposes harvest strategies that endanger the long-term viability of a population or that pose a risk to meeting natural production objectives of management plans.

Angling regulations requiring the release of wild steelhead can be used to maintain the opportunity to angle while minimally impacting escapement of wild fish where the number of wild adults returning can not be accurately predicted.. Other options for protecting wild escapement, but that restrict angling opportunity, include shorter seasons, reduced bag limits for wild steelhead, restricting particular gear types, and closing areas. Where wild steelhead populations are not considered healthy, or there is uncertainty about the status of wild steelhead populations (*See* APPENDIX B), management will take a conservative approach and angling regulations will require release of wild fish. All hatchery produced smolts released in Oregon are fin marked. As of 1995, regulations allow non fin clipped fish to be kept only in the Walla Walla, John Day, McKenzie and some streams in the Southwest Zone. Before continuing harvest of wild steelhead on these or any other wild populations, it must be demonstrated that harvest can be regulated such that it does not jeopardize future production, and the proportion of hatchery fish in the naturally spawning population meets guidelines in the Wild Fish Management Policy.

Objective 3. Protect wild populations of steelhead from over harvest.

Current actions

3.1 A variety of angling regulations have been adopted by the Commission to protect wild steelhead populations from over harvest.

3.2 Tribal commercial, ceremonial and subsistence fisheries in the Columbia River will continue to be managed under the Columbia River Fish Management Plan.

3.3 ODFW will continue to mark all hatchery steelhead released as smolts so that wild fish can be released while harvesting hatchery fish, even in streams where release of wild steelhead is not required.

New actions

3.4 ODFW will prepare summaries of existing information on: 1) trout angling impacts on production of steelhead smolts, 2) mortality of steelhead as a result of catch-and-release angling and, 3) catch estimates of steelhead originating in Oregon in all sport, ceremonial, subsistence, commercial fisheries and the drift net fisheries in the Pacific Ocean. These summaries will be made available to the public. ODFW will take appropriate actions if warranted based on these summaries.

3.5 Allow harvest of wild steelhead only where the population is considered healthy (See Goals of Steelhead Managent), harvest does not jeopardize future wild production, and the proportion of hatchery fish in the naturally spawning population meets guidelines developed for OAR 635-07-527 (2) (See Appendix H).

3.6 Work with the Tribes to reduce harvest of wild steelhead where escapement is low.

Operate Hatchery Programs so that they are Compatible with Wild Populations

The Department recognizes the long term sustainability of wild populations requires conservation of life history and genetic diversity. Genetic diversity, defined as the variation in genetic resources within and between populations, is critical to the ability of wild steelhead to adapt to changing environmental conditions. Wild Fish Management Policy rules were established to guide the management and conservation of genetic resources of indigenous wild fish in Oregon. OAR 635-07-527 -- Operating principles for Wild Fish Management acknowledges that "*The operating principles developed to implement this policy are associated with varying levels of uncertainty.*" Where there is uncertainty about management of wild steelhead populations, this plan will take a conservative approach. Therefore, some wild steelhead populations will be managed as genetic reserves free from the influence of hatchery fish. Ideally, these reserve populations would be distributed among all gene conservation groups, however practical application may be difficult where a gene conservation group is comprised of a single population.

Currently, the Department has delineated 22 populations of summer steelhead and 119 winter steelhead populations. Of these, 10 (45%) of the summer steelhead populations and 88 (74%) of the winter steelhead populations are not supplemented with hatchery fish (*See* Appendix B). Many of the unstocked populations occur in smaller drainages. Significant numbers of hatchery produced adults are believed to interbreed with many of these wild populations at levels greater than specified in Wild Fish Management

Policy Implementation Guidelines (See APPENDIX H). The long-term consequences of this interbreeding may be reduced fitness of wild populations. The Department believes that implementing strategies to bring populations supplemented with hatchery fish into compliance with Wild Fish Management Policy will also reduce the number of strays breeding with populations managed as wild. Wild Fish Management Policy implementation strategies include: (1) developing local hatchery brood stocks from wild fish, (2) increasing the proportion of wild fish in naturally spawning populations by adopting angling regulations prohibiting take of wild steelhead, (3) acclimating hatchery juveniles so that they return to where they are released, (4) trapping then disposing of excess hatchery adults (*See* APPENDIX D), and (5) reducing the number of hatchery fish released in some streams.

Objective 4. Protect wild populations of steelhead from detrimental interactions with hatchery fish.

Current actions

4.1 Basin plans will continue to include actions to bring management of all wild steelhead populations into compliance with the Wild Fish Management Policy.

4.2 The Commission has adopted strategies to bring coastal populations of steelhead into compliance with key provisions of the Wild Fish Management Policy. The strategies include developing additional brood stocks from indigenous populations, acclimating smolts to reduce straying, trapping and removing excess hatchery adults so that they do not spawn with wild fish, adopting angling regulations requiring the release of wild fish, and reducing or eliminating releases of hatchery smolts in some basins. ODFW will continue the process to develop WFMP compliance targeting NE Oregon populations next and then Willamette populations.

New actions

4.3 Develop agreement with Treaty Tribes on implementation of the Wild Fish Management Policy.

4.4 ODFW will develop new techniques and data sets to monitor the proportion of hatchery fish in naturally spawning populations where existing data is inadequate.

Monitor the Status of Wild Populations

Information on the status of most wild steelhead populations is generally inadequate to support biologically sound management (*See* APPENDIX B). Techniques currently used to monitor populations include counts of adults and juveniles through passage facilities at dams and falls, creel surveys, counts of adults at collection facilities and traps, counts of smolts at portable traps, spawning surveys, snorkel or electrofishing surveys of juveniles, and catch estimated from salmon/steelhead tags which was once the most widely used tool. Estimates from salmon/steelhead tags are less useful now that regulations requiring the release of nonfinclipped steelhead have been adopted for most streams and many anglers release all the fish they catch. It will be necessary to

develop census techniques or data sets for many populations where information is lacking.

Objective 5. Monitor the status of wild steelhead populations so that long term trends in populations can be determined.

Current actions

5.1 The Districts will continue to report annually on the status of wild steelhead populations at the annual stock status review.

5.2 The Natural Production Program will continue to prepare a biennial report on the status of wild fish in Oregon.

5.3 OAR 635-07-538 -- Implementation of the Wild Fish Gene Conservation Program (2) "The Department shall develop and implement a wild fish monitoring program. The purpose of the program is to provide systematic time series data collection and analysis that will be used to determine whether populations and gene conservation groups are coping with the evolutionary challenges posed by the dynamic environments in which they live. A report on the status of each gene conservation group shall be provided to the Commission every two years as part of the Wild Fish Management Policy biennial report."

New actions

5.4 ODFW will improve the accuracy and precision of estimates of retained and released fish from salmon-steelhead tags.

5.5 ODFW will develop new census techniques and data sets where existing data is inadequate to monitor trends in abundance of wild populations either as adults or juveniles.

5.6 Basin plans will establish a measure of abundance (either juveniles or adults) for wild steelhead populations that serves as a "red flag" such that if populations fall below this level or if the long term trend in abundance is downward, additional harvest constraints, increased efforts to restore habitat, changes in releases of hatchery fish or other appropriate actions will be taken.

Goal 2. Provide recreational, economic, cultural and aesthetic benefits from fishing and non-fishing uses of steelhead.

Steelhead currently provide sport fishing opportunities for the public as well as ceremonial, subsistence and commercial fisheries for the Treaty Tribes (*See* APPENDIX E and APPENDIX F). In 1974 Oregon voters designated steelhead as a game fish which precluded commercial fishing other than by the Treaty Tribes. Non-angling uses of steelhead not only provide recreation, but also broaden the base of support by the public for steelhead and habitat management programs.

Public workshops, angler surveys and other input from anglers have shown a desire for many kinds of steelhead angling opportunities. Providing an array of opportunities also increases the total amount of benefits provided. Geographic and aesthetic setting, type and difficulty of access, frequency of encounters with other people, and characteristics of steelhead populations such as age and season of return to freshwater, vary for steelhead fisheries throughout Oregon. The intent of ODFW is to provide for diverse steelhead angling experiences through this variation, along with gear, access or harvest restrictions desired by the public, and by increasing the abundance of steelhead above natural levels in some streams by releasing hatchery steelhead smolts. Opportunities to develop fisheries with an exceptionally high catch rate are constrained by limits on how much natural production ecosystems can support, concern about impacts of hatchery fish on wild fish and financial limits on hatchery production.

Most steelhead fisheries in Oregon are now supported by hatchery fish and hatcheries will continue to play an important role in managing steelhead in Oregon. Hatchery smolts are released not only to supplement fisheries, but as mitigation for developments such as hydroelectric and flood control projects, and to supplement natural production (See APPENDIX C).

Objective 6. Provide for a harvest by the Treaty Tribes without overharvesting wild fish.

Current actions

6.1 Tribal commercial, ceremonial and subsistence fisheries in the Columbia River will continue to be managed under the Columbia River Fish Management Plan.

6.2 The Tribes will establish their own seasons in the tributaries in conjunction with the Department.

New actions

No additional actions are planned.

Objective 7. Provide recreational angling opportunities reflecting the desires of the public while minimizing impacts on wild fish.

Current actions

7.1 ODFW will continue to provide an opportunity for the public to participate in the angling regulation and basin planning processes and thereby influence the types of angling experiences that are available.

New actions

7.2 Basin plans will establish quantifiable recreation objectives for streams open to steelhead angling (days of recreation, catch rate, catch, or harvest) reflecting the public's desires for steelhead angling opportunities. Basin plans will quantitatively show how the objective is to be attained through run size (either natural

production or releases of hatchery fish), catch rate and angling effort.

7.3 Work with the Tribes to establish non-tribal sport fishing opportunities on Tribal lands.

Objective 8. Increase non-angling uses of steelhead that provide recreation.

Current actions

8.1 ODFW will continue to develop additional non-angling opportunities involving steelhead at ODFW facilities, and through cooperative projects with other agencies and land managers. Potential projects include educational and interpretive displays at passage facilities, falls, hatcheries, and natural spawning and rearing habitat.

New actions

8.2 ODFW will provide information on opportunities for viewing steelhead to the public.

Goal 3. Involve the Public in Steelhead Management and Coordinate ODFW Actions with the Tribes and Other Agencies.

Conservation of Oregon's steelhead resource for present and future generations requires the cooperation and support of the public, Treaty Tribes, public and private habitat managers and ODFW. Exchange of information and ideas is essential if these entities are to work together to successfully implement this plan. Involving the public in steelhead management and providing non-fishing uses of steelhead will increase understanding and support by the public for steelhead and habitat management programs, increase ODFW's understanding of the public's desires, increase cooperation from both public and private habitat managers (landowners), and lead to sufficient financial support for effective steelhead management.

Objective 9. Increase awareness of issues facing steelhead management and ODFW's management programs.

Current actions

9.1 ODFW will continue to involve the public in activities such as habitat inventory projects, habitat alteration projects, hatchery hosts, preparing educational material, fish liberations, fin clipping, inventorying populations, spawning surveys, staffing acclimation and adult collection facilities, and rearing fish.

9.2 ODFW will continue to educate the public about steelhead management through STEP, Stream Scene, Salmon Watch and other similar programs, and by preparing news releases and other

materials to publicize management issues and programs for steelhead.

New actions

9.3 ODFW will distribute summaries on factors influencing survival of steelhead generated as a result of Objective 2 action 2.2 and Objective 3 action 3.4. of this plan.

9.4 ODFW will develop slide/tape presentations on steelhead management issues and programs.

9.5 Each biennium the Steelhead Program Leader will prepare a report summarizing progress on each action in this plan and attainment of the benchmarks, and develop an action plan detailing work to be completed by ODFW staff during the next biennium.

Objective 10. Provide a forum for public input on steelhead management.

Current actions

10.1 ODFW will continue to provide an opportunity for the public to participate in basin planning.

10.2 ODFW will continue to provide information to citizens interested in working with other government entities on issues concerning steelhead management.

10.3 ODFW will continue to provide an opportunity for the public to participate in the angling regulation process.

10.4 ODFW will continue to be available to individuals and groups to discuss their concerns about steelhead management

New actions

10.5 The Steelhead Plan will be revised six years after adoption by the commission. Public involvement will be part of the revision process.

Objective 11. Coordinate ODFW steelhead management activities with other habitat and fisheries managers.

Current actions

11.1 Continue ODFW participation in the Pacific Coast Steelhead Management Workshop and other technical meetings.

11.2 Continue coordinating habitat management, research, hatchery production and other fisheries management activities with the Treaty Tribes.

11.3 Continue to work with habitat protection agencies and land managers to protect and restore habitat (*See* Objective 1 actions 1.1 and 1.2).

New actions

No additional actions are planned.

BENCHMARKS

Benchmarks to measure progress in implementing this plan were established in three areas: basin planning, implementing the Wild Fish Management Policy and monitoring the status of wild populations..

Basin plans for all streams with steelhead except the mainstem Columbia will be completed by June 30, 1999.

Many of the actions in this plan will be implemented through basin plans including actions to:

- protect and restore habitat,
- establish minimum abundance goals for wild steelhead populations,
- bring management of all wild steelhead populations into compliance with the Wild Fish Management Policy,
- re-establish steelhead populations in habitat formerly occupied by steelhead, and
- establish quantifiable recreation objectives reflecting the public's desires for steelhead recreational opportunities.

Basin plans for streams supporting steelhead have been adopted for Willamette subbasins, Tenmile, North Umpqua, Yaquina, and Coos basins (*see* APPENDIX I). As these plans are revised, management direction provided by this plan will be incorporated. Basin plans for the remaining streams with steelhead except the mainstem Columbia are expected to be presented to the Commission for adoption by June 30, 1999, depending on the level of funding for planning. The mainstem Columbia is a conduit for migrating juvenile and adult steelhead from many rivers and states. Management of steelhead in these areas will continue to be coordinated through Columbia River Fish Management Plan (US v Oregon), Northwest Power Planning Council, Columbia Basin Fish and Wildlife Authority, and agreements between Oregon and Washington management agencies.

Actions to bring management of all wild steelhead populations into compliance with the Wild Fish Management Policy will be initiated by June 30, 1999, except for those populations specifically exempted by the Commission in accordance with OAR 635-07-528.

The intent of ODFW with regard to implementing the Wild Fish Management Policy is stated in OAR 635-07-526 (2) "*It is the policy of the Department to implement the Wild Fish Management Rules for all populations of wild fish except those populations specifically exempted by the Commission in accordance with OAR 635-07-528*" and in OAR 635-07-526 (3) "*It is recognized that management of some populations may not currently be fully consistent with these rules. However, it is the Department's long-term goal to bring these populations into compliance, with the exception of populations specifically exempted by the Commission in accordance with OAR 635-07-528.*" As basin plans are adopted by the Commission, they will continue to include actions to bring management of all wild steelhead populations into compliance with the Wild Fish Management Policy. The Commission has already adopted strategies to bring coastal populations of steelhead into compliance with key provisions of the Wild Fish Management Policy. Significant progress will be made in implementing these strategies in 1995 including developing new hatchery brood stocks from indigenous populations on the Siletz and Siuslaw rivers, reducing the number of smolts released in

the Nehalem, Wilson, Siletz, Yaquina, Siuslaw, Smith, Tenmile Creek and Coquille basins and eliminating smolt releases in the lower Nehalem, Tillamook, Miami, Little Nestucca, Salmon and North Fork Siuslaw rivers. Adopting strategies will continue by next targeting NE Oregon populations and then Willamette Basin populations. Many actions can be absorbed into existing budgets, but fully implementing these strategies may require additional funding or reductions in hatchery programs.

Census techniques and data sets will be developed that allow us to document the status of wild populations by June 30, 1999. Information on populations will include spawning escapement, proportion of hatchery fish in the spawning population, and a measure of abundance (either adults or juveniles) so that long term trends in populations can be monitored.

Steelhead populations vary in abundance from year to year for many reasons. Variation results from changes in the physical environment and interactions with other populations of the same or different species. Information on the status of most wild steelhead populations is generally inadequate to support biologically sound management (*See* APPENDIX B). Techniques currently used to monitor populations include counts of adults and juveniles through passage facilities at dams and falls, creel surveys, counts of adults at collection facilities and traps, counts of smolts at portable traps, spawning surveys, snorkel or electrofishing surveys of juveniles, and catch estimated from salmon/steelhead tags which was once the most widely used tool. As regulations requiring the release of nonfinclipped steelhead are adopted for more streams and more anglers release all of the fish they catch, estimates from salmon/steelhead tags are becoming less useful because estimates of the number of steelhead released are not reliable. Populations will continue to be monitored for existing data bases but emphasis has been placed on developing new data bases where information is lacking. It will be necessary to develop census techniques or data sets for many populations. New approaches, such as a portable camera counter/fish crowder, will be explored as they are developed.

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APPENDIX A

Life History

Steelhead trout is the anadromous form of *Oncorhynchus mykiss*. The non-anadromous form of *Oncorhynchus mykiss* is commonly referred to as rainbow trout. ODFW uses the subspecies and range designations for *O. mykiss* proposed by Behnke (1992) pending formal description of subspecies taxonomy. Oregon has three *O. mykiss* subspecies: Coastal steelhead/rainbow (*O. m. irideus*), Inland Columbia Basin steelhead/redband (*O. m. gairdneri*), and Oregon Basin Redband (*O. m. newberrii*).

Steelhead are endemic to the Northern Pacific Ocean and coastal drainages of North America and Asia. In North America, steelhead are found in freshwater from the north side of the Alaska Peninsula and Unimak Island south to Santa Monica, California (Burgner et al. 1992, Pauley et al. 1986). Since steelhead return for the most part to their natal stream, they occur as many populations with each population interbreeding with other populations only at relatively low levels. This allows each population to adapt to its particular habitat.

Steelhead are classified as either "summer run" or "winter run" depending on when the adults return to freshwater. Winter steelhead enter freshwater in late fall through spring and spawn shortly thereafter. Summer steelhead enter freshwater from spring through early fall and do not spawn until the spring of the following year. Summer steelhead in the Columbia River above Bonneville Dam are further classified as "A" or "B". The "B" run steelhead migrate to certain Snake River subbasins in Idaho and tend to be larger, older and migrate past Bonneville Dam primarily from late August through October. All Oregon populations are "A" run which migrate past Bonneville Dam primarily from June until late August

Coastal steelhead/rainbow occupy all major Oregon coastal basins and Columbia River tributaries up to and includung the winter steelhead population in the Hood River (Schreck et al., 1986). *O. m. irideus* includes a wide variety of life-histories including steelhead with various adult run-times, steelhead juveniles with various freshwater residencies, and resident rainbow trout. Populations with different adult life histories rarely occupy the same stream reaches in Oregon with exceptions in larger basins such as the Rogue, Umpqua, Hood, Sandy and Willamette. Most *O. m. irideus* below barriers have a winter steelhead life history while resident rainbow trout are most often found above anadromous fish barriers.

ODFW recognizes 119 populations of coastal steelhead (*O. m. irideus)*, 113 of which are winter-run. Summer steelhead are indigenous to the Hood, Rogue, Umpqua and Siletz rivers. They have been introduced into the Sandy, some Willamette tributaries, Nestucca and several streams entering Tillamook Bay. Gene conservation groups for *O. m. irideus* are poorly described due to inadequate information. The following provisional groups of steelhead are evident with existing data:

- Lower Columbia - Twenty-four winter-run and one summer-run population.
- Willamette above Willamette Falls - Nine winter-run populations.
- North to Mid Coast/Umpqua - Sixty-four winter-run and two summer-run populations.
- South Coast/Lower Rogue - Ten winter-run populations.

- Rogue River above Rogue River Canyon - Three winter-run and three summer-run populations.

Inland Columbia Basin steelhead/redband (*O. m. gairdneri)* occur in all Oregon subbasins of the Columbia River upstream of Mosier Creek between Hood River and the Dalles, including the Snake basin. Inland steelhead are extinct in the Snake basin above the Hells Canyon Dam and in the Deschutes subbasin above the Pelton Dam. Most Oregon inland steelhead are summer steelhead, with the exception of four winter-run populations along the western boundary of the subspecies (Schreck et al. 1986). All steelhead populations in this subspecies coexist with redband trout populations. The two life histories form different breeding populations because fish tend to choose mates of their own type, however, the populations are not reproductively isolated from each other (for example, Currens 1987). ODFW currently recognizes 18 *O. m. gairdneri* steelhead populations in three provisional gene conservation groups:

- Mid-Columbia - Four winter-run and seven summer-run populations.
- South Fork John Day - One summer-run population.
- Lower Snake - six summer-run populations.

Spawning and initial rearing of juvenile steelhead generally take place in moderate-gradient (generally 3-5%) streams. Females dig redds and deposit 1,500 to 6,000 eggs in pea to orange size gravel. Steelhead can spawn more than once, although the numbers in Oregon that survive to make another spawning migration are quite low, 3-10% in coastal streams and near zero for inland areas. Those that survive to spawn again are mostly females. Males usually arrive first on the spawning grounds and stay longer, and as a result are in poor shape to return to saltwater.

The eggs hatch in about 35-50 days, depending upon water temperature. The alevins remain in the gravel 2-3 weeks until the yolk sac is absorbed and then emerge as fry in late spring and begin to actively feed. Egg to fry survival is usually in the order of 15%.

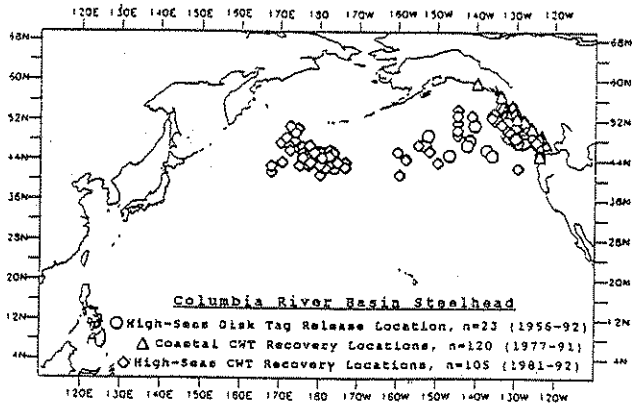
Productive steelhead habitat is characterized by complexity, primarily in the form of large and small wood or boulders and bedrock. Juveniles will take advantage of microhabitats to seek refuge from high water velocity and/or temperatures. Juveniles may move around in a basin to take advantage of favorable habitats. Fry prefer protected and complex edge habitat with low velocity (<0.3 ft/s). They are seldom observed in water over 15 inches deep. Summer rearing takes place primarily in the faster parts of small and deep scour pools with some form of surface cover and wood or medium to large substrate (cobble or boulders), plunge pools with a "bubble curtain" or undercut area behind the obstruction causing the plunge and pocket water in deeper riffles and rapids with wood and cobble or boulder substrate (especially 2 - 3 inches juveniles). Winter rearing occurs more uniformly at lower densities across a wide range of fast and slow habitat types. Small tributaries and lakes are probably important over winter habitat. As juveniles get older, some tend to move downstream to rear in larger tributaries and mainstem rivers.

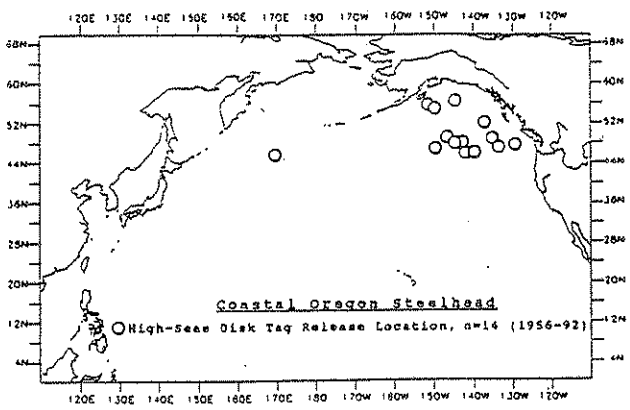
Wild steelhead remain in freshwater for 1 to 4 years (in Oregon the majority for 2 years) before undergoing physiological changes and migrating to the ocean as 6-8 inch long smolts in April, May and June. Egg to smolt survival for wild steelhead is typically in the range of 0.5-1.5%. Hatchery produced steelhead generally reach smolt size in 1 year although 2 years is required for some late spawning stocks. Survival of eggs to smolts in a hatchery is about 70-90%. The survival of wild smolts to returning adults generally ranges from 2-15% which is in the order of twice that of comparable hatchery smolts.

Compared with freshwater environments, understanding of the ecology of salmonids in the ocean environment is extremely scant. We do know that the ocean has a significant effect on abundance of adult steelhead from year to year. The annual abundance of steelhead populations in streams over a wide geographic along the Pacific Coast tends to track up and down at the same time.

A general picture of ocean distribution of steelhead from the Columbia River, north coast tributaries, and mid coast tributaries is that the juveniles tend to migrate directly offshore during their first summer from whatever point they enter the ocean rather than migrating along the coast as do salmon. By July most are in the Gulf of Alaska. Burgner et al. (1992) described the distribution of North American steelhead in the Pacific as north of between 40° N and 44° with the greatest concentrations from 42° N to 52° N. and west to 155° W (Appendix Figure A1). The range probably extends to 155° E with one tag recovered as far west as 163°32'E. During fall and winter, juveniles move southward and eastward. No steelhead have been found in the Bering Sea. Information on migration patterns and distribution in the Pacific Ocean is largely unknown for steelhead from south coast tributaries although there is some evidence that these fish move to an area off Northern California.

Steelhead usually remain in the ocean 1-3 years, until they return to freshwater to spawn as 20-30+ inch adults weighing 5 to 15 pounds. Some steelhead from the Rogue River, and the Eel and Klamath rivers in California return to freshwater after 3-4 months in the ocean as immature "half-pounders" at a length of 11-17 inches. They also stray into other southern Oregon coast streams, but do not spawn there. After spending the winter in the river without spawning, they return to the ocean to complete rearing before reascending the river on a spawning migration as either summer run or winter run adults.





Appendix Figure A1. Ocean distribution of steelhead from streams on the Oregon coast and the Columbia River (Burgner et al. 1992 updated by Katherine W. Myers, Fisheries Research Institute).

APPENDIX B

Status of Wild Populations

Many environmental conditions that influence survival at some point in the life cycle are potentially limiting factors for production of steelhead. Much of the freshwater habitat of steelhead has been extensively affected by human activities such as stream alterations, logging, mining, gravel removal, agriculture, grazing, roads, pollution, dams and water diversions. These activities can reduce water quantity and quality, decrease instream structural complexity, or form migration barriers, all of which may limit production of steelhead. Given the current state of human intervention in Pacific Northwest ecosystems, potential production of wild salmonids cannot be equated to historical production in most areas.

The Natural Production Program of ODFW prepares a biennial report on the status of wild fish in Oregon. Much of the following was excerpted from the 1994 biennial report. Updates may be obtained from the ODFW Portland Office as they become available. Status of each population is presented in Appendix Table B1.

Coastal Steelhead *(O. mykiss irideus)*

The ranges of some steelhead populations in the Willamette, Rogue and Umpqua rivers have decreased due to blockages caused by dam construction. The summer steelhead that historically traveled up the Klamath River to the area around Klamath Lake in Oregon became extinct in 1917 due to the construction of Copco Dam. Behnke (1992) places these fish in the coastal subspecies.

All coastal *O. mykiss* steelhead abundance estimates are currently low relative to estimates in the early 1970s. Ocean conditions may be partly responsible and some declines may be just a brief down-swing in a long-term abundance cycle. However local factors, including habitat alterations, species introductions, and hatchery programs, are affecting certain populations.

Steelhead abundance estimates in the Lower Columbia group are monitored by ladder counts at North Fork (Clackamas River), Marmot (Sandy River) and Powerdale (Hood River) dams. The Sandy River population has been stable but the Clackamas River population has declined about 20% since the early 1970s. Counts for both populations still exceed 1,000 adults annually. The Hood River populations are smaller. Many hatchery fish of several species, including summer and winter steelhead and domestic rainbow from other locations, have been released in the lower Columbia.

The combined abundance of the nine steelhead populations above Willamette Falls has been monitored at the ladder since 1971. Abundance estimates in 1991 and 1992 were the lowest since the counts began. However, population declines may have occurred previously because water quality in the Willamette River was very poor until the late 1960s due to urban and industrial pollution and low summer flows. Current habitat problems include stream channelization, urbanization, complete blockage by large dams and passage problems at small barriers. Hatchery winter and summer steelhead, domestic rainbow, sockeye, coho and fall chinook, from stocks outside of the Willamette, were introduced into the subbasin between the early 1900s and the 1960s. These fish may interbreed or compete with the native winter steelhead.

The steelhead population trends in the North to Mid-coast group vary. The summer steelhead population in the Siletz River and the 26 winter steelhead populations north of the Umpqua River to the Nestucca River are the most depressed *O. mykiss* populations on the Oregon coast.

Siletz Falls on the Siltez River was a natural natural barrier to migrating adult anadromous fish except summer steelhead. The falls was laddered in 1953 allowing passage of other species of anadromous fish. A Siletz summer steelhead hatchery program was started in the late 1950s. Most of the summer steelhead returning to the Siletz (over 95%) are hatchery fish. This indicates that the naturally spawning fish hatchery and wild fish are producing few adult offspring. The other species of anadromous fish now passing the falls may be out-competing the summer steelhead.

On the mid-coast an average of 65% to 80% of the adults returning to the stocked basins have been hatchery fish, based on scale samples from angler-caught fish. Adjacent unstocked populations have included as many as 40% hatchery strays. The wild fish populations along this section of the coast may be impacted by interbreeding with the hatchery fish, but in any case, the high proportions of hatchery fish indicates that naturally spawning fish are producing few adult offspring. Releases of Alsea River winter steelhead will be eliminated from some streams and local brood stocks developed in others so that by 1996, they will be released into 3 populations instead of the current 14.

Other coastal steelhead populations, including those in the Umpqua and along the north coast are stable to slightly declining but are all smaller than they were historically. The overall lower abundance is due to habitat problems caused by logging, road construction and stream channel alteration in the coast range and by effects of hatcheries and harvest. Hatchery programs in the Nehalem and south of Coos Bay are small and use local brood stocks. Angling regulations in 38 of the mid and north coast populations require the release of wild steelhead. There is no angling on the three remaining populations.

Populations in the Rogue basin have been affected by irrigation withdrawals, urbanization and logging which have modified flows, habitat availability, and water quality. Impacts were particularly serious during drought conditions in 1991 and 1992. The Rogue summer steelhead populations in the upper basin and the Illinois winter steelhead in the lower basin have sharply declined since the mid 1980s. A petition to list the Illinois winter steelhead population under the federal Endangered Species Act was denied in 1993 because the population did not constitute a listable unit under National Marine Fisheries Service policy (Department of Commerce 1993). However, the NMFS initiated a status review of steelhead in California, Oregon, and Washington. This review should be completed in the spring of 1995. Other populations in the two south coast gene conservation groups are stable or only slightly declining, although some are smaller than historical levels. Hatchery programs are present in the upper Rogue and in the Chetco on the south coast. Straying of hatchery fish into most wild populations along the southern Oregon coast is believed to be low.

Inland Columbia Basin Steelhead *(O. mykiss gairdneri)*

An aggregate abundance of all inland steelhead is measured at Bonneville Dam. Steelhead populations in specific basins are monitored by dam or weir counts in the Umatilla, Walla Walla and Deschutes basins, and by spawning ground counts in other basins.

Steelhead population trends demonstrated with data collected by different methods are comparable. The aggregated group increased in abundance during the 1980s. Now that all hatchery fish are marked it appears that although wild run increased considerably over the level of runs in the late 1970s, much of this increase in the total run was due to increasing hatchery production. The 1993 run at Bonneville was the lowest since wild and hatchery fish were differentiated in 1984. While all Oregon inland steelhead populations are above 300 fish, none are consistently meeting escapement goals.

Inland steelhead are impacted by subbasin habitat problems including cattle grazing, timber harvest, irrigation withdrawals, and passage barriers. These activities remove riparian vegetation, channelize streams, lower stream flows, block migrations and increase summer water temperatures. Steelhead are also impacted by mainstem Columbia hydropower dams. Populations in the Snake Basin cross eight dams while those in the mid Columbia cross one to four dams. Inland steelhead populations are affected by mixed-stock gill-net fisheries in the Columbia River. Sport angling has only a minor impact as regulations in most areas require the release of nonfinclipped (wild) fish.

Hatchery programs for inland steelhead exist in the Deschutes, Umatilla, Walla Walla, Grande Ronde and Imnaha basins. These programs generally use local broodstock and smolts are acclimated prior to release.

Appendix Table B1. Status of wild steelhead populations in Oregon.

Population	Estimated annual run	Percent wild[a]	Smolts released[b]	Race/ stock[c]	Comments
Summer Steelhead					
Hood R.	1,500	20	80,000 40,000	S/24 W/50	Run > 300 fish (from punchcard data); Know majority are hatchery fish.
Deschutes R.	11,000	50	162,000	S/66	33% strays from other basins not included in estimated run size, not all spawn in Deschutes
John Day below S Fk.	4,115				Average for last five years. Includes above and below South Fork.
N. Fk. John Day R.	2,800				Average for last five years.
M. Fk. John Day R.	2,350				Average for last five years.
S. Fk. John Day R.	675				Average for last five years.
John Day above S. Fk.	4,115				Average for last five years. Includes above and below South Fork.
Umatilla R.	2,000	65-75%	150,000	S/91	Brood stock has usually been more than 50% wild.
Walla Walla R.	400-800	>95%			WA Dept. Fish and Wildlife releases acclimated smolts in Touchet River at Dayton and direct stream releases in mainstem Walla Walla (RM 23-35).
Snake R.	>1,000		1,000,000	S/97	
Grande Ronde below RM 81.5	>1,000				
Joseph Cr.	>300				No hatchery fish recovered during spawning surveys; redds/mi = > 300 fish.
Wenaha R.	>300				
Wallowa R.	>1,000		1,087,000	S/56	
Minam R.	>300				
Above RM 81.5	>1,000		262,000	S/56	Some spawning surveys in upper Grande Ronde streams.
Imnaha R.	>500	>70%	330,000	S/29	Genetically similar hatchery fish.

Appendix Table B1 (continued)

Population	Estimated annual run	Percent wild[a]	Smolts released[b]	Race/ stock[c]	Comments
Siletz R.			80,000 70,000	S/33 W/33	>50% hatchery w/wild infusion.
N. Umpqua R.	9,300	38%	168,000	S/55	100% wild broodstock.
Rogue-Spring Run	2,300	60%	220,000 170,000	S/52 W/52	Run size is average dam count 1969-1991.
Rogue-Fall Run	130,000	60%			Average return 1976-1991. Includes half-pounders
Applegate R.			170,000	W/62	
Winter Steelhead					
Fifteenmile Cr.					
Threemile Cr.					
Mill Cr.					
Chenowith Cr.					
Mosier Cr.					
Hood R.	750	<60%	80,000 40,000	S/24 W/50	1991-94 dam counts
Lindsay Cr.					
Herman Cr.					
Eagle Cr.					
Tanner Cr.	>300	<70%			
Sandy R.			75,000 30,000 200,000	S/24 W/20 W/13	Pop. estimate. based upon punchcard data;
Clackamas R.		30%	135,000 125,000 230,000 40,000	S/24 W/13 W/20 W/122,	
Abernathy Cr.					
Tualatin R.			30,000	W/13	

Appendix Table B1 (continued)

Population	Estimated annual run	Percent wild[a]	Smolts released[b]	Race/ stock[c]	Comments
Molalla R.			65,000 31,250	S/24 W/13	92 & 93: In Pudding system, examined 259; 1 hatchery summer. In Molalla examined 23, no hatchery marked.
Yamhill R.					
Rickreall Cr.					
Luckiamute R.					
NF Santiam			165,000 100,000	S/24 W/21	At Stayton1993 & 94 examined 649, 13% hatchery (2% stray)
SF Santiam			144,000	S/24	No H releases since 1986; 10% hatch fish in trap: 1992
Calapooia R.					
Mary's R.					
Scappoose Cr.			10,000	W/13	
McBride Cr.					
Milton Cr.					
Tide Cr.					Barrier falls located 0.5 miles above the mouth; rearing habitat limited, unlikely to produce 300 adults.
Goble Cr.					
Fox Cr.					Very small drainage, steelhead potential unknown but most likely < 300.
Nice Cr.					Very small drainage, steelhead potential unknown but most likely < 300.
Clatskanie R.			10,000	W/13	Pop. estimate. based upon punchcard data >300; 1983-91 percent hatchery fish = 82% based upon scale analysis
Plympton Cr.					
Gnat Cr.			40,000	W/13	Pop. estimate. based upon punchcard data >300; 1991 spawning surveys revealed a few wild fish..
Fertile Valley Cr.					Extinct?
Big Cr.			60,000	W/13	Pop. estimate. based upon punchcard data >300. Extinct?
Bear Cr.					1991 spawning surveys conducted to locate wild steelhead did not verify any fish in this stream. Extinct?
N Fk. Klaskanine			60,000	W/13	Pop. estimate. based upon punchcard data >300; 1983-91 average percent hatchery fish = 55% (scale analysis).
S Fk. Klaskanine					Pop. estimate. based upon punchcard data >300; 1983-91 average percent hatchery fish = 55% (scale analysis).

Appendix Table B1 (continued)

Population	Estimated annual run	Percent wild[a]	Smolts released[b]	Race/ stock[c]	Comments
Lewis & Clark R.					Pop. estimate. based upon punchcard data >300; 1983-91 average percent hatchery fish=50% (scale analysis).
Necanicum R.	>3000		40,000	W/32	based upon punchcard data even though most are hatchery fish.
Indian Cr.					Probably > 10% hatchery strays, but direct data lacking. Drainage probably cannot support 300 fish.
Canyon Cr.					Probably > 10% hatch. strays, but direct data lacking. Drainage probably cannot support 300 fish.
Elk Cr.			X		probably less than 300 fish
Asbury Cr.					Probably > 10% hatch. strays, but direct data lacking. Drainage probably cannot support 300 fish.
Arch Cape Cr.					Probably > 10% hatch. strays, but direct data lacking. Drainage probably cannot support 300 fish.
Short Sands Cr.					Probably > 10% hatch. strays, but direct data lacking. Drainage probably cannot support 300 fish.
Nehalem R. below Hwy 26					
N FK. Nehalem R.			50,000 40,000	W/32 W/99	
Above Hwy 26					
Watseco Cr.					
Lagler Cr.					Probably greater than 10% hatchery strays.
Miami R.					
Electric Cr.					Probably greater than 10% hatchery strays.
Patterson Cr.					Probably greater than 10% hatchery strays.
Jacoby Cr.					Probably greater than 10% hatchery strays.
Doty Cr.					Probably greater than 10% hatchery strays.
Vaughn Cr.					Probably greater than 10% hatchery strays.
Kilchis R.			40,000	W/47	
Wilson R.			50,000 100,000	S/33 W/47	1991-92 R&D creel data = 63% H of which only 1% were strays (from Nestucca)
Trask R.			X		
Tillamook R.					

Appendix Table B1 (continued)

Population	Estimated annual run	Percent wild[a]	Smolts released[b]	Race/ stock[c]	Comments
Whiskey Cr.					Probably greater than 10% hatchery strays.
Sand Cr.					Probably greater than 10% hatchery strays.
Nestucca R.			70,000 110,000	S/33 W/47	H = 70% in fishery for Nestucca, 65 % for 3 rivers of which 9% and 2%, respectively were strays (R&D 91-92 creel data)
L. Nestucca R.					Average 85% hatchery fish based upon scale analysis.
Neskowin Cr.					Probably <300 fish; > 10% H. strays likely.
Salmon R.		16%			83-91 volunteer scale information.
Rock Cr.					Probably >10% H. strays
Siletz R.		25%	70,000 80,000	W/33 S/33	83-91 volunteer scale information.
Drift Cr.		32%			83-91 volunteer scale information.
Schooner Cr.					Probably > 10% strays
Yaquina R.			20,000	W/43	H = 12% in Mill Creek trap of which 72% from local releases., 28% strays from N. coast hatcheries (91-92 Lincoln District)
Thiel Cr.					Probably > 10% hatchery strays
Beaver Cr.					<300 fish; also > 10% H. strays likely.
Alsea R.			120,000	W/43	H = 68% in fishery of which 24% were strays from Alsea Hatchery outsystem releases (91-92 R&D creel data).
Drift Cr.					H = 56% at trap (all strays) of which 78% were outsystem Alsea releases, 0% from Alsea basin releases, and 22%
Big Cr.					Although no direct data, adjacent Yachats has > 10% H strays.
Yachats R.					41% hatchery strays in 1991
Cummins Cr.					Although no direct data, adjacent streams have > 10% H strays
Bob Cr.					Although no direct data, adjacent streams have > 10% H strays
Tenmile Cr.					27% hatchery strays in 1991; 620 fish in estimated run
Rock Cr.					Although no direct data, adjacent streams have > 10% H strays
Big Cr.					Assumed > 10% H strays; escapement estimate of 730 fish
Cape Cr.					14% hatchery strays in 1991; run size estimate = 470 fish
Sutton Cr.					Although no direct data adjacent streams have > 10% H strays

Appendix Table B1 (continued)

Population	Estimated annual run	Percent wild[a]	Smolts released[b]	Race/ stock[c]	Comments
Siuslaw R.			100,000	W/38	H = 57% of which 4% were strays from other hatcheries (91-92 R&D creel data)
NF Siuslaw R.					59-87% hatchery fish
Siltcoos R.					Although no direct data, adjacent streams have > 10% H strays.
Tahkenitch Cr.					Although no direct data, adjacent streams have > 10% H strays.
Umpqua R. below N. Fk.					
Smith R.			35,000	W/43	
N. Umpqua R.	7,200	90	168,000	S/55	Average 10% stray S. Umpqua stock reared at Rock Creek Hatchery.
S. Umpqua R.			88,000	W/18& W/55	
Tenmile Cr.		20	16,000	W/37	
Coos R.			120,000	W/37	
Millicoma R.	4,900				
Miner Cr.					
Big Cr.					
Whiskey Run Cr.					
Cut Cr.					
N + E. Fk. Coquille			43,000	W/44	
S + M. Fk. Coquille		45	60,000	W/44	
Johnson Cr.					
China Cr.					
Twomile Cr.					
Floras Cr.					% H strays average = 32% based upon scale analysis; punchcard est. suggests pop. > 300.
Sixes R.					9.8% H in fishery, all are from Rogue (91-92 R&D creel data);
Elk R.					8.6% H in fishery of which majority from Rogue (91-92 R&D creel data).
Brush Cr.					
Euchre Cr.					

Appendix Table B1 (continued)

Population	Estimated annual run	Percent wild[a]	Smolts released[b]	Race/ stock[c]	Comments
Rogue below Ill. R.	46,000	7%			Average return 1977-78 to 1979-80. 5-10% hatchery fish in fishery (assume 2% on spawning. ground. About 20% hatchery enter river.
Illinois R.					
Ill. R. to Gold Ray					assume > 300 fish based upon basin total
Applegate R.			170,000	W/62	
Above Gold Ray	11,000	19%	220,000 170,000	S/52 W/52	Average dam count 1979-1987
Thomas Cr.					
Hunter Cr.					
Pistol R.					
Chetco R.		61%	50,000	W/96	In fishery, 28% are strays from the Rogue (1991-92 creel survey data)
Winchuck R.					25-45% H strays (regional meeting notes)

a.Percent of run entering the river, not the naturally spawning population.

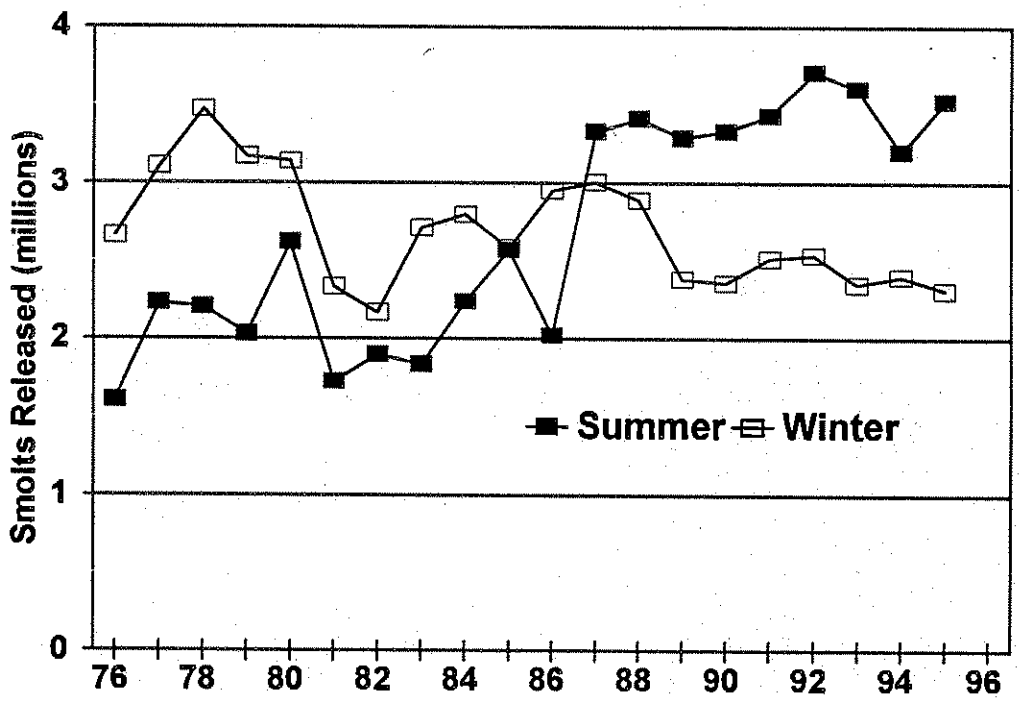
[b] 1995 smolt allocation.

[c] Race (W = winter and S = summer)/stock number (See Appendix Table C1).

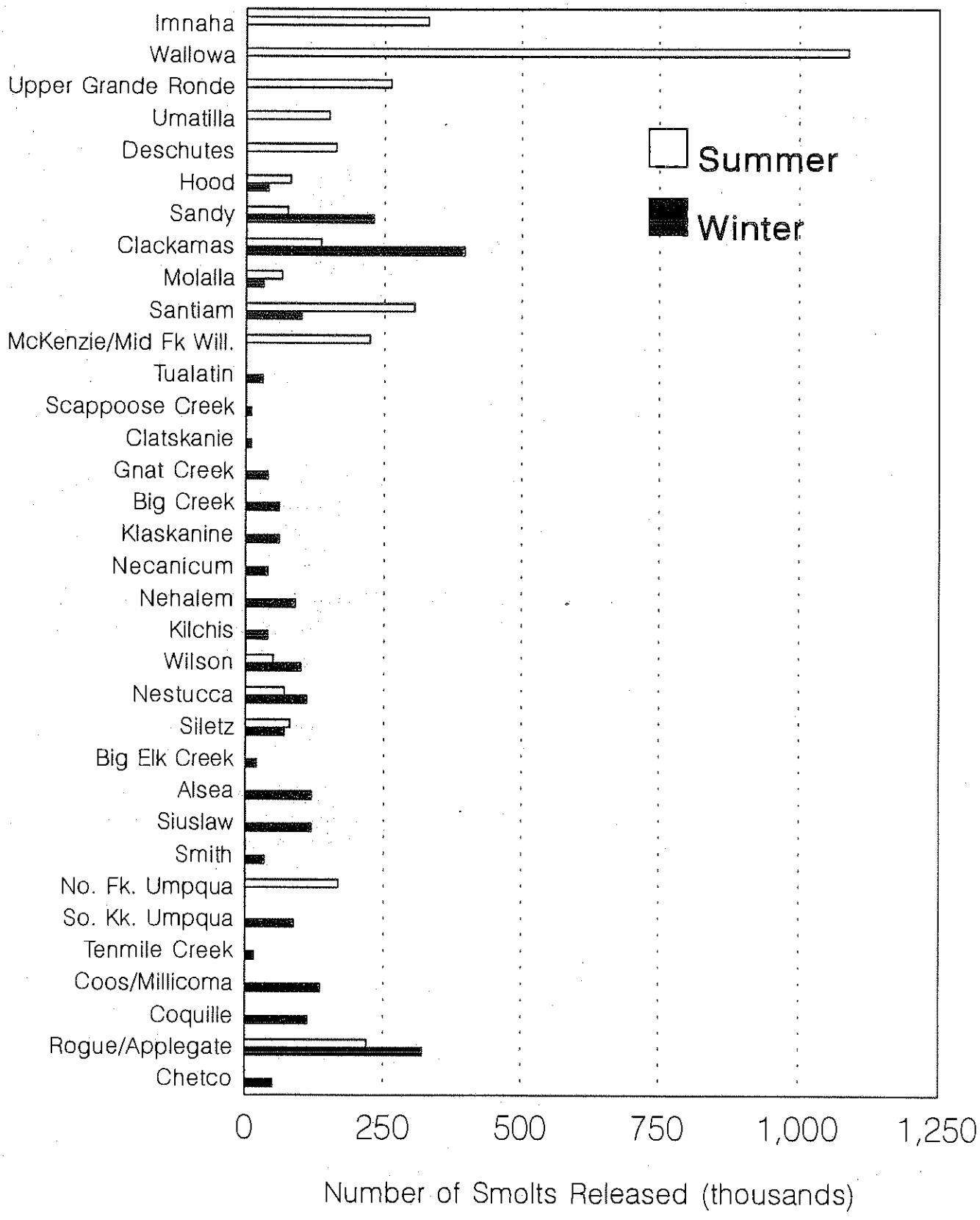
APPENDIX C

Hatchery Production

A total of 5,829,000 steelhead smolts, 3,520,000 summers and 2,308,000 winters, are planned for release in Oregon in 1995 (Appendix Figure C1). The number of hatchery produced steelhead smolts by river system to be released in 1995 is shown in Appendix Figure C2. These fish are produced at 24 hatcheries located throughout the state at a cost of about $2,800,000. The STEP program releases an additional 200,000 to 300,000 winter steelhead smolts annually. A variety of hatchery brood stocks are used and more are being developed as strategies for compliance with the Wild Fish Management Policy are implemented. A summary of steelhead brood stocks used in Oregon hatcheries is presented in Appendix Table C1.



Appendix Figure C1. Number of hatchery produced summer and winter steelhead smolts released in Oregon, 1976-1995.



Appendix Figure C2. Distribution of planned releases of winter and summer steelhead smolts, 1995

Appendix Table C1. Steelhead brood stocks used in Oregon hatcheries.

Name	Number	Origin and current use
Summer steelhead		
Deschutes	66	Originated from wild stock collected at the Pelton Trap in the mid 1960s. Released in the Deschutes River.
Imnaha	29	This stock is indigenous to the Imnaha River system and has been collected at Little Sheep Creek annually since 1982. Released in Imnaha system.
North Umpqua	55	Indigenous to the North Umpqua system. Since 1957, brood fish have been collected at Winchester Dam. Until 1984 both hatchery and wild fish were selected for brood. Since 1985, only wild fish have been used. Released in the North Umpqua.
McKenzie	23	The first eggs were taken in 1980 from South Santiam stock #24 adults returning to the McKenzie River. Used in the McKenzie and Middle Fork Willamette and as a backup source for stock 24 at South Santiam Hatchery.
Rogue	52	The original source was indigenous summer steelhead collected at Gold Ray Dam in 1962. Since 1974, only fish collected at Cole Rivers Hatchery have been used. Released in the Rogue basin.
Siletz	33	Indigenous to the Siletz River. Released in the Siletz and as a backup source for stock 33 at Cedar Creek.
Snake	97	Taken from steelhead returning to Hells Canyon Dam. IDF&G used stock #97 to establish the Pahsimeroi stock, and there has been frequent interchanges between Pahsimeroi and #97 stocks in recent years. Released in the Snake River at Hells Canyon Dam.
South Santiam	24	Originated from imports of 1967 - 1973 brood Skamania stock eggs from Skamania Hatchery on the Washougal River. Skamania brood stock is a mixture of fish from the Washougal and Klickitat rivers. Since 1974, nearly all eggs have come from adults returning to Foster Dam with a few collected at other Willamette Basin facilities. Used in the South Santiam, North Santiam, Molalla, Clackamas, Sandy and Hood, and as a backup source for stock 23 at Leaburg Hatchery.
Three Rivers	47	This stock is progeny of stock #33 that return to Cedar Creek Hatchery. Released in the Nestucca, Wilson and Kilchis.

Appendix Table C1(continued)

Name	Number	Origin and current use
Umatilla	91	Developed from adults collected at Three Mile Dam each year since 1980. Foreign stock introductions were made in the Umatilla Basin in the late 1960s when Snake stock #97 and Skamania stock from the Washougal River, Washington, were released. In addition, during the initial years of brood stock collection at Three Mile Dam, dorsal deformities were commonly observed on fish passing over the dam. Released in the Umatilla.
Wallowa	56	Best described as a conglomerate of Snake Basin stocks. Adult steelhead were collected at Snake River dams from the 1975-76 through 1977-78 runs, and spawned at Wallowa Hatchery. The intent was to select fish of typical Group A size. The 1979 brood was entirely from spawn taken at Pahsimeroi Ponds on the upper Salmon River in Idaho which originated from Snake stock # 97. Subsequent production at Wallowa has come entirely from fish returning to the hatchery, including wild Wallowa River stock which may have been influenced by introductions of Snake River stock #97 in 1971 and 1972 and Skamania stock in 1973 - 1975. Released in the Wallowa and Grande Ronde systems.
<u>Winter steelhead</u>		
Alsea	43	Developed from native Alsea fish in 1936. Only fish returning to the Alsea River have been used. Released in the Salmon, Siletz, Big Elk, Alsea, Siuslaw and Smith.
Applegate	62	Started from indigenous fish returning to Applegate Dam and a few Rogue stock #52 winters in 1979. Released in the Applegate.
Big Creek	13	Developed in the early 1940's from indigenous Big Creek fish. Records in the District office indicate that the first smolt releases were in 1961. Released in the Sandy, Clackamas, Tualatin, Molalla, Scappoose Creek, Clatskanie, Gnat Creek, Big Creek and Klaskanine.
Chetco	96	Steelhead returning to the Chetco River were used to develop the stock beginning in 1970. Alsea stock #43 were released into the Chetco for several years prior to 1970. Released in the Chetco.

Appendix Table C1(continued)

Name	Number	Origin and current use
Clackamas	19	A mixture created at Eagle Creek National Hatchery from indigenous Clackamas fish and Big Creek stock, crossed with Donaldson rainbow from the University of Washington. Although Alsea stock #43 was routinely released in the Clackamas in the 1960s and early 1970s it is believed that few if any returned as adults because of susceptibility to *Ceratomyxa shasta*. Released in the Clackamas.
Clackamas	20	A portion of the late (March-April) spawning at Eagle Creek National Hatchery has been shipped to ODFW's Clackamas Hatchery and is referred to as stock #20. Released in the Clackamas.
Clackamas	122	This broodstock has been collected since 1991 at North Fork Dam and consists of late returning indigenous fish. Released in the Clackamas.
Coos	37	Wild steelhead were collected in the Coos system by volunteers starting in 1983. Released in the Coos/Millicoma and Tenmile Creek.
Coquille	44	Wild adults were collected from the fishway on the North Fork Coquille beginning in 1983. In 1985, broodstock collection was expanded to include the East, Middle and South forks. Released in the North and East forks of the Coquille.
Coquille	144	Since 1990, wild adults have been collected from a trap near Powers and by netting in the upper South Fork basin. Released in the South Fork Coquille.
Fishhawk	99	This stock is indigenous to the upper Nehalem River Basin and is resistant to *Ceratomyxa shasta*. The stock was originally collected in 1981-83 at Fishhawk Lake Trap. The early portion of the adults that return to North Nehalem Hatchery provide brood stock.
Hood	50	Wild adults have been collected at Powerdale Dam since 1991. Brood is selected from throughout the run. Released in the Hood system.
Klaskanine	15	Returning adults from releases of Big Creek stock #13 are used as a back-up for stock #13.

Appendix Table C1(continued)

Name	Number	Origin and current use
North Nehalem	32	Developed at North Nehalem Hatchery from Big Creek stock #13 imported for one 3-year cycle from 1966-68. Subsequent production has been from returning adults, including wild fish that enter the hatchery. The stock is moderately resistant to *Ceratomyxa.* Released in the Nehalem and Necanicum.
North Santiam	21	Derived from indigenous winter steelhead. Cultured since at least the 1930s. Released in the North Santiam.
North Umpqua	55	Wild fish are collected at Winchester Dam and used by STEP in the North Umpqua system.
Rogue	52	Originated with eggs taken from indigenous upper Rogue River winter steelhead in 1974. Released in the Rogue River.
Siletz	33	A new brood stock will be started from wild adults beginning with the 1994-95 run year.
Siuslaw	38	Wild adults have been collected by angling and at temporary weirs at several locations in the Siuslaw and the resultant smolts released in the Siuslaw system.
South Umpqua	18	Wild fish are collected at Galesville Dam (Cow Creek and at South Umpqua Falls. Released in the South Umpqua.
Trask	34	Adult winter steelhead collected at East Fork Trask Pond provide a source of indigenous stock eggs for STEP projects in the Trask River system.
Three Rivers	47	This stock was developed in the late 1970s from returns of stock #43 adults to Cedar Creek Hatchery. Released in the Nestucca, Wilson and Kilchis.

APPENDIX D

Excess Adult Steelhead at Capture Facilities

Adult steelhead in excess of the number needed for brood stock often return to adult capture facilities. Excess adults can include both hatchery produced and wild fish. Opportunities to utilize excess adult steelhead will increase as more returning hatchery adults are captured and removed from the naturally spawning population as a strategy to comply with the Wild Fish Management Policy. ODFW recognizes that opportunities to utilize excess adult steelhead vary greatly among facilities depending on logistics such as personnel and transportation, wild fish concerns, and the quality and number of fish. The following is an inclusive list of options to consider when deciding how to manage excess adult steelhead. Many of these options will have only limited application or effect.

Prevent excess adults

1. If objectives for the hatchery program are regularly exceeded, reduce the number of hatchery juveniles released.

2. Liberalize angling regulations to harvest more hatchery fish.

   a) Open additional area to angling. If this would create snagging or other social problems, then the area could be opened on a limited entry basis (if such seasons are established by the Department) or only to those anglers who have a Blind Angling or Wheelchair Angling license, or a Walking Disability Permit (issued prior to 1988).

   b) Increase the bag limit. Removing weekly catch restrictions has been more widely accepted than increasing the daily limit.

   c) Lengthen the season.

   d) Allow additional usual methods of angling.

3. Provide better access to increase harvest of hatchery fish.

4. Publicize the fishery to increase harvest of hatchery fish.

Provide additional fishing opportunities

1. Recycle through the fishery.

2. Haul to a fishery on another stream.

3 Stock in lakes or ponds.

4. Supplement natural spawning within guidelines of the Wild Fish Management Policy.

Kill excess adults

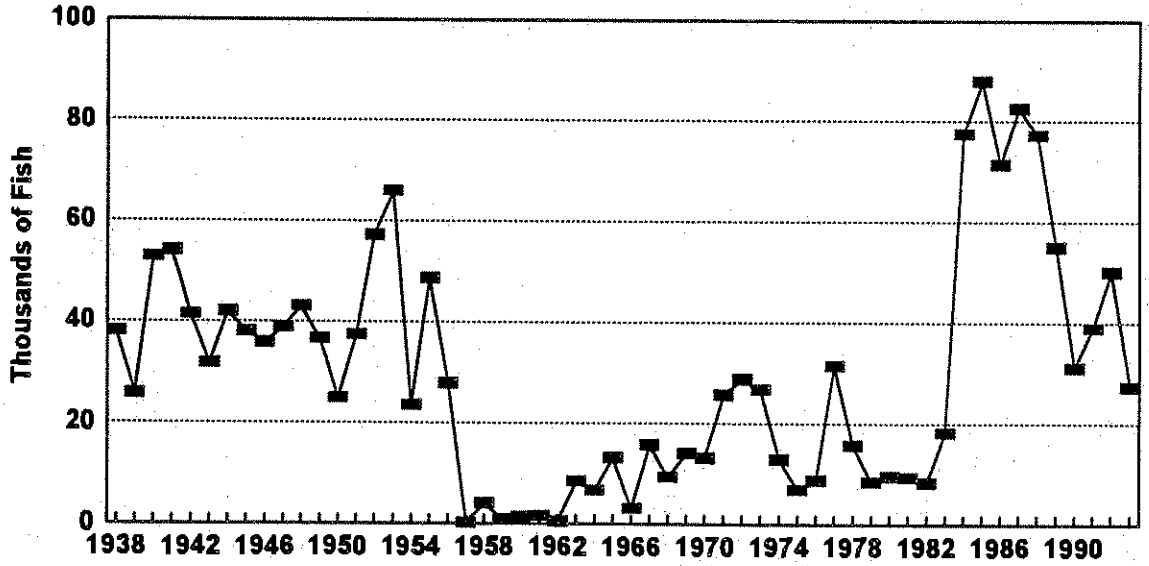
1. Provide to Treaty Tribes.
2. Give to charitable organizations as food.
3. Give to wildlife rehabilitators, zoos or educational programs.
4. Process into fish feed.
5. Bury or render the carcasses.
6. Return carcasses to a stream to provide nutrients.

APPENDIX E

Tribal Fisheries

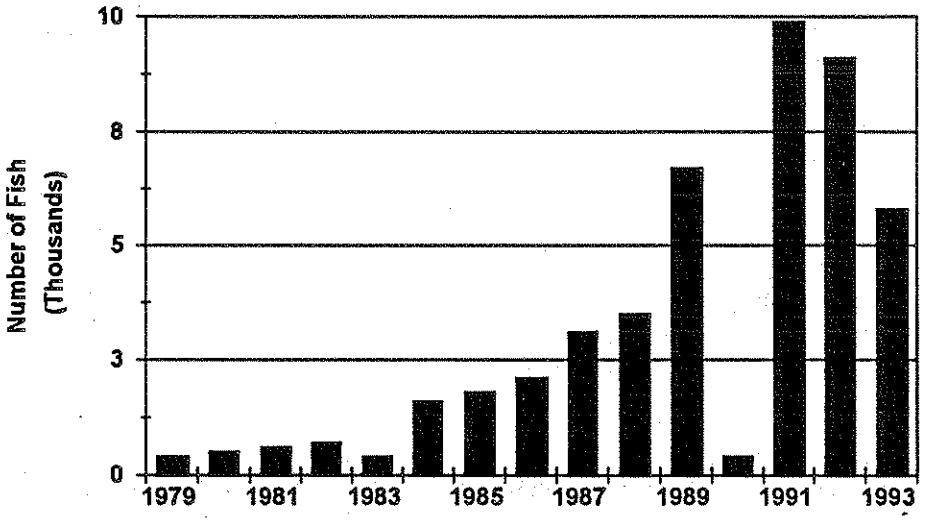
The commercial fishery above Bonneville Dam (Zone 6) was open to fishing by both tribal fishers and non-tribal fishers up to 1956. Harvest of summer steelhead ranged from 23,500 to 54,100 fish annually from 1938 to 1956 (Appendix Figure E1). A large tribal dip-net fishery at Celilo Falls accounted for the vast majority of the catch. The falls was inundated in 1957 by The Dalles Dam, ending the tribal fishery that had occurred for millennia. In 1957 joint action of the states of Oregon and Washington closed Zone 6 to commercial fishing. Treaty fisheries that occurred during 1957-68 were by tribal ordinances. In June 1968, the states reestablished commercial fishing exclusively for treaty fishers (Confederated Tribes of the Warm Springs Reservation of Oregon, Confederated Tribes of the Umatilla Indian Reservation, Nez Perce Tribe and the Yakama Indian Nation) in the main-stem Columbia River above Bonneville Dam. In 1994, the fishery was conducted mainly with set gill nets. Dip netting occurred from scaffolds erected primarily at Cascade Locks (above Bonneville Dam) and Lone Pine (below The Dalles Dam). Commercial harvest of summer steelhead by the Treaty Tribes after 1957 range from 200 to 86,300 annually (Appendix Figure E1). The harvest in the mainstem Columbia River fisheries includes fish produced in Idaho, Washington and Oregon.

Limited numbers of winter steelhead are harvested annually in tribal commercial fisheries during the February-March winter season. It is believed all of these are caught in the Bonneville Pool and only total several hundred fish.

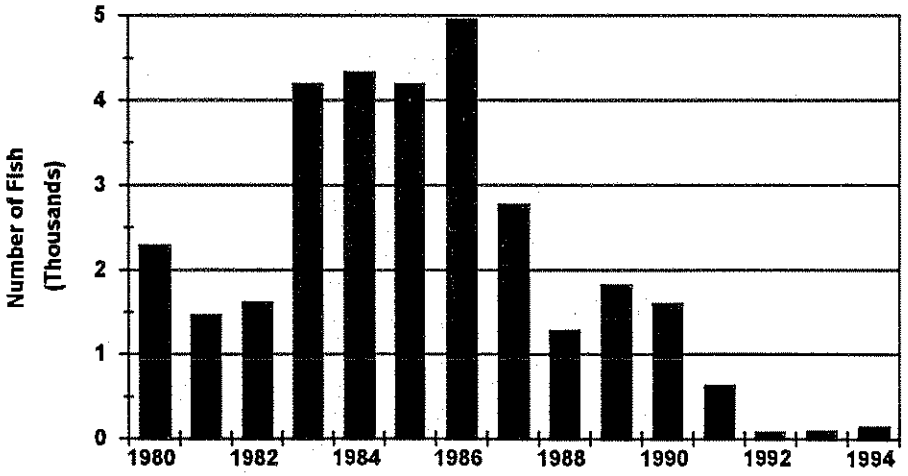


Appendix Figure E1. Number of steelhead caught in commercial fisheries above Bonneville Dam in the mainstem Columbia River.

Tribal fishers also catch anadromous fish in ceremonial and subsistence (C&S) fisheries. Ceremonial fishing is conducted by tribal permit primarily with set nets. Subsistence fishing is usually open year round and is conducted by individuals primarily with dip net and hook and line. Some tribal permits allow subsistence fishing with set nets. Monitoring and catch reporting of C&S fisheries are tribal responsibilities. Since 1979 reported harvest of summer steelhead in C&S fisheries have ranged between 400 and 9,900 fish (Appendix Figure E2). Additional C&S fisheries in tributary streams take up to several thousand summer steelhead in the Deschutes River (Appendix Figure E3), and lesser amounts in NE Oregon tributaries.



Appendix Figure E2. Number of summer steelhead harvested in ceremonial and subsistence fisheries in the mainstem Columbia River.



Appendix Figure E3. Number of summer steelhead harvested in ceremonial and subsistence fisheries in the Deschutes River.

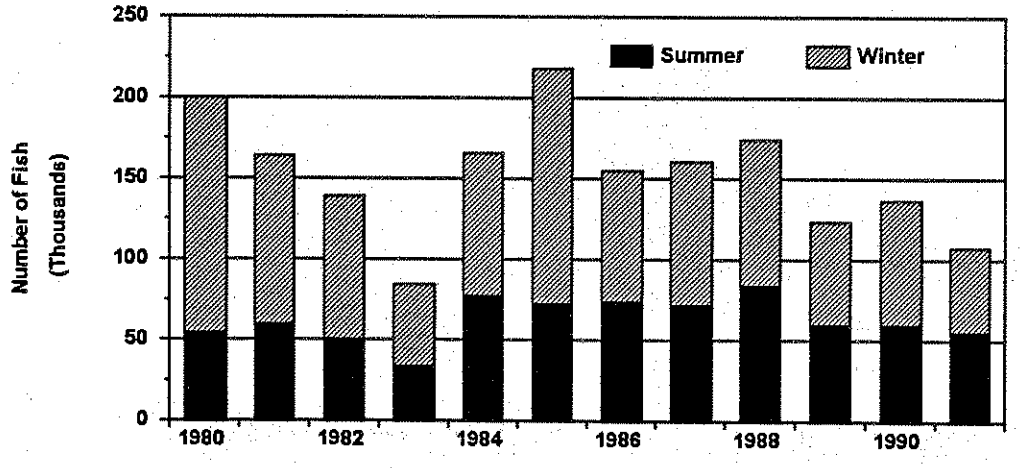
APPENDIX F

Sport Fisheries

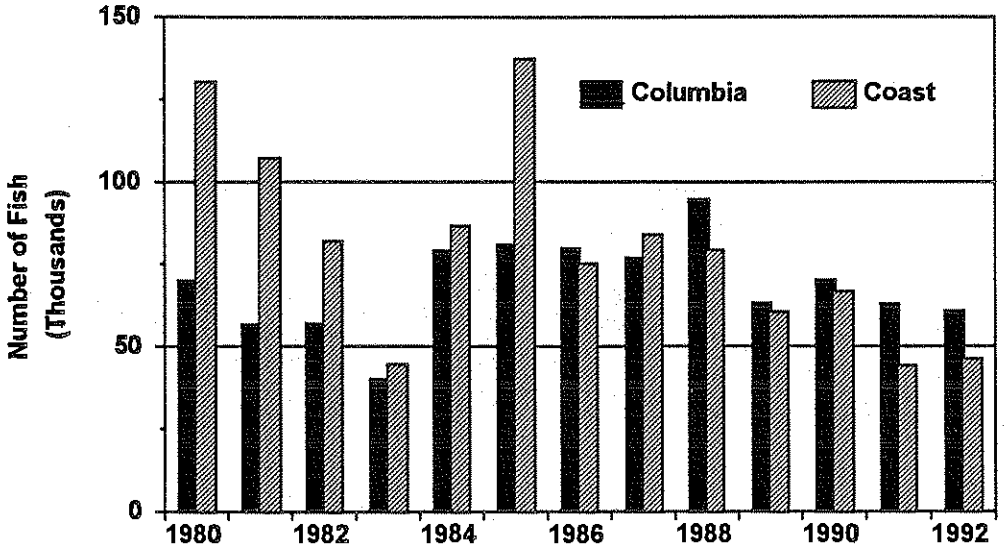
Steelhead support popular sport fisheries in Oregon. As of 1994, there are 4,865 miles of stream open to steelhead angling in Oregon (Appendix Table F2). Catch prior to 1960 was primarily wild fish. Now both the catch and harvest are primarlity hatchery fish. All hatchery produced smolts in the state are fin marked and regulations allow only hatchery (finclipped) steelhead be kept except in the Walla Walla, John Day and most streams in the southwest zone. We have no reliable method to estimate the number of steelhead caught and released. This has created a problem in tracking fisheries and run sizes as regulations requiring the release of nonfinclipped steelhead are adopted for more streams and more anglers release all of the fish they catch.

Since 1980 the annual sport harvest of adult steelhead in Oregon estimated from salmon/steelhead tags (data are available through 1992) has varied from about 84,000 to 204,000 per year (Appendix Figure F1). In addition to adult steelhead, thousands of half-pounder steelhead are also caught annually in the Rogue River. The number of winter steelhead harvested by sport anglers in coastal streams has declined in recent years to the point where the harvest is less than in the Columbia River (Appendix Figure F2).

A total of 465,121 $\pm$ 58,355 of days was estimated to have been spent angling in Oregon for adult steelhead in 1977 with an additional 35,721 $\pm$ 26,910 days angling for "half-pounders" for a total of 500,843 $\pm$ 64,261 (Lowry 1978). This was 9.5% of the total number of days spent angling. From September 1988 through August 1989 the number of days spent angling for steelhead was estimated to be 789,011 $\pm$ 62,862 which was 9.8% of the total number of days spent angling (The Research Group 1991). Distribution of angling effort for steelhead from September 1988 through August 1989 showed that the Willamette angling regulation zone supported more days of angling than any other area (Appendix Table F1).



Appendix Figure F1. Annual sport harvest of summer (1980-81 through 1991-92 run years) and winter steelhead (1979-80 through 1990-91 run years) in Oregon estimated from salmon/steelhead tags.



Appendix Figure F2. Annual harvest of adult steelhead in coastal streams and the Columbia system in Oregon estimated from salmon/steelhead tags, 1980-92.

Appendix Table F1. Location of angling effort for steelhead, September 1988 through August 1989 and average number of steelhead harvested per year for the 5 year period of 1986-87 through 1991-92 run years by angling regulation zone.

Angling zone	Number of days[a]			Percent of days	Number of steelhead[b]	Percent of catch
	Residents	Non-residents	Total			
Central	66,168	1,873	68,041	8.6	9,300	7.0
Columbia	47,536	4,148	51,684	6.6	10,951	8.3
Northeast	57,575	2,813	60,388	7.7	10,754	8.1
Northwest	171,871	4,541	176,412	22.4	31,164	23.5
Southwest	169,766	13,416	183,182	23.2	33,530	25.3
Willamette	248,237	1,067	249,304	31.6	36,709	27.7
Total	761,153	27,858	789,011		132,408	

[a]Source, The Research Group 1991.
[b]Average number harvested per year for the 5 year period of 1986-87 through 1991-92 run years as measured by expanding data from returned salmon/steelhead tags.

Appendix Table F2. Average number of steelhead harvested per year (1986-87 through 1991-92 run years as measured by expanding data from returned steelhead/salmon tags), and 1994 angling regulations for steelhead (does not include regulations for barbless hooks, size of hooks, or season). Information is summarized on the basis of statewide, angling zone and waterbody.

Waterbody	Miles open	Average harvest Winter[a]	Average harvest Summer[a]	Regulations
STATEWIDE	4,685	66,323	66,085	2 steelhead longer than 20 inches per day, 6 per week.
NORTHWEST ZONE	1,011	26,375	4,789	Release nonfinclipped steelhead.
Beaver Cr.	5	6	0	
Clatskanie R.	25	387	5	
Gnat Cr.	4	316	12	
Big Cr.	4	1,033	34	
Bear Cr.	2	12	0	
Klaskanine	2	397	0	
North Fork	2	576	0	
South Fork	10	166	0	
Youngs River	20	2	0	
Lewis and Clark R.	22	434	0	
Elk (Ecola) Cr.	2	13	0	
Necanicum R.	20	1,568	4	
Nehalem	117	1,103	17	
North Fork	20	1,709	24	Disabled anglers only area.
Salmonberry	13	56	0	
Cook Cr.	5	78	0	
Rock Cr.	15	37	0	
Tillamook Bay		20	39	
Miami R.	11	277	0	
Kilchis R.	14	447	93	
Wilson R.	33	2,947	833	
Little N. Fk.	9	18	0	
Trask	18	989	262	
North Fork	4	43	2	
South Fork	3	21	1	
Tillamook R.	17	178	1	
Sand L.		5	0	
Nestucca	39	3,156	1,817	
Little Nestucca	11	254	5	
Beaver Cr.	6	35	0	
Three Rivers	11	909	48	
Neskowin Cr.	8	0	0	Must release all steelhead.
Salmon R.	14	871	175	
Devils Lake		5	0	

Appendix Table F2 (continued)

Waterbody	Miles open	Average harvest Winter[a]	Average harvest Summer[a]	Regulations
NORTHWEST ZONE (continued)				
Siletz R.	72	2,156	1,272	
Schooner Cr.	4	8	0	
Drift Cr.	15	274	37	
Rock Cr.	5	8	0	
North Fork	4	112	81	Fly angling only May 28 - Oct. 31.
South Fork	4	58	21	
Yaquina R.	34	26	0	
Big Elk Cr.	21	344	0	
Beaver Cr.	4	14	0	
Alsea R.	43	2,133	4	No angling from a floating device above Mill Cr.
Drift Cr.	24	68	0	
Five R.	14	33	0	
Lobster Cr.	8	5	0	
Fall Cr.	5	26	0	
South Fork	9	133	0	No angling from a floating device
North Fork	5	484	2	No angling from a floating device
Yachats R.	9	57	0	
Cummins Cr.	6	3	0	
Tenmile Cr.	11	76	0	
Big Cr.	8	68	0	
Rock Cr.	5	1	0	
Cape Cr.	6	23	0	
Sutton Cr. & Lake	5	6	0	
Mercer L.		0	0	
Siuslaw R.	109	1,463	0	
North Fork	25	143	0	
Sweet Cr.	10	10	0	
Lake Cr.	14	514	0	
Deadwood Cr.	20	8	0	
Indian Cr.	21	22	0	
Woahink L.		4	0	
Siltcoos R. & Lake	3	27	0	
Tahkenitch Cr. & Lake	2	0	0	
CENTRAL ZONE	128	616	8,684	May keep only AD-clipped sthd.
Herman Cr.	1	14	52	
Eagle Cr.	2	54	50	
Hood R.	12	533	2,788	
West Fork	8	8	207	Fly angling only above RM 9.
East Fork	3	7	87	
Deschutes R.	100	0	5,500	No angling from a floating device Flies and lures only.
White R.	2	b	b	Flies and lures only.

Appendix Table F2 (continued)

Waterbody	Miles open	Average harvest Winter[a]	Average harvest Summer[a]	Regulations
SOUTHWEST ZONE	1,086	21,976	11,554	
Umpqua	112	2,864	474	
Smith R	85	571	0	Release nonfinclipped steelhead.
N. Fk. Smith R.	19	204	0	Release nonfinclipped steelhead.
Calapooya Cr.	15	b	b	
North Fork Umpqua	70	1,297	4,771	One nonfinclipped sthd per week. No angling from a floating device above RM 31. Single fly only above RM 35.7.
Little R.	7	d	d	
South Fork	88	878	0	
Cow Cr.	26	50	0	
Tenmile Cr. & Lake	5	327	0	Release nonfinclipped steelhead.
Eel L.	9	0		
Coos Bay & River	4	94	0	
South Fork Coos	31	463	0	
Tioga Cr.	6	6	0	
Milicoma R.	9	43	0	
East Fork	6	226	0	
West Fork	30	485	0	
Coquille Bay & River	35	702	0	Release nonfinclipped steelhead.
Middle Fork	24	132	0	Release nonfinclipped steelhead.
North Fork	33	757	0	Release nonfinclipped steelhead.
Middle Cr.	6	2	0	
South Fork	35	2161	0	Release nonfinclipped steelhead.
East Fork	14	415	0	Release nonfinclipped steelhead.
Fourmile Cr.	8	5	0	
Brush Cr.		12	0	
Floras Cr. & New R.	23	177	0	
Sixes R.	18	192	0	
Elk R.	15	288	0	
Euchre Cr.	13	19	0	
Rogue R. & Bay	157	6,290	5,949	Rainbow > 16 in are steelhead. Release nonfinclipped steelhead except > 24 inches in winter. Flies only up from Gold Ray Sept. 1 - Oct. 31.
Illinois R.	56	275	0	Flies and lures. Release all steelhead.
Applegate	45	885	360	Rainbow > 16 in are steelhead. Release nonfinclipped steelhead less than 24 inches. No angling from a floating device
Hunter Cr.	9	70	0	
Pistol R.	15	153	0	
Chetco R.	55	1733	0	
Winchuck R.	12	191	0	No angling from a floating device

Appendix Table F2 (continued)

Waterbody	Miles open	Average harvest Winter[a]	Average harvest Summer[a]	Regulations
WILLAMETTE ZONE	1,425	16,551	20,158	Release nonfinclipped steelhead.
Tanner Cr.	1	2	18	
Sandy	38	7,511	2,475	No angling from a floating device upstream from Oxbow Park
Bull Run R.	2	52	41	
Salmon R.	33	0	1,930	Upper 4 miles fly angling only.
Tribs	10	b	b	
Johnson Cr.	20	14	0	
Sucker Cr.	1	14	0	
Clackamas R.	95	3,937	5,597	
Clear Cr.	29	53	0	
Deep Cr.	9	27	0	
Eagle Cr.	12	1,047	0	
Abernathy Cr.	9	10	0	
Tualatin R.	77	22	0	
Gales Cr.	27	115	0	
Milton Cr.	18	26	0	
Scappoose Cr.	6	21	0	
North Fork	11	44	0	
South Fork	10	5	0	
Yamhill R.	11	1	0	
North Fork	32	14	0	
South Fork	61	2	0	
Willamina Cr.	20	34	0	
Mill Cr.	22	1	0	
Rickreall Cr.	24	53	0	
Luckiamute R.	55	7	0	
L. Luckiamute	13	b	b	
Mary's R.	40	10	0	
Long Tom R.	10	b	b	
Molalla R.	38	705	961	
Pudding R.	49	6	0	
Butte Cr.	19	28	0	
Abiqua Cr.	11	20	0	
Silver Cr.	6	7	0	
Mill Cr.	18	0	0	
Santiam	12	337	644	
North Fork	46	633	2,609	
Little N. Fk.	24	96	208	
South Fork	38	230	3,061	
Thomas Cr.	32	30	0	
Crabtree Cr.	30	21	4	
Wiley Cr.	13	b	b	
Calapooia R.	45	17	0	

Appendix Table F2 (continued)

Waterbody	Miles open	Average harvest Winter[a]	Average harvest Summer[a]	Regulations
WILLAMETTE ZONE (continued)				
McKenzie R.	82	0	1,654	Flies and lures in the lower 11 mi. July 15 - April 23 and in the upper 12 mi. May keep nonfinclipped steelhead.
Blue R.	2	b	b	May keep nonfinclipped steelhead.
South Fork	4	b	b	May keep nonfinclipped steelhead.
Willamette R.	187	1,374	733	
Coast Fork	30	0	0	
Row R.	7	b	b	
Middle Fork	17	24	206	
Fall Cr. & tribs	19	1	17	
NORTHEAST ZONE	723	0	10,754	May keep only AD-clipped sthd.
John Day Arm	10	0	547	
John Day R.	247	0	4,651	May keep any 2 sthd/day, 10/yr.
Middle Fork	24	0	117	May keep any 2 sthd/day, 10/yr.
North Fork	60	0	254	May keep any 2 sthd/day, 10/yr.
Umatilla R.	56	0	352	
Walla Walla R.	17	0	222	May keep any 1 sthd per day, 5 per year.
Snake R.	71	0	1,096	
Grande Ronde R.	141	0	1,729	
Wallowa R.	40	0	1535	
Wenaha R.	7	0	3	Must release all steelhead.
Catherine Cr.	27	b	b	
Imnaha R.	23	0	248	
COLUMBIA ZONE				
Columbia R.	312	805	10,146	May keep only AD-clipped sthd.

[a] Race.
[b] Open for steelhead angling but does not appear on the punchcard summaries for either summer or winter steelhead.

APPENDIX G

OAR 635 Division 07 -- Fish Management and Hatchery Operation, Portions Relevant to Management of Steelhead

635-07-501 -- Definitions

(1) "**Anadromous**" means fish which migrate from saltwater to freshwater for spawning.

(3) "**Aquatic habitat**" means the waters which support fish or other organisms which live in water and which includes the adjacent land area and vegetation (riparian habitat) that provides shade, food, and/or protection for those organisms.

(6) "**Brood stock**" means a group of fish, generally from the same population, that are held and eventually artificially spawned to provide a source of fertilized eggs for hatchery programs.

(8) "**Commission**" means the Oregon Fish and Wildlife Commission.

(10) "**Department**" means the Oregon Department of Fish and Wildlife.

(11) "**Depressed**" means below established goal such as a fish production or escapement goal shown in a management plan or below the level of production or escapement that the Commission determines to be an optimal level.

(13) "**Enhancement**" means management activities including rehabilitation and supplementation that increase fish production beyond the existing levels.

(16) "**Fry**" means fish which have recently hatched and have not fed.

(17) "**Foreign**" means fish which originate through human intervention from a different population.

(18) "**Gene conservation group**" means a genetically distinct cluster of one or more populations within a taxonomic species that resulted because gene flow between the cluster and other populations of the same species has been zero or very low over sufficient geological time.

(20) "**Genetic Resources**" means the kind and frequency of genes found within a population or collection of populations.

(22) "**Goal**" means a statement of intent which leads to policy, rules, and operation plans for implementation of a Department Program.

(23) "**Hatchery produced fish**" means a fish incubated or reared under artificial conditions for at least a portion of its life.

(24) "**Hatchery Program**" means a program in which a specified hatchery population is planted in a specific geographical location.

(26) "**Indigenous**" means descended from a population that is believed to have been present in the same geographical area prior to the year 1800 or that resulted from a natural colonization from another indigenous population.

(27) "**Management Plan**" means:

(a) A plan adopted by the Fish and Wildlife Commission which provides the basic framework (goals, policies and objectives) for managing a resource, geographic area, watershed (waterbody) or species; and

(b) Which may include specific information or alternatives relative to how the goals and policies may be achieved.

(29) "**Mitigation**" means to lessen the impact of activities or events that cause fish or habitat loss.

(30) "**Naturally Spawned**" means fish produced in the natural environment as the result of natural reproduction.

(32) "**Objective**" means a specific statement of planned results to be achieved by a predetermined date. Attainment of objectives represents measurable progress toward attainment of the broader goal.

(33) "**Operating Principle**" means a mandatory direction or approach to carrying out a Department program.

(34) "**Operation plan**" means an action plan developed by the Department that generally addresses how the objectives in a management plan for harvest or production of a species shall be attained.

(35) "**Optimum**" means the desired fish production level as stated in management plans or set by specific Commission action.

(37) "**Policy**" means mandatory direction or constraints that provide the framework for Department programs.

(38) "**Population**" means a group of fish spawning in a particular area at a particular time which do not interbreed to any substantial degree with any other group spawning in a different area or in the same area at a different time.

(39) "**Population fragmentation**" means the process by which natural or human-caused events cause a single, large breeding population to be broken up into two or more smaller new breeding populations.
(40) "**Presmolt**" means a juvenile anadromous fish which has fed and reared but is not yet a smolt.
(41) "**Production**" means the number or pounds of fish raised in a hatchery or resulting from natural spawning and rearing in freshwater, estuarine, or ocean habitats; also used in reference to harvest.
(43) "**Rehabilitation**" means short-term management actions which may include fish stocking, habitat improvement, harvest management, or other work, that restore fish populations depressed by natural or man-made events.
(44) "**Rehabilitation fish**" means a fish from a hatchery program that has wild-type phenotypes and is used for one life cycle in a program to rebuild a depressed population of wild fish.
(45) "**Risk**" means the extent to which, a management practice may reduce population productivity or cause an undesirable change in genetic characteristics of a population.
(47) "**Significant or substantial**" means a condition of sufficient magnitude such that it is likely to influence continued natural production at optimum levels.
(48) "**Smolt**" means a juvenile salmon or trout that is capable of initiating a seaward migration and is capable of living in the sea.
(50) "**STEP**" means Salmon Trout Enhancement Program.
(51) "**Stock**" means an aggregation for management purposes of fish populations which typically share common characteristics such as life histories, migration patterns, or habitats.
(52) "**Stray**" means a hatchery fish that spawns naturally in a location different from the location intended when the fish was stocked.
(53) "**Supplementation**" means continued planting of fish to maintain or increase fish abundance in areas where natural production is insufficient to meet management objectives.
(55) "**Transgenic fish**" means fish that have genes or groups of genes that have been transferred from another organism through the process of genetic engineering.
(56) "**Wild fish**" means any naturally spawned fish in the taxonomic classes, Agnatha, Chondrichthyes, and Osteichthyes, belonging to an indigenous population.
(57) "**Wild Fish Management**" means all of the constraints, operating principles, and direction embodied in both the Natural Production Rules and the Wild Fish Management Rules.

General Fish Management Goals

635-07-510 -- Fish Management Goals
(1) The overriding goal of fish management is to prevent the serious depletion of any indigenous fish species through the protection of native ecological communities, the conservation of genetic resources, and control of consumptive uses such that fish production is sustainable over the long term.
(2) Consistent with 635-07-510(1), populations of naturally reproducing fish shall be managed to take full advantage of the productive capacity of natural habitats.
(3) Consistent with 635-07-510(1), hatchery fish shall be managed primarily for the maximum benefit to consumptive users.
(4) Consistent with 635-07-510(1), the Department shall address losses in fish productivity due to habitat degradation through habitat restoration rather than through long-term harvest restrictions. **Adopted 5-20-92, ef. 6-1-92**

635-07-515 -- Management Plans
(1) Resources of the state shall be managed according to plans which set forth goals, objectives and operating principles for management of species, waters, or areas. Such plans are a primary means of implementing Department policies regarding fish management.
(2) The planning process shall provide for participation of the affected public and for interagency coordination, during development, review and modification of plans.
(3) Goals, objectives, and operating principles included in plans shall be brought to the Commission for adoption as Oregon Administrative Rules in public hearing. Until formal plans are adopted for a particular species, water, or area, management shall continue within existing guidance of statute, administrative rules, Commission directive, and various contracts or agreements with other agencies. **Adopted 1-15-92, ef. 2-1-92**

Natural Production Policy

635-07-521 -- Purpose of Natural Production Rules

(1) These rules are established to guide the management of natural production of indigenous and foreign fishes. Together with the Wild Fish Rules, they provide the framework for managing naturally reproducing populations of freshwater and anadromous fish.

(2) The Natural Production Rules (OAR 635-07-521 through 635-07-524) apply to the management of all populations of naturally reproducing freshwater and anadromous fish except those populations of foreign fish for which natural production is determined not to be a management objective.

(3) Additional policies and operating principles for wild fish are further provided in the Wild Fish Management Rules (OAR 635-07-525 through 635-07-529). These rules provide a genetic resource protection policy for those indigenous fish defined as wild fish. **Adopted 1-15-92, ef. 2-1-92**

635-07-522 -- General Policies for Natural Production Management

It is the policy of the Commission to protect and promote natural production of indigenous and, where desirable, foreign fishes. Pursuant to ORS 496.012, ORS 496.435, ORS 506.036, and ORS 506.109, the Commission's overriding responsibility, through the management of individual populations, is to prevent the serious depletion of any indigenous species. To the extent consistent with that mandate, it is also the Commission's responsibility to manage fish for optimum economic, commercial, recreational, and aesthetic benefits for present and future generations. **Adopted 1-15-92, ef. 2-1-92**

635-07-523 -- Operating Principles for Natural Production Management

The following principles are intended to provide direction to the natural production management programs of the Department.

(1) Habitat: Because fishes require suitable habitats for natural production throughout all life stages, the Department shall strongly advocate and support habitat protection and restoration on private and public lands. Habitat protection and restoration are necessary to maximize productivity, conserve fitness and life history characteristics, and maintain healthy populations. However, while habitat restoration is an important management activity, the Department shall not support habitat restoration in lieu of habitat protection. The Department shall oppose degradation of habitat quantity or quality that poses a risk to meeting natural production objectives of management plans.

(2) Competition, predation, and disease: Introductions of fishes of the same or different species as those already present may seriously reduce natural production through competition for food and space or through predation. Introduction of disease also may reduce natural production. The Department shall oppose any actions that allow competition, predation, or disease to prevent meeting natural production objectives of management plans.

(3) Harvest: Providing the opportunity for optimum harvest benefits is consistent with natural production management. However, the Department shall oppose harvest strategies that endanger the long-term viability of a population or that pose a risk to meeting natural production objectives of management plans.

(4) Use of hatchery fish: Where there are existing hatchery programs and the potential for enhancement of natural production exists, hatchery programs shall be designed to make full use of this potential. **Adopted 1-15-92, ef. 2-1-92**

635-07-524 -- Implementation of Natural Production Rules

Natural production rules shall be implemented through Department basin plans. **FWC 6-1990, f. & ef. 1-29-90**

Wild Fish Management Policy

635-07-525 -- Purpose of Wild Fish Management Rules

These rules are established to guide the management and conservation of genetic resources of wild fish in Oregon. Although direction with respect to natural production is provided by OAR 635-07-521 through 635-07-524, additional guidance is required to assure that genetic resources of wild fish are protected. **FWC 6-1990, f. & ef. 1-29-90**

635-07-526 – General Policies of Wild Fish Management

(1) Protection of genetic resources shall be the priority in the management of wild fish to assure optimum economic, commercial, recreational, and aesthetic benefits for present and future residents of Oregon.

(2) It is the policy of the Department to implement the Wild Fish Management Rules for all populations of wild fish except those populations specifically exempted by the Commission in accordance with OAR 635-07-528.

(3) It is recognized that management of some populations may not currently be fully consistent with these rules. However, it is the Department's long-term goal to bring these populations into compliance, with the exception of populations specifically exempted by the Commission in accordance with OAR 635-07-528. **FWC 6-1990, f. & ef. 1-29-90**

635-07-527 – Operating Principles for Wild Fish Management

The Department recognizes that the operating principles developed to implement this policy are associated with varying levels of uncertainty. These principles shall be continuously revised as better information becomes available. In addition to the operating principles of the Natural Production Rules (OAR 635-07-521 through 635-07-524), the operating principles set forth in this section apply to the management of populations of wild fish.

(1) Wild populations of the following species shall be managed under these operating principles:
(d) *Oncorhynchus mykiss*, (anadromous form) commonly known as steelhead;

(2) Interbreeding of hatchery and wild fish: The interbreeding of hatchery fish with wild fish of the same taxonomic species poses risks to conserving and utilizing the genetic resources of wild populations. To reduce this risk, naturally spawning hatchery fish, whether originating from on-site releases or from strays from other release sites, shall be limited by both number in the natural spawning population and genetic characteristics. Options consistent with these rules are:
(a) Release no hatchery fish;
(b) Release hatchery fish that meet the following minimum standards and limit the number of hatchery fish in the naturally spawning population to 50% or less of the breeding population:
(A) Originates from wild fish belonging to the population specified by the statewide wild population list (OAR 635-07-529(3)) for the geographic location under consideration;
(B) After broodstock is initiated, incorporates at least 30% wild fish on the average every brood year;
(C) Twenty-five percent or less of the wild donor population is taken for hatchery brood stock in any year;
(D) No intentional artificial genetic changes occur; unintentional artificial changes are avoided;
(E) Wild-type phenotypes are maintained in hatchery fish;
(F) The hatchery program shall be monitored annually and evaluated every 10 brood years to determine if the standards in paragraphs (A) through (E) are being met. If the standards are not being met, the number of hatchery fish spawning in the natural population shall be decreased as directed in subsection (c) of this section.
(c) Release hatchery fish, but limit the number of hatchery fish spawning in the natural population such that the further the deviation from the requirements of subsection (b) of this section the lower the proportion of hatchery fish that shall be allowed to spawn in the natural population consistent with current Department guidelines. Hatchery fish that do not at least meet the standards in paragraphs (A) and (C) in subsection (b) of this section shall be restricted to less than 10% of the naturally spawning population.

(3) Special Rehabilitation Programs: The Department recognizes that the use of hatchery produced fish may be an important strategy to restore depressed populations of wild fish. Such use of hatchery fish in a program to restore a depressed population shall meet the requirements of subsection (b) of section (2) of this rule provided, however, that if the Department finds that strict adherence to such requirements is likely to prevent restoration of the population the Department may allow use of hatchery fish subject to the following conditions:
(a) Deviation from the standards in subsection (b) of section (2) of this rule shall not occur for more than one life cycle unless approved by the Commission;
(b) The rationale for the deviation shall be documented in written form;
(c) Specific standards and guidelines for the rehabilitation program shall be documented in written form.

(4) Species hybridization: Species hybridization which results in the production of offspring with reduced reproductive capacity is detrimental to wild populations. The Department shall not authorize introductions of nonindigenous fish into locations where species hybridization may be expected to occur.

(5) Transgenic fish: The Department shall not authorize the release of transgenic fish into locations where such fish may gain access to wild fish populations in accordance with OAR 635-07-545.

(6) Habitat: Degradation of habitat that reduces the potential for fish production, causes population fragmentation or adversely affects fish migration routes poses a risk to conserving and utilizing the genetic resources of wild populations.
   (a) The Department shall oppose habitat degradation that causes a population to experience a decline in abundance that if continued would likely reduce the number of spawners to 300 breeding fish. In addition, the Department shall advocate the restoration of degraded habitat that has depressed a population to a level of 300 or fewer spawners. Populations that are declining toward, or have reached, 300 breeding fish shall be considered to be inconsistent with these rules, except under the conditions specified in section (10) of this rule.
   (b) The Department shall oppose habitat degradation or the construction of artificial blockages that cause a population to be subdivided into fragments. If population fragmentation does occur, the fragments shall be treated as separate breeding populations and managed according to the standards of this policy. In addition, where population fragmentation is identified as a problem, the Department shall advocate and seek the restoration of degraded habitat or consider advocating the removal of artificial barriers that have the potential for reestablishing genetic exchange between the populations.

(7) Competition, predation, and disease: Releases or transplants of fish of the same or different species, including hybrid fish, may seriously reduce the survival of wild fish through competition for food and space or through predation. Introductions of disease may also deplete a wild population. An extreme level of mortality from these sources poses a risk to conserving and utilizing the genetic resources of wild populations. The Department shall oppose any actions that allow mortality from competition, predation or disease to cause a population to experience a decline in abundance that if continued would likely reduce the number of spawners to 300 breeding fish. In addition, where a population has been depressed to a level of 300 or fewer spawners, the Department shall support and advocate actions to correct the cause of such population decrease.

(8) Harvest: Providing the opportunity for optimum harvest benefits is consistent with wild fish management. However, an extreme level of harvest poses a risk to conserving and utilizing the genetic resources of a wild population. The Department shall oppose harvest strategies that are the major cause for a population to experience a decline in abundance that if continued would reduce the number of spawners to 300 breeding fish or that would cause a population to be subdivided into fragments. In addition, the Department shall advocate the termination of harvest strategies that have depressed a population to a level of 300 or fewer spawners.

(9) Evidence of Loss of Genetic Variation: The Department shall consider a sudden disproportionate reduction within a wild fish population that causes a significant reduction in genetic variation to be a condition for which the Department shall take mitigative actions as appropriate.

(10) Small populations: It is recognized that even in the absence of changes brought on by human activities, populations of 300 or fewer spawners may exist naturally. Such populations have survived even though random genetic processes, operating over long periods of time, have probably caused a reduction in genetic variation. Often in the process of losing this variation, rare genetic characteristics become established. The Department shall consider such populations to be consistent with the population size standards of this policy, but shall consider the protection of these small populations to be highly desirable because of the unique features they contain.

(13) Aggregate stock fishery management: Some fisheries, such as ocean salmon fisheries, target on aggregations of fish belonging to many different populations. In implementing the Wild Fish Management Rules (OAR 635-07-529), the Department shall pursue the most cost effective, least disruptive (in terms of adverse social and economic impacts on those fisheries), and feasible strategy consistent with the policies and operating principles set forth in the rules. To bring individual populations into compliance with wild fish management, priority shall be given to correcting problems through the development, listing, selection, and implementation of corrective actions as they relate to use of hatchery fish, habitat, competition, predation, disease, and other known sources of mortality before harvest restrictions on any aggregate stock fishery shall be considered. **Adopted 5-20-92, ef. 6-1-92**

635-07-528 – Wild Fish Management Exemption Procedure

(1) The Commission may decide, at the request of any person, the Department, or on its own initiative, to determine whether a population shall be exempted from wild fish management.

(2) Such exemptions shall be scheduled for consideration through a rule making either at the next meeting at which the Commission adopts or reviews a basin plan for the area where the population is found, or at the next meeting at which the wild fish management progress report, described in OAR 635-07-529(8), shall be presented.

(3) Before scheduling a rule making on a proposed exemption, the Commission shall direct the Department to prepare a written analysis describing the biological significance and long-term implications of impairing or losing the genetic resources of the population proposed for exemption. The Department's report shall also assess whether the proposed exemption would cause a serious depletion of the species within Oregon. In addition, the Commission shall request that the proponent of the exemption prepare a written analysis of the social and economic justification for such action.
(4) The analyses described in section (3) of this rule shall be made available for public review and comment at least 45 days in advance of the rule making on the proposed exemption.
(5) To exempt a population, the Commission shall find that social and economic considerations offset biological consequences, and that such exemption, when considered alone and in light of any other exemptions that have been granted, shall not threaten a gene conservation group or otherwise cause a serious depletion of the species within Oregon. **Adopted 5-20-92, ef. 6-1-92**

635-07-529 -- Implementation of Wild Fish Management Rules
(1) In implementing the Wild Fish Management Rules, the Department shall select strategies that are feasible and biologically sound, and shall consider both cost and social and economic impacts.
(2) The Department shall not impose fishery restrictions for the purpose of implementing the Wild Fish Management Rules by processes other than described in OAR 635-07-529(8) (Wild Fish Management Implementation Report), OAR 635-11-050 (Statewide Angling Regulations), OAR Chapter 635, Divisions 3, 41, and 42 (Commercial Fishery Regulations), or other formal actions of the Commission.
(3) Within one year of the effective date of these rules, the Department shall develop, for approval by the Commission, a provisional statewide list of populations of wild fish. This list shall be made available to the public for review prior to Commission consideration and approval.
(4) It is the intent of the Commission that any basin and/or species plan already adopted shall be governed as of the effective date of these rules by these rules. As existing plans are reviewed and new plans are adopted, the Commission intends that they shall be brought into explicit conformity with these rules.
(5) Basin plans presented to the Commission shall present at least one alternative strategy per wild population that is consistent with wild fish management. For those basins with existing hatchery programs, two alternatives consistent with wild fish management shall be presented; one without the hatchery program and one with the hatchery program.
(6) The Department shall not release hatchery fish into wild fish populations if such activities are not already occurring, without authorization in a basin plan approved by the Commission or an exemption of the wild population in accordance with OAR 635-07-528.
(7) The Department shall develop guidelines to make determinations of population extinctions consistent statewide. Findings of extinctions shall be provided for public review and reported to the Commission and public in fish management plans or in the biennial wild fish management report, as appropriate.
(8) Progress toward achieving consistency with these Wild Fish Management Rules shall be reported to the Commission during the first six months of each biennium, prior to preparation of the next biennial budget. Beginning in 1991, each such biennial report shall include, by species, the following information:
  (a) Documentation of the management history of each wild population, which shall be based on best available information. This shall include the current status of the population and a history of habitat change, harvest, and hatchery introductions;
  (b) A list of populations of wild fish not currently managed consistent with the Wild Fish Management Rules;
  (c) Identification and description of the problems preventing the Department from achieving consistency with the Wild Fish Management Rules for each of these populations;
  (d) A discussion of any segment of a population that has been reduced or lost, and an evaluation of the cause and consequences of this reduction or loss on the long-term genetic status of the population;
  (e) Identification of those species or subspecies that have a limited world-wide distribution;
  (f) A description of the short- and long-term strategies and associated funding necessary to solve these problems; and
  (g) A list of Commission actions, as appropriate, necessary to implement strategies identified in subsection (f) of this section. **Adopted 5-20-92, ef. 6-1-92**

Wild Fish Gene Resource Conservation Policy

635-07-536 – General Policies for Wild Fish Gene Conservation

(1) Wild fish shall be managed to maintain their adaptiveness and genetic diversity. These characteristics are important for maintaining the evolutionary potential of populations and preventing the serious depletion of these species in natural ecosystems. The Department recognizes and accepts that genetic changes will occur as part of the natural evolutionary process.

(2) Further policies and operating principles for wild fish management and species conservation are provided in statutes and rules, including the Wildlife Policy (ORS 496.012(1)), the Natural Production Policy (OAR 635-07-521 through 635-07-524), the Wild Fish Management Policy (OAR 635-07-525 through 635-07-529), the Fish Management Plans (OAR Chapter 635 Division 500), the Threatened and Endangered Species Act and rules (ORS 496.172 through 496.192 and OAR 635-100-100 through 635-100-130), and the Sensitive Species rule (OAR 635-100-040). **Adopted 5-20-92, ef. 6-1-92**

635-07-537 – Operating Principles for Wild Fish Gene Conservation

(1) Conditions of low or zero gene flow between populations or groups of populations over sufficient periods of geological time can lead to potentially measurable genetic differences between the groups, including the formation of new subspecies or species. The Department shall recognize that wild fish species are comprised of one or more of these groups which shall be called gene conservation groups. The gene conservation groups shall be comprised of one or more of the breeding populations managed under the Wild Fish Management Policy (OAR 635-07-525 through 635-07-529).

(2) The loss of any gene conservation group shall be considered by the Department to constitute a serious depletion of that species.

(3) Exemptions of breeding populations from the Wild Fish Management Policy, either alone or in light of other exemptions, which would threaten the continued existence of any gene conservation group, or would otherwise cause a serious depletion of a species, shall not be approved under OAR 635-07-528.

(4) Habitat which is essential for the continued existence of any gene conservation group shall be subject to the habitat mitigation goals and standards in the Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-030, section (1) or (2)). **Adopted 5-20-92, ef. 6-1-92**

635-07-538 – Implementation of the Wild Fish Gene Conservation Program

(1) The Department shall develop, for approval by the Commission, a provisional list of gene conservation groups for each wild fish species listed in OAR 635-05-527(1) as part of the 1994 Wild Fish Management biennial report. The list thereafter shall be reviewed and revised as necessary every two years.

(2) The Department shall develop and implement a wild fish monitoring program. The purpose of the program is to provide systematic time series data collection and analysis that will be used to determine whether populations and gene conservation groups are coping with the evolutionary challenges posed by the dynamic environments in which they live. A report on the status of each gene conservation group shall be provided to the Commission every two years as part of the Wild Fish Management Policy biennial report.

(3) The Department shall develop and implement a gene resource research plan. The purpose of the research will be to address specific questions about issues such as fish systematics, taxonomy and population structure, evolutionary processes, and population genetics that will influence Wild Fish Management Policy standards and other aspects of fish management. The plan shall be updated every five years. Progress reports and final reports of research results shall be provided to the Commission and public. **Adopted 5-20-92, ef. 6-1-92**

Hatchery Fish Gene Resource Management Policy

635-07-540 – General Policies for Hatchery Fish Gene Conservation

(1) Hatchery fish populations shall be managed to maintain genetic diversity, to assure that the populations meet the management objectives for which they are produced, and to maintain their optimum biological and economic value.

(2) Further policies and operating principles for hatchery fish gene resource management are provided in the Natural Production Policy (OAR 635-07-521 through 635-07-525), the Wild Fish Management Policy (OAR 635-07-525 through 635-07-529), the Fish Management Plans (OAR Chapter 635 Division 500), the Salmon Management rules (OAR 635-07-800), and OAR 635-07-810 through 635-07-830. **Adopted 5-20-92, ef. 6-1-92**

635-07-541 -- Implementation of Hatchery Fish Gene Conservation

(1) It is the intention of the Department to develop and implement management objectives for all hatchery programs in the state. The management objectives shall include a statement of intent and a description of the hatchery programs. These management objectives shall be developed as existing basin plans are reviewed and new basin plans are adopted under OAR Chapter 635 Division 500.

(2) For existing hatchery programs and for new hatchery programs that are implemented prior to the development of management objectives in basin plans as directed in section (1) of this rule, the Department shall compile or develop management objectives that include a statement of intent and a description of the hatchery programs as would be required in the basin plans.

(3) After the development of the management objectives the Department shall develop operational guidelines to implement the hatchery program and accomplish the objective. These guidelines are intended to maintain the genetic resources of the hatchery populations, and shall be consistent with the Wild Fish Management Policy hatchery standards provided under OAR 635-07-527(2). **Adopted 5-20-92, ef. 6-1-92**

APPENDIX H

Wild Fish Management Policy Implementation Guidelines

The Department has developed guidelines which specify alternate strategies for hatchery programs to meet the requirements of OAR 635-07-527 -- Operating Principles for Wild Fish Management section (2) (c).

Type 1	Type 2	Type 3	Type 4
Hatchery fish limited to 50% or less of the naturally spawning population	Hatchery fish limited to 30% or less of the naturally spawning population	Hatchery fish limited to 10% or less of the naturally spawning population	Hatchery Fish limited to 5% or less of the naturally spawning population
Originates from the same wild population	Originates from the same wild population	Originates from the same gene conservation group	Originates from a different gene conservation group
After broodstock is initiated, incorporates an average of at least 30% wild fish per brood year.	After broodstock is initiated, incorporates an average of at least 5% wild fish per brood year.	Not required to incorporate wild fish	Not applicable
25% or less of the wild population is taken for hatchery brood stock annually	25% or less of the wild population is taken for hatchery brood stock annually.	25% or less of the wild population is taken for hatchery brood stock annually.	25% or less of the wild population is taken for hatchery brood stock annually.
No intentional artificial genetic changes; unintentional artificial changes avoided	Minimum amount of artificial genetic changes permitted	Artificial genetic changes may occur	Not applicable
Monitoring program demonstrates that wild-type phenotypes are maintained in hatchery fish	Monitoring program demonstrates that changes from wild-type phenotypes are moderate	Wild type phenotypes may be lost from hatchery fish	Not applicable

APPENDIX I

OAR 635 Division 500 -- Basin Plans, Portions Relevant to Management of Steelhead

The administrative rules contained in Division 500 are the legally enforceable elements of basin plans. Basin plans are comprehensive documents which the Department regards both as a means to implement policy and as an explanation of the intent and rationale of management direction. Complete copies of all plans are available from the Department.

North Umpqua River Below Soda Springs Dam

635-500-20 The Department of Fish and Wildlife will emphasize summer and winter steelhead and spring chinook in the North Umpqua River below Soda Springs Dam.

(1) Summer Steelhead:

(a) Manage summer steelhead in the North Umpqua for wild and hatchery fish (Wild Fish Policy option #2 OAR 635-07-525) *(This OAR has been replaced by the new Wild Fish Policy)*;

(b) Enhance wild summer steelhead runs to increase the current level of steelhead passing Winchester Dam (short-term goal);

(c) Based on the long-term objectives of the USFS and ODFW fish habitat improvement plans, enhance wild summer steelhead runs to increase the level of steelhead passing Winchester Dam to a range of 6,000 to 8,000 fish (long term + 20 years);

(d) Increase numbers of hatchery summer steelhead adults to a range of 5,000-10,000 crossing Winchester Dam;

(e) Maintain the genetic integrity of North Umpqua summer steelhead consistent with the Wild Fish Policy, OAR 635-07-525.

(2) Winter Steelhead:

(a) Manage North Umpqua winter steelhead for wild fish only (option #1 OAR 635-07-525) *(This OAR has been replaced by the new Wild Fish Policy)*;

(b) Enhance wild winter steelhead runs to increase current levels passing Winchester Dam (short-term goal);

(c) Based on the long-term objectives of the USFS and ODFW habitat improvement plans, enhance wild winter steelhead runs to increase levels passing Winchester Dam to a range of 8,000-10,000 fish;

(d) Maintain genetic integrity of North Umpqua winter steelhead consistent with the Wild Fish Policy, OAR 635-07-525 **FWC 12-1986, f. & ef. 4-17-86**

McKenzie Subbasin Fish Management

635-500-269 -- Summer Steelhead

(1) The following policy applies to summer steelhead in the McKenzie River subbasin: Summer steelhead will be managed for production and harvest of hatchery fish - Option (1)(c) OAR 635-07-525 of the Wild Fish Management Policy *(This OAR has been replaced by the new Wild Fish Policy)*.

(2) In accordance with this policy, it is the objective of the Department to:

(a) Provide an average annual sport catch of 1,200 adult summer steelhead produced from a maximum release of 120,000 smolts;

(b) Reduce the potential impact of summer steelhead on the production of native trout and spring chinook;

(c) Develop a brood stock from adults returning to the McKenzie River to produce smolts for the McKenzie and Middle Fork Willamette subbasins. **FWC 4-1988, f. & ef. 1-29-88**

635-500-270 -- Winter Steelhead

It is the policy of the Department that winter steelhead will not be released in the McKenzie River subbasin. **FWC 4-1988, f. & ef. 1-29-88**

Coos River Basin Fish Management

635-500-420 -- Winter Steelhead

(1) The following operating principles apply to winter steelhead in the Coos River basin:

(a) Steelhead shall be managed for wild fish. Hatchery releases shall be consistent with the Wild Fish Management Policy;

(b) Only locally adapted stock shall be used for enhancement. Alsea stock and the Coos-Coquille "regional" stock shall be phased out;
(c) Wild stock shall be incorporated in Department broodstock and rearing programs every year;
(d) Programs that approach the limits of the Wild Fish Management Policy shall be modified or reduced proportionately to maintain compliance with the policy.
(2) In accordance with these operating principles, it is the objective of the Department to:
(a) Increase the existing estimated natural spawning population of locally adapted steelhead to a minimum return level of 6,000 adults and increase the population above this level where the production capacity of present or enhanced habitat allows in the Coos River basin;
(b) Utilize supplementation with hatchery releases of locally adapted stock to increase the in-river sport fishery;
(c) Maintain an average harvest of 2,000 adult winter steelhead in the Coos River basin as measured by analysis of the salmon-steelhead catch card data. **FWC 110-1990, f. & ef. 10-1-90**

Tenmile Lakes Basin Fish Management

635-500-515 -- Winter Steelhead

(1) The following operating principles apply to winter steelhead in the Tenmile Lakes basin:
(a) Winter steelhead in the Tenmile Lakes basin shall be managed for wild fish with hatchery releases consistent with the Wild Fish Management Policy;
(b) Programs that approach the limits of the Wild Fish Management Policy shall be modified or reduced proportionately to maintain compliance with the Policy.
(2) In accordance with these operating principles, it is the objective of the Department to:
(a) Increase the natural production of steelhead in tributaries of Tenmile and North Tenmile Lakes by creating additional rearing habitat to be colonized by wild juveniles, resulting in an average run of at least 400 wild spawners and supplement the population above this level with hatchery production to a minimum average annual catch of 600 fish from releases in Eel Lake and possibly Saunders Creek;
(b) Provide a recreational fishery in the Tenmile Lakes basin to harvest up to 10% of the wild steelhead and as many hatchery steelhead as possible. **FWC 14-1991, f. 2-28-91, ef. 3-1-91**

Yaquina River Basin Fish Management

635-500-625 -- Winter Steelhead

(1) The following operating principles apply to winter steelhead in the Yaquina River basin:
(a) Winter steelhead shall be managed for wild production, consistent with the Wild Fish Management Policy (OAR 635-07-525 through 635-07-529). Hatchery winter steelhead may be released into the basin provided releases are consistent with the Wild Fish Management Policy;
(b) Steelhead stocks approved for use in the Yaquina River basin are Alsea winter and Yaquina winter;
(c) Programs that challenge the limits of the Wild Fish Management Policy shall be modified or reduced proportionately to maintain compliance with the Policy.
(2) In accordance with these operating principles, it is the objective of the Department to:
(a) Maintain the production of wild steelhead in the Yaquina River basin at an average annual minimum of 1,300 adults;
(b) Design and implement a hatchery program that will be compatible with requirements of the Wild Fish Management Policy;
(c) Maintain a harvest rate of no more than 20% on wild fish. The harvest rate on hatchery fish shall be equal or greater than the harvest rate on wild fish. **FWC 15-1991, f. 2-28-91, ef. 3-1-91**

Clackamas Subbasin Fish Management

635-500-820 -- Winter Steelhead

(1) The following operating principles apply to the Clackamas subbasin:
(a) Winter steelhead in the Clackamas subbasin shall be managed for natural and hatchery production consistent with the Wild Fish Management Policy;
(b) The lower subbasin below River Mill Dam shall be managed primarily for the production and harvest of Big Creek and Eagle Creek stocks of hatchery fish. Fry releases shall be limited to Rock, Clear, Foster, Deep, and Eagle creeks;
(c) The subbasin above North Fork Dam shall be managed for natural production of the indigenous stock.
(2) In accordance with these operating principles, it is the objective of the Department to:
(a) Increase spawning escapement of the indigenous stock of winter steelhead above the North Fork Dam to 3,000 fish;
(b) Increase the potential average annual harvest of winter steelhead in the subbasin to 8,000 fish (2,000 in Eagle Creek and 6,000 in the main stem of the Clackamas River, above and below River Mill Dam). **Adopted 1-15-92, ef. 2-1-92**

635-500-830 -- Summer Steelhead
(1) The following operating principle apples to the Clackamas subbasin:
(a) Summer steelhead shall be managed for hatchery production in the subbasin.
(b) Summer steelhead smolts shall be released into streams that have suitable adult holding habitat throughout the summer and where adults will provide optimum recreational opportunity;
(c) Only smolt sized fish will be released to minimize competition with native salmonids.
(2) In accordance with this operating principle, it is the objective of the Department to:
(a) Minimize competition and possible interbreeding between non-indigenous summer steelhead and indigenous stocks of anadromous salmonids and resident trout;
(b) Provide a potential average annual harvest of 7,000 summer steelhead in the Clackamas subbasin. **Adopted 1-15-92, ef. 2-1-92**

Coast Fork Willamette Subbasin Fish Management
635-500-950 -- Winter Steelhead
It is the objective of the Department that the Coast Fork Willamette subbasin shall not be managed for winter steelhead. **Adopted 1-15-92, ef. 2-1-92**

Coast Range Subbasin Fish Management
635-500-101 -- Winter Steelhead
(1) The following operating principle applies to the Coast Range subbasin:
(a) The naturally produced run of winter steelhead shall not be enhanced with releases of hatchery fish pending an analysis of the status of wild steelhead populations in the subbasin.
(2) In accordance with this operating principle, it is the objective of the Department to:
(a) Maintain an average annual spawning escapement of 675 adult winter steelhead in the Coast Range subbasin;
(b) Provide a potential average annual sport harvest of about 175 winter steelhead in the Coast Range subbasin. **Adopted 1-15-92, ef. 2-1-92**

Long Tom Subbasin Fish Management
No objectives for steelhead

Main Stem Willamette Subbasin Fish Management
635-500-116 -- Winter Steelhead
(1) The following operating principle applies to the Main Stem Willamette subbasin:
(a) Escapement of late-run winter steelhead to tributary subbasins has priority over harvest in the main stem Willamette River.
(2) In accordance with this operating principle, it is the objective of the Department to:
(a) Increase the average annual run size to about 33,000 winter steelhead into the Willamette River;
(b) Increase the average annual run of indigenous, late-run (15 February-15 May) winter steelhead above Willamette Falls to about 17,000 fish, which includes a spawning escapement of 14,400 fish for natural production;
(c) Provide a potential average annual sport catch of 1,000 winter steelhead in the lower main stem Willamette;
(d) Increase the average annual sport catch of winter steelhead above Willamette Falls to 500 fish. **Adopted 1-15-92, ef. 2-1-92**
635-500-117 -- Summer Steelhead
It is the objective of the Department to increase the recreational catch of summer steelhead above Willamette Falls to an average annual minimum of 500 fish. **Adopted 1-15-92, ef. 2-1-92**

Middle Fork Willamette Subbasin Fish Management
635-500-130 -- Summer Steelhead
(1) The following operating principle applies to the Middle Fork Willamette subbasin:
(a) Summer steelhead shall not be passed above Fall Creek or Dexter dams.
(b) Summer steelhead smolts shall be released into streams that have suitable adult holding habitat throughout the summer and where adults will provide optimum recreational opportunity;
(c) Only smolt-sized fish will be released to minimize competition with native salmonids.
(2) In accordance with this operating principle, it is the objective of the Department to:
(a) Provide diversity of angling opportunity with an annual sport catch of 2,250 summer steelhead in the subbasin;
(b) Minimize impact of summer steelhead on the production of native trout. **Adopted 1-15-92, ef. 2-1-92**
635-500-131 -- Winter Steelhead
(1) The following operating principle applies to the Middle Fork Willamette subbasin:
(a) Winter steelhead shall be managed for natural and hatchery production.

(2) In accordance with this operating principle, it is the objective of the Department to:
(a) Increase the number of winter steelhead returning to the Middle Fork subbasin to an annual average of 800 adults;
(b) Increase the catch of winter steelhead to 160 fish in the Middle Fork subbasin.
Adopted 1-15-92, ef. 2-1-92

Molalla and Pudding Subbasins Fish Management

635-500-138 – Winter Steelhead

(1) The following operating principles apply to the Molalla and Pudding subbasins:
(a) The native winter steelhead stock has priority over all other non-native stocks and species in the Molalla and Pudding subbasins;
(b) Winter steelhead in the Molalla subbasin shall be managed for natural and hatchery production;
(c) Winter steelhead in the Pudding subbasin shall be managed for natural production. No hatchery-produced winter steelhead, including STEP fry, shall be released into the Pudding subbasin;
(d) Spawning escapement has priority over harvest.
(2) In accordance with these operating principles, it is the objective of the Department to:
(a) Maintain the genetic integrity and productivity of the native late stock;
(b) Maintain an average annual escapement of at least 3,500 late-run winter steelhead in the Molalla system;
(c) Maintain an average annual escapement of at least 1,250 winter steelhead in the Pudding system;
(d) Maintain a potential average annual sport harvest of about 600 late-run winter steelhead from the Molalla subbasin;
(e) Continue to provide an average annual sport catch of at least 500 early-run hatchery-produced winter steelhead in the Molalla River, primarily during December through February;
(f) Maintain an annual sport harvest of about 100 winter steelhead from the Pudding subbasin.
Adopted 1-15-92, ef. 2-1-92

635-500-139 – Summer Steelhead

(1) The following operating principles apply to the Molalla and Pudding subbasins:
(a) Summer steelhead in the Molalla subbasin shall be managed for harvest of hatchery fish. The run shall be monitored for possible natural reproduction;
(b) Summer steelhead hatchery releases shall be confined to reaches below RM 35 in the main stem Molalla River to avoid interactions with native winter steelhead in upper reaches of the subbasin and to provide better harvest opportunities;
(c) Summer steelhead smolts shall be released into streams that have suitable adult holding habitat throughout the summer and where adults will provide optimum recreational opportunity;
(d) Only smolt-sized fish will be released to minimize competition with native salmonids.
(2) In accordance with these operating principles, it is the objective of the Department to:
(a) Increase the potential average annual sport catch to 2,450 fish from an average annual return of 4,900 fish;
(b) Minimize the potential impacts of summer steelhead on native winter steelhead and trout.
Adopted 1-15-92, ef. 2-1-92

Santiam and Calapooia Subbasins Fish Management

635-500-149 – Winter Steelhead

(1) The following operating principles apply to the Santiam and Calapooia subbasins:
(a) Winter steelhead in the main stem Santiam River and North Santiam system shall be managed for natural and hatchery production;
(b) Winter steelhead in the South Santiam system and Calapooia subbasin shall be managed for natural production. No hatchery-produced winter steelhead shall be released into the South Santiam or Calapooia subbasins;
(c) Protection of the run above Foster Dam has priority over harvest in the South Santiam;
(d) Protection of the native run in the Calapooia subbasin has priority over harvest.
(2) In accordance with these operating principles, it is the objective of the Department to:
(a) Provide an annual minimum escapement of 8,600 naturally produced winter steelhead adults to the Santiam subbasin and an annual average return of 1,200 hatchery adults to the North Santiam;
(b) Minimize the genetic impacts of hatchery releases on the naturally produced North Santiam stock;
(c) Reestablish a winter steelhead run in the North Santiam above Detroit Reservoir;
(d) Increase escapement to 650 winter steelhead in the South Santiam above Foster Dam;
(e) Reestablish the winter steelhead run above Green Peter Dam;
(f) Provide an annual minimum escapement of 1,170 winter steelhead adults to the Calapooia subbasin;

(g) Provide an average annual sport catch of 290 fish (200 natural plus 90 hatchery-produced) in the main stem Santiam and 870 fish (600 natural plus 270 hatchery-produced) in the North Santiam, and provide a catch-and-release fishery in the South Santiam;
(h) Provide a potential average annual harvest of 140 winter steelhead in the Calapooia.
Adopted 1-15-92, ef. 2-1-92

635-500-150 -- Summer Steelhead

(1) The following operating principles apply to the Santiam and Calapooia subbasins:
(a) Summer steelhead shall be managed for production and harvest of hatchery fish. The Department shall monitor the run for possible natural production;
(b) Summer steelhead smolts shall be released into streams that have suitable adult holding habitat throughout the summer and where adults will provide optimum recreational opportunity;
(c) Summer steelhead in the South Santiam River shall be confined to areas below Foster Dam to protect native winter steelhead production in the upper South Santiam;
(d) Only smolt-sized fish shall be released to minimize competition with native salmonids;
(e) Brood stock shall be collected May through October to maintain broad run-timing while reducing overlap with the run-timing of the native winter steelhead stock.
(2) In accordance with these operating principles, it is the objective of the Department to:
(a) Increase the potential average annual sport catch to 700 summer steelhead in the main stem Santiam, 4,500 in the North Santiam, and 5,600 in the South Santiam;
(b) Continue to maximize harvest of adults in the subbasin;
(c) Maintain a return of 2,000 adults to Foster Dam to meet brood stock needs;
(d) Minimize the potential impact of summer steelhead on native winter steelhead and trout.
Adopted 1-15-92, ef. 2-1-92

Tualatin Subbasin Fish Management

635-500-162 -- Winter Steelhead

(1) The following operating principles apply to the Tualatin subbasin:
(a) The Tualatin subbasin, except Dairy Creek, shall be managed for hatchery and natural production and harvest of Big Creek hatchery steelhead. Dairy Creek shall be managed for natural production;
(b) Fry or presmolts shall be used only in stream reaches where escapement of spawning adults and/or recruitment of fry is a demonstrated limiting factor for steelhead production.
(2) In accordance with these operating principles, it is the objective of the Department to:
(a) Maintain an average annual run of 2,000 winter steelhead to the Tualatin subbasin;
(b) Provide a potential average annual harvest of 400 winter steelhead in the Tualatin subbasin.
Adopted 1-15-92, ef. 2-1-92