GRANDE RONDE RIVER BASIN FISH MANAGEMENT PLAN

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INTRODUCTION

The Fish Management Plan for the Grande Ronde River basin was developed to guide management of fish and their habitat in the Grande Ronde River basin. This written plan identifies objectives that will be implemented by the Oregon Department of Fish and Wildlife (ODFW) within the basin. This plan also ranks the important activities. With a good understanding of the stated direction within the ODFW, priorities can be better and more easily accessed when developing biennial budgets, making routine work assignments, and decision making in crisis situations. By stating objectives for managing fisheries, fish populations, and habitat, the public and ODFW will have a better understanding of the direction being taken with these activities in the Grande Ronde River basin. The plan can also be used to inform other agencies of our objectives so that fishery considerations can be included when planning other land-use activities.

The Fish Management Policy of the Oregon Department of Fish and Wildlife directs that fish management plans will be prepared for each basin or management unit. The Fish Management Plan for the Grande Ronde River Basin (hereafter referred to as the Grande Ronde River Basin Plan or the Plan) is just one part of the overall planning effort of the ODFW. Individual species plans contain statewide policies and guidelines, and provide general direction for writing basin plans. The Grande Ronde River Basin Plan incorporates appropriate portions of the above plans, and will be the primary document used to guide fishery management of the public resource in this basin.

The Grande Ronde River Basin Plan was developed through an advisory process that included ODFW staff, tribal agencies, a committee of citizen advisors [Public Advisory Committee (PAC)] representing a diversity of interests in the basin, and a Technical Advisory Committee (TAC) with members representing several agencies including land management and tribal representation.

The Public Advisory Committee met frequently during development of the plan to offer guidance and input to the plan's content.

Public Advisory Committee members are:

Rod Childers
Jim Coxen
John Ecklund (alternate)
Mac Huff
Bud Jones
Ed Miller
Rolly Paulson
Bob Schnell
Dave Schriner
Reed Stewert
Bob Weinburger

The Technical Advisory Committee includes the following representatives from Oregon and Washington state fishery agencies, other state natural resource agencies, Indian tribes, and federal agencies.

Oregon Department of Fish and Wildlife (ODFW)
- Steve Williams
- Duane West
- Jeff Zakel
- Brad Smith
- Bill Knox
- Richard Carmichael
- Ken Witty
- Jim Phelps
- Willie Noll

Oregon Department of Forestry (ODF)
- Garrett Rudisill

Oregon State Police (OSP)
- Bill Ables

Oregon State Water Resource Division (OWRD)
- Kent Searles

Oregon Department of Environmental Quality (DEQ)
- Debra Sturdevant

Washington Department of Fisheries (WDF)
- Robert Bugert
- Glen Mendel

Washington Department of Wildlife (WDW)
- Mark Schuck

Nez Perce Tribe
- Don Bryson

Confederated Tribes of the Umatilla Indian Reservation (CTUIR)
- Gary James

Bureau of Land Management (BLM)
- Dorothy Mason
- Matt Kniesel

U.S. Fish and Wildlife Service (USFWS)
- Larry Rasmussen

U.S. Forest Service (USFS)
- John Anderson

Bureau of Reclamation (BOR)
- Susan Broderick

This management plan for fish in the Grande Ronde River basin serves three purposes: 1. To record ongoing management; 2. To guide future directions that deviate from traditional or historical perspectives; and 3. To express public views of future fishery needs in the Grande Ronde River basin. This plan is not the final definitive statement of fish management in the Grande Ronde River basin. The plan will be reviewed every two years by ODFW and members of the public to evaluate progress in achieving its objectives, to modify the plan if necessary, and to set priorities for carrying out the plan for the following two years.

The scope of this plan is very broad. In addition to including species because of their potential for recreational and commercial fisheries, the plan also addresses lesser-known species that are a important part of the Grande Ronde River fauna, including some that may comprise the major food sources for the economically important species (Appendix B). Their well-being is important to the system as a whole, and they act as indicators of changes in the system. Mammals, birds, and amphibians, which interact with the rest of the system, are beyond the scope of this plan; however, their role in fisheries management will not be ignored.

Portions of the habitat, steelhead, and salmon sections of the plan were originally prepared as part of the Integrated System Plan for Salmon and Steelhead Production on the Columbia River Basin (ODFW 1990, Columbia Basin Fish and Wildlife Authority 1990). Those sections have been rewritten to fit ODFW's format for Fish Management River Basin Plans and to comply with the ODFW's Natural Production and Wild Fish Management policies (OAR 635-07-521 through 635-07-529).

Organization

The plan is divided into sections that discuss current management philosophy and direction, habitat, individual fish species, groups of species and angler access. Each section contains the following:

1. Background and status - historical and current information and an assessment of the current status of the species or topic.

2. Management Considerations - an explanation of alternative approaches with respect to the Wild Fish Management Policy.

3. Policies - overriding constraints or policies developed specifically for management activities in the basin relating to the species or topic.

4. Objectives - what is intended to be accomplished.

5. Assumptions and Rationale - justification and considerations used in arriving at the objective.

6. Actions - solutions or methods for attaining objectives

GENERAL CONSTRAINTS

The Grande Ronde River Basin Plan must conform to the statewide species plans and management policies and also conform to other established constraints such as federal acts (e.g., Wild and Scenic Rivers, Wilderness, Endangered Species), state statutes, memoranda of understanding, and other policies.

Legal Considerations

Federal Acts

Lower Snake River Water Resources Act of 1976 and the Lower Snake River Compensation Plan (LSRCP): The Fish and Wildlife Coordination Act, PL85-264, 85th Congress, 12 August 1958, requires the construction agency responsible for losses of fish and wildlife through construction of a project to compensate for those losses to the fullest extent possible. The four lower Snake River dams (Ice Harbor, Lower Monumental, Little Goose, and Lower Granite), constructed by the U.S. Army Corps of Engineers (USACE), impact natural migration of anadromous fish and certain aspects of their habitat. To fulfill the requirements of the Fish and Wildlife Coordination Act, the LSRCP was developed to compensate for the impacts of the four dams as a unit, rather than a dam-by-dam basis. Authority and background in development of the plan is detailed in a report submitted by the USACE (1975).

The LSRCP was initiated in 1976 to compensate for losses of spring and fall chinook salmon and summer steelhead in spawning areas, and sport and commercial fisheries. Mitigation of coho and sockeye salmon was not provided for under the plan. Mitigation of fall chinook salmon is limited to production at Lyons Ferry Hatchery (Washington) for the mainstem Snake River. Hatchery facilities were constructed in Oregon under the Lower Snake Compensation Plan to produce spring chinook salmon and summer steelhead for the Grande Ronde and Imnaha rivers. Construction and expansion of facilities for trapping, hatching, and rearing summer steelhead at Irrigon and Wallowa hatcheries was completed in 1986. An additional satellite facility for brood stock collection and acclimation and release of smolts was constructed on Deer Creek in the Wallowa River drainage (spring chinook salmon and summer steelhead).

Currently, hatchery programs under the LSRCP are still in developmental stages. The production and release programs are being monitored and evaluated. Adjustments will be made in rearing and release strategies to ensure that mitigation requirements are met and that long-term objectives of the LSRCP are achieved.

Oregon has been developing its compensation program under the LSRCP with the following long- term objectives.

A. Establish for each designated stock an annual supply of brood fish that can provide an egg-source capable of meeting compensation goals for spring chinook salmon and summer steelhead in the Grande Ronde and Imnaha systems.

B. Restore and maintain natural spawning populations of spring chinook salmon and summer steelhead in the Grande Ronde and Imnaha systems.

C. Re-establish sport fisheries and tribal fisheries for spring chinook salmon and summer steelhead in the mainstem Snake River and tributaries.

D. Establish a total return of adult spring chinook salmon and summer steelhead resulting from LSRCP activities in Oregon that meets the compensation goals for Oregon.

E. Maintain native stocks of wild spring chinook salmon and summer steelhead in the Minam and Wenaha rivers and Joseph Creek.

F. Minimize impacts of the program on resident fish stocks.

Wild and Scenic Rivers Act and Oregon State Scenic Waterways System: See disscussion in the habitat section.

Oregon State Laws

Senate Bill 140 (ORS 537.332 through 537.360) directed the Water Resources Commission to convert minimum stream flows into instream water rights following review. In 1989 the Oregon Fish and Wildlife Commission adopted administrative rules (OAR 635-400-000 through 635-400-040) regarding instream water rights. Minimum streamflows were adopted for locations in the Grand Ronde River basin. Although legislation does not guarantee the availability of these flows, it does give minimum flows priority over water rights obtained subsequently.

Oregon Senate Bill 2990 prohibits hydroelectric projects that would result in the mortality of a single anadromous fish. Its general impact has been to halt hydro development on anadromous fish streams.

The Oregon Forest Practices Act (Forest Practices Act) (ORS 527.610 to 527.730) was adopted in 1972. Commercial timber operations on state and private land are regulated by the act, which is administered by the Oregon Department of Forest management activities on U.S. Forest Service and Bureau of Land Management lands are designed to comply with Forest Practices Act rules and state water quality standards. The Forest Practices Act does not apply within the urban growth boundary of towns and cities.

The Oregon Removal-Fill Law requires a permit for the removal or filling of 50 cubic yards or more of material in natural waterways. The Division of State Lands oversees the program, reviews applications and issues permits, and enforces the law.

The Oregon Riparian Tax Incentive Program of 1981 provides a tax exemption to land owners for riparian lands included in a management plan developed by the land owner and ODFW personnel.

The Oregon Land Conservation and Development Commission had developed statewide planning goals. Goals that affect fishery resources include Goal 5, which addresses fish and wildlife areas and habitats, and Goal 6, which addresses water quality.

Oregon Senate Bill 523 of 1985 initiated a coordinated effort among state resource agencies for planning and management of the state's water resources.

ODFW goals and policies for commercial and sport fishing regulations, fish management, and salmon hatchery operation, including the Natural Production and Wild Fish Management policies, are adopted as Oregon Administrative Rules (OAR).

Agreements with other agencies and Tribes

The tribes, Oregon Department of Fish and Wildlife, and Washington Department of Fisheries have agreed that future management of harvest levels should be based on run size each year through co-management strategies. If a harvestable surplus becomes available, proposed harvest regulations must follow an established process before implementation. Oregon sport harvest regulations are set by the Oregon Fish and Wildlife biologists and input from the public. Washington sport regulations are set by the Washington Department of Fisheries, the Washington Department of Wildlife, and input from the public. The authority to set fishing seasons and establish other harvest management activities for Umatilla and Nez Perce tribal members is delegated to tribal fish and wildlife committees by the Tribal Wildlife Code. The tribal committees then accept public comment before finalizing regulations.

Each of the land and water management agencies in the basin has regulatory authority over some aspect of land or water use, or has overall responsibility for specific land or water areas. Each agency has its own policies, procedures, and management directives associated with its area of responsibility. No single agency has total jurisdiction over an entire river basin. For this reason, coordinated involvement and cooperation among fishery, land, and water managers is necessary to achieve comprehensive management of a watershed to the benefit of the entire system and its resources.

Memoranda of understanding among ODFW and the Bureau of Land Management (BLM), the U.S. Forest Service (USFS), and the USACE describe cooperative activities for protecting and improving fish habitat on federal lands. The BLM has entered into a memorandum of understanding with ODFW that says in part that the BLM agrees "to protect water quality and riparian areas by using appropriate bureau operational guidelines: e.g. buffer strips, proper road and culvert construction, bank stabilization methods, and other practices to minimize erosion from land management activities: (Memorandum of Understanding, Oregon Department of Fish and Wildlife - U.S. Bureau of Land Management 1981).

ODFW comments on USFS and BLM project proposals as well as the general land management plans. The plan review process provides a forum for the state to address habitat improvement or protection for fishery resources.

Contractual agreements exist with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) concerning Columbia River and ocean salmon fisheries, marine fish investigations, and hatchery production.

Annual contracts with the USACE have been established to mitigate for fish production lost as a result of USACE projects.

The Governor's Watershed Enhancement Board (GWEB) provides an opportunity for private individuals as well as organizations to become involved in watershed rehabilitation projects.

Policies

Development and implementation of the Grande Ronde River Basin Plan must follow state laws and guidelines listed below.

Policies by definition are overall rules to embrace goals and acceptable general procedures (OAR 635-07-501). Policies guide management activities by defining acceptable procedures. Policy statements appear in Oregon Revised Statutes (set by and only changeable by the Oregon Legislature), Oregon Administrative Rules (interpretation or definition of statutes by the Oregon Fish and Wildlife Commission), or as ODFW internal administrative policies. The Grande Ronde Basin Plan must conform to the following established constraints:

1. Legislation - Oregon Revised Statute (ORS). These statutes include the following wildlife policy (ORS 496.0122):

   "It is the policy of the State of Oregon that wildlife shall be managed to provide the optimum recreational and aesthetic benefits for present and future generations of the citizens of this state. In furtherance of this policy the goals of wildlife management are:

   a. To maintain all species of wildlife at optimum levels and prevent the serious depletion of any indigenous species.

   b. To develop and manage the lands and waters of this state in a manner that will enhance the production and public enjoyment of wildlife.

   c. To develop and maintain public access to the lands and waters of the state and the wildlife resources thereon.

   d. To regulate wildlife populations and the public enjoyment of wildlife in a manner that is compatible with primary uses of the lands and waters of the state and provides optimum public recreational benefit."

2. Oregon Administrative Rules (OAR); goals and policies for commercial and sport fishing regulations, fish management, and salmon hatchery operation, including the Wild Fish Management Policy. Portions of the Grande Ronde Basin Plan will also be adopted as OAR's.

3. Procedures developed by Oregon Department of Fish and Wildlife; Manual for Fish Management (1977), A Department Guide for Introductions and Transfers of Finfish into Oregon Waters (1982).

4. Agreements with other agencies -- e.g., U.S. Bureau of Land Management (BLM), U.S. Forest Service (USFS), and U.S. Army Corps of Engineers (USACE).

5. Rules and Regulations of Other State and Federal Jurisdictions -- e.g., Department of Environmental Quality (DEQ), Department of Forestry (ODF), the Department of Land Conservation and Development (DLCD), and the Federal Threatened and Endangered Species Act.

6. Oregon Department of Fish and Wildlife statewide species plans. Species plans that have been adopted by Oregon's Fish and Wildlife Commission are the Steelhead Plan, Trout Plan, and Warmwater Game Fish Plan. These statewide plans are consistent with Oregon's policies for fish management, and were developed as part of Oregon Department of Fish and Wildlife's planning program to provide a comprehensive, systematic, and long-term approach to management of the fish species in Oregon. They act in conjunction with the Natural Production and Wild Fish Management Policies. The above plans contain goals for production and management, guidelines, and objectives at the statewide level. Oregon's fish resources must be managed on a stock basis due to the diverse nature of fish species in the state. Therefore the species plans act as umbrella documents that provide direction for developing more specific river basin management plans.

IMPLEMENTATION AND REVIEW

The Grande Ronde River Plan should not be viewed as the final statement on management of the fish and fisheries in the basin. Planning is a continuing process. This plan is intended to provide both long-term and short-term direction for management of the fisheries in the Grande Ronde River basin. As conditions of the resources and desires of the public change and as new information is obtained, the plan must be responsive and evolve as well. Portions of the plan will be rewritten as needed and presented to a public advisory committee. The final draft will be presented to the Fish and Wildlife Commission to review progress made in implementing the plan. These meetings are intended to provide an opportunity for the public to comment on management direction and progress. This review will precede the preparation of ODFW's biennial budget, which is submitted to the legislature for funding.

Upon adoption by the Oregon Fish and Wildlife Commission, the policies and objectives will become Oregon Administrative Rules. Revision of these rules requires action by the Commission. The entire plan, including policies and objectives, will be formally reviewed and revised every 10 years. Emergency changes in administrative rules can be made by the Commission in accordance with the Administrative Procedures Act when needed.

Progress made implementing the actions in the plan will be reported by the Department every 2 years. At that time implementation priorities will also be reexamined and adjustments made where necessary.

FALL CHINOOK SALMON

Background and Status

Origin

Fall chinook salmon are indigenous to the Grande Ronde River basin and were historically distributed throughout the lower part of the river system (Appendix A. Figure 1). Currently only a few fish spawn in the Grande Ronde River basin, primarily below the Wenaha River. The current low spawning escapement is attributed to passage mortality at Columbia and Snake river dams, harvest, and habitat degradation within the basin.

Historical documentation suggests the indigenous Grande Ronde River fall chinook salmon population spawned well into the Wallowa River drainage during October. Currently, only occasional reports of salmon spawning during this time period occur. Although the exact status of this population is unknown, there appears to be at most a few individuals returning to the Grande Ronde River each year.

Recently fall chinook salmon have been observed spawning in the lower 45 miles of the Grand Ronde River during November. Timing and distribution of these sightings suggest these fish are most likely a segment of the Snake River fall chinook salmon population and may not be related to the historic Grande Ronde population. Dam counts document the general decline in fall chinook salmon spawning escapement throughout the Lower Snake River basin since 1965 (Appendix A. Table 1).

Figure 2 (Appendix A.) shows the decline in relationship to the construction of the four Snake River dams. In addition, aerial surveys of the Snake River since 1969 have recorded few fall chinook salmon or redds (Appendix A. Table 2). Spawning surveys conducted in the lower 37 miles of the Grande Ronde River (below the mouth of the Wenaha River) since 1986 resulted in few redds being located (Appendix A. Table 3).

Life History and Population Characteristics

Natural Production: Life history information on Grande Ronde River fall chinook salmon is very limited. In 1957 freshly spawned carcasses were found on October 28 and November 1. Redds and carcasses were observed on the Minam River on September 22 and October 1, 1958 (Thompson and Haas 1960). In October of 1988 a salmon was observed spawning in the Minam River (pers. comun. Jeff Zakel, ODFW, 1991). No other information on adult population characteristics or juvenile life history is available.

Hatchery production: The first attempts to culture fall chinook salmon occurred in the early 1900's when racks were placed on the mainstem Grande Ronde River and on the Wallowa River. No late returning or spawning fall chinook salmon were observed during the early 1900's, and all fish were spawned from mid-September to late October (Cramer 1990).

In response to declining returns of fall chinook salmon in the Snake River an egg-bank program was begun in 1977 in an attempt to preserve Snake River stocks. The purpose of the program was to establish a hatchery run of "bright" fall chinook salmon in the Snake River by artificial methods until fish passage could be improved at Lower Snake River dams. Adult fish were collected until 1984 at Ice Harbor dam and transferred to either Tucannon or Dworshak hatcheries for spawning. Eggs were shipped to Klickitat, Hagerman, and Kalama Falls hatcheries to provide for subsequent brook stock. Excess smolts were released into the Snake River near the Grande Ronde River. Starting in 1984, adults collected at Ice harbor Dam were transferred to the newly constructed Lyons Ferry hatchery for spawning and rearing of progeny to establish a hatchery fall chinook salmon run to that facility. This program is continuing and is being evaluated for potential outplanting strategies. Outplanting fall chinook salmon in the Grande Ronde River basin is a possible alternative, but no plans for such a program currently exist (R. Bugert, WDF, Lyons Ferry, pers. comun.).

The Lyons Ferry fall chinook salmon stock was developed as a lower Snake River hatchery stock to perpetuate and enhance natural production. This stock may not be most suitable for a supplementation program in the Grande Ronde River because run timing and spawning timing appear to be much later than that of the historic Grande Ronde River basin fall spawning chinook salmon. A stock similar to the Wenatchee River late summer chinook salmon appears to be the most suitable for reintroduction.

Angling and Harvest

The Grande Ronde River basin is within ceded lands of the Umatilla and Nez Perce tribes. Rights to tribal subsistence fisheries are secured by treaties. Any harvestable surplus of fall chinook salmon in the basin will be allocated equally between sport and tribal fisheries (50 percent of harvestable returns will be available to each fishery).

Regulations: Harvest of fall chinook salmon is not currently allowed in the Grande Ronde River basin due to low escapement levels.

Management Considerations

Major Management Problems and Issues

Low fall stream flow limits the distribution of spawning fall chinook salmon within the Grande Ronde River basin. Winter ice scouring and sedimentation appear to limit fall chinook salmon egg-to-fry survival. Riparian and instream habitat restoration in higher reaches of the basin aimed primarily at other species are expected to provide some benefit to fall chinook salmon production through reduction in sediment transport. Other upper basin activities such as timber harvest and agriculture leads to soil erosion and sedimentation.

If there are any Grande Ronde River fall chinook salmon left harvest on mixed stock fisheries in the ocean and Columbia River will impact production. Management activities which address this problem are limited by international and tribal treaties and court decisions.

The Snake River fall chinook salmon have been have been classified as an threatened species under the federal Endangered Species Act. This listing may remove management authority for the species from the state. With the above considerations, development of alternatives was limited in scope to those actions realistically expected to be within the authority of the ODFW.

Information Needs

1. Impacts of out-of-system management plans and harvest strategies on Grande Ronde River fall chinook salmon.

2. Age and timing of juvenile outmigration, survival rates of each life history stage, and sex ratio, age, and timing of returning spawners.

3. Method and ability to enumerate spawning escapement to the mouth of the Grande Ronde River.

4. Information regarding factors limiting egg-to-fry survival within the Grande Ronde River basin.

5. Estimate of the basin's natural production potential.

6. Estimates of current escapement of October spawning chinook salmon, if any.

7. Availability of suitable stocks for reintroduction, if any exist.

Management Alternatives

In this section we examine two management alternatives to achieve compliance with the Wild Fish Management Policy. Alternative 1 calls for no hatchery influence and relies entirely on natural production and improvement in watershed health to meet fishery needs. Alternative 2 investigates the potential of a hatchery program in the future.

ALTERNATIVE 1

Policy 1. **Fall chinook salmon in the Grande Ronde River basin shall be managed for wild fish only.**

Objective 1. **Enhance production of the existing wild fall chinook salmon population(s) in the Grande Ronde River system.**

Assumptions and Rationale

1. Due to the extremely low wild population level of fall chinook salmon, this alternative may not result in recovery.

2. Columbia and Snake river fish passage will improve, but will continue to affect fall chinook salmon survival.

3. Harvest in ocean and Columbia River mixed stock fisheries will continue to limit fall chinook salmon spawning escapement.

4. Maintenance of natural production under the constraints of the Wild Fish Management Policy aide in the protection of genetic diversity within the existing Grande Ronde River fall chinook salmon population.

5. Estimates of run size obtained from spawning ground and dam counts are reasonably accurate.

6. Fall chinook salmon habitat in the Grande Ronde River basin is under-seeded.

7. Production capability of the Grande Ronde River for fall chinook salmon will remain at or above its current level.

8. Low fall stream flow, winter icing, scouring, and sedimentation limit egg-to-fry survival.

9. Snake River fall chinook salmon, including the Grande Ronde River segment of that population, will be listed as a threatened or endangered species under the Endangered Species Act.

10. Management of fall chinook salmon in the Snake River basin will be determined by a recovery plan under The Endangered Species Act and will require coordination with the Nez Perce and Umatilla Tribes, ODFW, WDF, IDFG, NMFS, and USFWS.

11. Investigations and planning currently underway as part of the Northeast Oregon Hatchery Program resulted in development of strategies and goals which may or may not be appropriate under the constraints implemented by The Endangered Species Act.

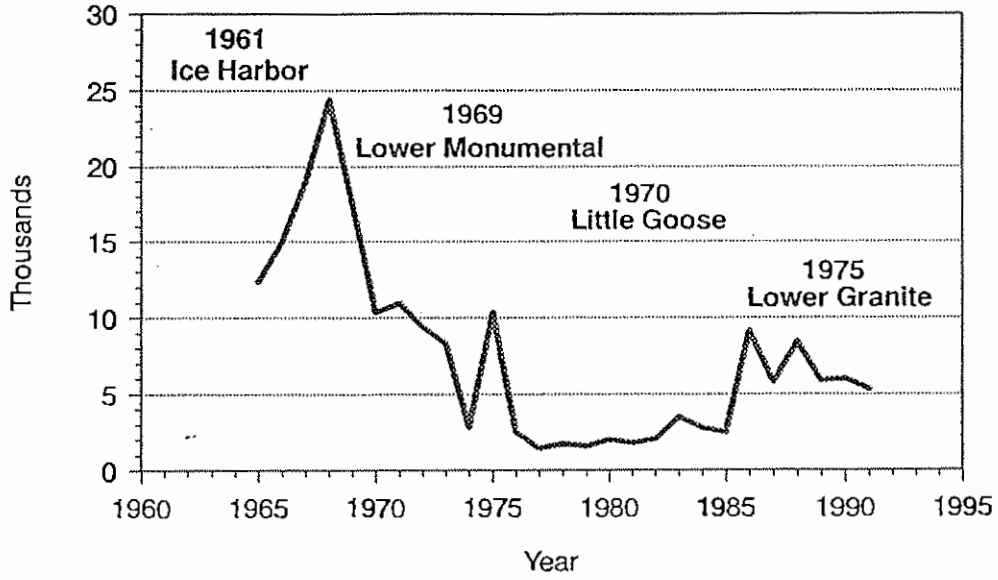

Figure 2. Fall chinook salmon (adults and jacks combined) counts at Ice Harbor dam on the Snake River from 1965 to 1991.

Table 2. Number of adult fall chinook salmon and redds (in parentheses) observed on spawning ground surveys in the middle Snake River between 1969 and 1986 (Whitty 1976, 1986, and 1987). Other years in this period were not surveyed due to high water conditions or aircraft problems.

Section	1969	1974	1975	1976	1987
Hells Canyon Dam to Johnson Bar	137 (170)	0 (1)	a	1 (8)	0 (13)
Johnson Bar to Pleasant Valley	81 (124)	2 (10)	a	0 (1)	0 (6)
Pleasant Valley to Appaloosa	38 (61)	0 (3)	a	0 (0)	0 (5)
Appaloosa to Mountain Sheep	27 (33)	0 (2)	a	5 (4)	0 (5)
TOTAL	283 (388)	2 (16)	11 (10	6 (13)	0 (29)

a. Information by section is not available

Table 3. Washington Department of Fisheries Grande Ronde River fall chinook salmon spawning ground survey counts from 1986-90[a] (pers. comun. Glen Mendel, WDF, 1991).

Year	Number of surveys	Number of Carcasses	Number of Live Fish	Number of Redds
1986	1 (Nov)	0	0	0
1987	2 (Nov)	2	2	7
1988	1 (Nov) 1 (Dec)	0	0	1
1989	1 (Nov) 1 (Dec)	0	0	0
1990[b]	1 (Dec)	0	0	1
1991	2 (Oct) 1 (Nov)	0	0	0

a. *The Lower Grande Ronde River to the mouth of the Wenaha River has been surveyed (when conditions allow) during Snake River spawning ground survey counts.*

b. *Un-surveyable in November due to high water conditions.*

Table 3. Washington Department of Fisheries Grande Ronde River fall chinook salmon spawning ground survey counts from 1986-90[a] (pers. comun. Glen Mendel, WDF, 1991).

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a. *The Lower Grande Ronde River to the mouth of the Wenaha River has been surveyed (when conditions allow) during Snake River spawning ground survey counts.*

b. *Un-surveyable in November due to high water conditions.*

COHO SALMON

Background and Status

Historically, the Grande Ronde River basin was the major production area for coho salmon in the Snake River basin, and was the farthest upstream river system used by coho salmon in the Columbia River basin (Fulton 1970, Thompson and Haas 1960). Lower Snake River dam counts document the decline in coho salmon abundance in the Snake River basin (Appendix A Table 1). Spawning ground survey counts in index areas of the Wallowa River drainage through 1980 show declining numbers of coho salmon returning to the basin. Declines were also documented by numbers of downstream migrating juveniles trapped at rotary screen water diversion bypasses. Trap records show dramatic declines in coho salmon juvenile migrants after 1978 in the Lostine and Wallowa rivers, and Hurricane and Bear creeks (Appendix A Table 2). The decline in coho salmon numbers is attributed to passage mortality at Columbia and Snake river dams, overharvest in mainstem and ocean fisheries, and habitat degradation within historic spawning and rearing areas of the basin (Witty 1984). Migration patterns for Grande Ronde River basin coho salmon may have been different than lower Columbia River stocks in Oregon, therefore harvest may have been different. Since 1986, coho salmon have been extinct in the Grande Ronde River basin (as well as the Snake River basin), as indicated by zero counts at Snake River dams.

Life History and Population Characteristics

Natural Production: Coho salmon spawn in October, fry emerge in late March and early April, and smolts migrate out of the basin in May after approximately one year of freshwater rearing. In the lower Grande Ronde River, a pre-smolt out-migration during October was documented. It is not known whether pre-smolts may have reared during winter in the Snake River before migration to the Columbia River in the spring.

Distribution: Historical distribution of coho salmon is known to include the lower Grande Ronde, Wenaha, and Wallowa river drainages, and Catherine Creek (Parkhurst 1950, Thompson and Haas 1960). In 1953, coho salmon juveniles were collected in Catherine Creek. Surveys in 1957 documented coho salmon spawning in the Wallowa River from two to four and one half miles downstream of Joseph, and the lower five miles of the Lostine River. Smith (1975) reported coho salmon spawning in Hurricane, Prairie, Spring, and Bear creeks (Wallowa River), and the Lostine River.

Production constraints: Although loss of Grande Ronde River coho salmon is attributed primarily to overharvest and passage problems at mainstem Columbia and Snake river dams, factors within the Grande Ronde River basin have also contributed. Habitat degradation, water temperatures at time of passage, and severely reduced streamflows due to agricultural use has occurred in historic spawning and rearing areas. These factors remain as potential constraints to re-establishment of coho salmon.

Hatchery production: In 1983 and 1984, a plan to sustain and restore coho salmon returning to the Grande Ronde River basin was implemented, but did not succeed. The plan was to collect adult coho salmon at Ice Harbor Dam on the lower Snake River, spawn the

adults, and rear and release the juveniles at Wallowa Hatchery. In 1983 only one adult coho salmon was trapped, although counts at the Ice Harbor Dam south shore ladder showed 220 coho salmon passed the dam. (The discrepancy between trap count and ladder count may be attributed to the possibility that: 1. Coho salmon did not enter the trap during the period of operation, 2. Coho salmon were misidentified by personnel counting at the ladder or operating the trap, or 3. All coho salmon were less than 25 inches long and not adipose-fin clipped, resulting in them being counted as adults in the ladder but then misidentified by trap operators and allowed to pass). Actions were taken in 1984 to correct potential trapping problems, but only one adult coho salmon was trapped. In both years, coho salmon counts were very low at all of the lower Snake River dams, indicating few fish were available to implement a restoration program.

The only Columbia River hatchery stocks available to re-establish runs in the Grande Ronde River basin are lower Columbia River hatchery stocks. The suitability of these stocks for upriver coho salmon production is unknown.

Under the Lower Snake River Compensation Plan, there are no mitigation requirements for re-establishment of coho salmon to the Snake River basin. No production or harvest agreements for upriver coho salmon exist between the states or tribes.

Release Numbers: In 1964, 897 hatchery coho salmon adults from Oxbow Hatchery were released at three sites in the Wallowa River drainage. That same year 1,129 coho salmon adults from Tanner Creek Hatchery were released in the upper Grande Ronde River. In 1966 375,320 fingerling coho salmon of unknown origin were released in Spring Creek in Union County. These were the only releases of hatchery coho salmon in the Grande Ronde River basin. No hatchery production of coho salmon occurs in the Snake River basin.

Angling and Harvest

Catch-card data for sport-caught salmon in the Grande Ronde River basin from 1969 to 1974 are summarized in Appendix A Table. Fish caught from September through November are assumed to be primarily coho salmon. Sport catch for this period was low and followed a declining trend, falling to a total catch of 14 fish in 1974. The Grande Ronde River was closed to salmon angling after 1974.

Management Considerations

Major Management Problems and Issues

Harvest of upriver coho salmon stocks in mixed-stock ocean and mainstem Columbia River fisheries is a major constraint to re-establishing a coho salmon run in the Grande Ronde River basin. Columbia and Snake River dams and reservoirs continue to provide major barriers to both adult and juvenile passage. Within the basin, habitat degradation has decreased the production capacity of historic rearing areas by 20 to 70 percent. Natural low streamflows and irrigation water withdrawals reduce streamflows in some spawning areas and limit access during the fall spawning migration period. No Snake River coho salmon stocks remain to stray into the Grande Ronde River basin and spawn naturally.

Information Needs

Prior to proposing specific objectives and actions to reintroduce coho salmon to the Grande Ronde River basin, the feasibility of achieving the objective must be evaluated.

1. Factors that lead to extirpation of coho salmon from the Grande Ronde River basin must be determined.

2. Habitat and harvest constraints for coho salmon in the Grande Ronde River basin (mainstem and tributary passage, spawning and rearing habitat, and ocean and mainstem exploitation rates) must be determined.

3. Natural production capacity, including quantity and quality of existing spawning and rearing habitat in areas historically used by coho salmon, and potential migration barriers that may limit access to spawning areas are unknown and must be determined.

4. Impacts of reintroduction of coho salmon on existing populations of resident and anadromous fishes and fisheries are unknown.

5. The availability and suitability of potential brood stocks needs to be determined. Suitability of a stock would be based on juvenile and adult life history characteristics, susceptibility to ocean and Columbia River fisheries, and availability of eggs or fry.

Management Alternative

The following alternative calls for habitat enhancement and improvements in watershed health in conjunction with investigation of the potential, in the future, of a hatchery program to reintroduce coho salmon to the Grande Ronde River basin. Our intent with the direction of this plan is to enhance spawning areas and increase the amount of habitat for reintroduced coho salmon. We would seek to conduct this work in stream areas accessible and suitable for production of coho salmon.

Policies

Policy 1. Attempt to reintroduce coho salmon with a hatchery stock similar to that historically present in the Grande Ronde River basin if the habitat is suitable and there are no unacceptable impacts on threatened or endangered species.

Objectives

Objective 1. Re-establish coho salmon adult spawning numbers to 1,000 in the Grande Ronde River basin.

Assumptions and Rationale

1. Coho salmon were native to the Grande Ronde River basin, but are now extinct throughout the Snake River basin.

2. The majority of Columbia River hatchery stocks available to re-establish coho salmon runs in the Grande Ronde River basin are lower Columbia River hatchery stocks. There may be some upper river stocks available i.e., Wenatchee River stock. The suitability of these stocks for upriver coho salmon production is unknown.

3. Harvest in ocean and Columbia River mixed stock fisheries will continue to limit coho salmon spawning escapement.

4. Columbia and Snake river fish passage will improve, but will continue to affect coho salmon survival.

5. Low fall stream flow, winter icing, scouring, and sedimentation limit egg-to-fry survival.

6. Under the Lower Snake River Compensation Plan, there are no mitigation requirements for re-establishment of coho salmon to the Snake River basin. No production or harvest agreements for upriver coho salmon exist between the states or tribes.

7. ODFW will continue to work with Washington, Idaho, and Tribes to achieve mutual goals and objectives.

8. Escapement of wild fish will not increase until changes in the Columbia Basin Fish Management Plan allows for a greater escapement of wild coho salmon over Lower Granite Dam.

Actions

Action 1.1 Document the factors that lead to the extinction of coho salmon in the Grande Ronde River basin.

Action 1.2 Initiate a genetic risk study to determine the potential impacts of coho salmon reintroduction and supplementation programs on all existing fish populations in the Grande Ronde River system. Describe how coho salmon can cause genetic risks to other species.

Action 1.3 Based on current information investigate the suitability of Columbia River hatchery stocks available to re-establish coho salmon runs in the Grande Ronde River basin.

Action 1.4 Implement measures, through coordination with other states and tribes, to protect Grande Ronde River coho salmon from over-harvest in ocean and Columbia River mixed-stock fisheries if successfully reintroduced.

Action 1.5 Maintain an effective enforcement program capable of protecting spawning coho salmon.

Objective 2. Provide angling opportunities in the future for coho salmon in the Grande Ronde River basin.

Assumptions and Rationale

1. Provide angling opportunities including non-consumptive as well as consumptive use of coho salmon.

2. Special regulations may be necessary to protect stock fitness, life history characteristics, and to maintain healthy coho salmon populations.

Actions

Action 2.1 Implement a cooperative enforcement program with OSP to insure compliance with regulations.

Action 2.2 Maintain enforcement of angling regulations at a level that insures protection of coho salmon populations and an equitable use of the resource.

Appendix A

Table 1. Counts of adult and jack coho salmon at four lower Snake River dams, 1962-1990.

Year	Ice Harbor		Lower Monumental		Little Goose		Lower Granite	
	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks
1962	3,207[a]							
1963	1,933[a]							
1964	2,071[a]							
1965	320[a]							
1966	880[a]							
1967	2,000	1,800						
1968	3,800	2,400						
1969	2,300	3,000	4,000	2,500				
1970	1,800	1,900	1,600	1,300	1,200	1,300		
1971	1,600	1,300	1,400	760	1,700	960		
1972	1,400	1,100	490	240	520	280		
1973	1,300	1,200	860	470	770	380		
1974	580	760	520	290	280	240		
1975	710	850	320	250	400	300	440	470
1976	840	1,200	210	150	320	410	440	460
1977	230	1,300	40	80	110	330	50	220
1978	160	490	90	130	150	160	25	125
1979	130	270	120	80	210	190	50	110
1980	50	8	60	10	90	35	30	13
1981	25	60	19	45	8	110	1	16
1982	160	190	47	37	*b*	*b*	31	28
1983	220	240	66	45			25	26
1984	17	5	23	3			0	0
1985	8	2	21	3			2	0
1986	0	0	2	7			1	0
1987	0	0	0	6			0	0
1988	0	0	2	1			0	0
1989	0	0	3	14			0	0
1990	1	0	1	0			0	0

[a] Differential counts were not conducted for these years.

[b] After 1981, counts at Little Goose dam were not differentiated by species.

Table 2. Juvenile coho salmon trapped at rotary screen bypass trap boxes, ODFW Wallowa District. The time period of record and number of trap boxes operated each year was variable.

Year	Number[a] trapped
1966	9,324
1967	4,122
1968	15,464
1969	5,308
1970	5,355
1971	2,415
1972	7,443
1973	17,279
1974	2,737
1975	3,417
1976	1,797
1977	5,880
1978	2,292
1979	22
1980	2
1981	5
1982	14
1983	1
1984	6
1985	95
1986	37
1987	3
1988	0
1989	0
1990	0
1991	0

a. *Prior to 1990 emphasis was not placed on keying out the different salmonid species*

Table 3. Number of coho salmon harvested in the Grande Ronde River basin sport fishery from catch-card returns for 1969 through 1974 (Oregon Department of Fish and Wildlife).

Year	Water body	Sept	Oct	Nov	Subtotal
1969	Catherine Creek	8	0	21	29
	Grande Ronde River	42	71	0	113
	Minam River	4	0	0	4
	Wallowa River	4	0	0	4
	Total				150
1970	Catherine Creek	0	0	0	0
	Grande Ronde River	33	56	5	94
	Minam River	0	5	5	10
	Wallowa River	0	19	0	19
	Total				123
1971	Catherine Creek	0	1	0	5
	Grande Ronde River	0	23	0	23
	Minam River	0	5	0	5
	Wallowa River	9	14	0	23
	Total				56
1972	Catherine Creek				
	Grande Ronde River				
	Minam River			No harvest	
	Wallowa River				
	Total				
1973	Catherine Creek	0	0	0	0
	Grande Ronde River	18	35	0	53
	Minam River	--	7	0	7
	Wallowa River	4	11	0	15
	Total				75
1974	Catherine Creek	0	0	0	0
	Grande Ronde River	0	0	3	3
	Minam River	0	0	0	0
	Wallowa River	0	0	11	11
	Total				14

SOCKEYE SALMON

Background and Status

Sockeye salmon (*Oncorhynchus nerka*) historically occurred in the Grande Ronde River basin. Production within the basin occurred exclusively in the Wallowa River drainage and originated at Wallowa Lake. Sockeye salmon were extirpated from the basin in the early 1900's.

Although sockeye salmon are currently considered extinct in the basin, the genetic component of the population may still be present in wild kokanee of Wallowa Lake, the kokanee may have just suppressed their anadromous component.

Unscreened diversions for irrigation purposes and overharvest drove the sockeye salmon to near-extinction by 1904. The Oregon Department of Fisheries culture program for sockeye salmon was another factor in the demise of this species. In an attempt to capture adult sockeye salmon, fish racks were placed across the Grande Ronde River near Troy in late 1901, but the fish had already moved upriver. In 1902 the Grande Ronde River was racked approximately 2000 feet above the confluence of the Wenaha River. No fish entered Wallowa Lake that year. The next year racks were placed across the Wallowa River just below the confluence of the Minam River, again physically blocking fish passage up-river (Cramer 1990).

In 1906 construction of the 14 foot high Wallowa River Hatchery dam 43 miles below Wallowa Lake completely blocked adult sockeye salmon passage. In 1916 the dam at the outflow of Wallowa Lake was heightened to 18 feet, permanently preventing passage of sockeye salmon to the spawning grounds in Wallowa Lake and River.

Life History and Population Characteristics

Populations historically and currently present: Sockeye salmon are extinct in the Grande Ronde River basin and are listed as a federally endangered species in the Snake River by the National Marine Fisheries Service (NMFS) (Table 1 Appendix A).

Natural Production: Sockeye salmon spawn in rivers that have lakes in the system. Sockeye salmon usually spend two years in the ocean (few spend one or three years in the ocean). Historic sockeye salmon adult production levels are unknown, however the number is assumed to be large as indicated by the presence of two sockeye salmon canneries at Wallowa Lake in the 1890s.

Migration: Sockeye salmon migrated through the lower and middle Grande Ronde River from late June to late July and entered the Wallowa River from mid-October to mid-November.

Time and Location of Spawning: Fish spawned from mid-October to mid-November (Van Dusen 1903, 1905). Spawning primarily occurred in the Wallowa River above Wallowa Lake. Juveniles probably reared in Wallowa Lake for two or three years before smolting and

beginning seaward migration, similar to sockeye salmon in Red Fish Lake, Idaho. A natural population of kokanee salmon (landlocked sockeye salmon) currently exists in Wallowa Lake (see Resident Trout section).

Hatchery production: The first attempt to culture sockeye salmon in the Grande Ronde River basin occurred in 1902 when racks were placed across the Grande Ronde River. near Troy. During this operation 2,511 female sockeye salmon were collected and spawned (Van Dusen 1903) and 8.65 million sockeye salmon eggs were taken. There was no indication of success for either egg or juvenile plantings because eggs and juveniles were planted into the river well below Wallowa Lake. The last sockeye salmon were observed in 1917.

There are no mitigation requirements for sockeye salmon or production or harvest agreements for Snake River sockeye salmon between states or tribes. Hatchery kokanee stocking in Wallowa Lake could affect wild kokanee which may be all that is left of sockeye salmon "genetic material" (see Resident Trout section).

Angling and Harvest

No harvest estimates for Grande Ronde River basin sockeye salmon are available, however, ceremonial and subsistence tribal fisheries and commercial harvest at Wallowa Lake occurred historically. There has been a mixed-stock target fishery on sockeye salmon in the Columbia River until very recently. No commercial harvest (including tribal) has occurred since 1988.

Management Considerations

Major Management Problems and Issues

Harvest of upriver sockeye salmon stocks in mixed-stock ocean and mainstem Columbia River fisheries is a major constraint to re-establishing a sockeye salmon run in the Grande Ronde River basin. Columbia and Snake river dams and reservoirs continue to provide major barriers to both adult and juvenile passage. Within the basin, habitat degradation has decreased the amount of historic spawning areas. Natural low streamflows and irrigation water withdrawals reduce streamflows and limit access during the fall spawning migration period. Wallowa Lake dam remains a passage barrier, and water temperatures currently existing in the lower Grande Ronde River may preclude migration through that reach during summer months. Very few Snake River sockeye salmon stocks remain to stray into the Grande Ronde River basin and spawn naturally.

Information Needs

Prior to proposing specific objectives and actions to reintroduce sockeye salmon to the Grande Ronde River basin, the feasibility of achieving the objective must be evaluated.

1. Habitat and harvest constraints (mainstem and tributary passage, spawning and rearing habitat, ocean and mainstem exploitation rates).

2. Natural production capacity, including quantity and quality of existing spawning and rearing habitat in areas historically used by sockeye salmon, and potential migration barriers that may limit access to spawning areas.

3. Impacts of reintroduction on existing populations of resident and anadromous fishes and fisheries.

4. Availability and suitability of potential brood stocks. Suitability of a stock would be based on juvenile and adult life history characteristics, susceptibility to ocean and Columbia River fisheries, and availability of eggs or fry.

Management Alternative

The only alternative presented calls for habitat enhancement and improvements in watershed health in conjunction with investigating the potential, in the future, of a hatchery program to reintroduce sockeye salmon to the Grande Ronde River basin. Our intent is to maintain the quality of spawning and rearing areas in Wallowa Lake and River. The Department would seek to conduct this work in all areas suitable for production of sockeye salmon. there may be a need to enhance these areas if the decision to reintroduce sockeye salmon is made.

Policies

Policy 1. **Programs protecting and enhancing threatened and endangered populations currently utilizing the Grande Ronde River drainage shall be given the priority in funding over reintroduction of extinct species.**

Policy 2. **Protection of existing kokanee production areas from alterations which reduce potential for future sockeye salmon introduction shall be given high priority.**

Objectives

Objective 1. **Determine the feasibility, costs, and risks of reintroducing sockeye salmon to Wallowa Lake.**

Assumptions and Rationale

1. Sockeye salmon were native to the Grande Ronde River basin, but are now extinct throughout the Grande Ronde River basin.

2. The majority of Columbia River and Snake River hatchery stocks available to re-establish sockeye salmon runs in the Grande Ronde River basin are lower

Columbia hatchery stocks. There may be some upper river stocks available. The suitability of these stocks for upriver sockeye salmon production is unknown. The Wenatchee population of sockeye salmon spawns from mid-September to mid-October and the Okanogan population spawns in October. Wild Wallowa Lake kokanee and "recovered" Red Fish Lake sockeye salmon are also options to consider.

3. Harvest in ocean and Columbia River mixed-stock fisheries will continue to limit sockeye salmon spawning escapement. Ocean harvest on Columbia River sockeye salmon is negligible (ODFW 1990); in-river harvest is no longer a constraint.

4. Columbia and Snake river fish passage will improve, but will continue to affect sockeye salmon survival.

5. Low fall stream flow, winter icing, scouring, and sedimentation limit egg-to-fry survival.

6. Under the Lower Snake River Compensation Plan, there are no mitigation requirements for re-establishment of sockeye salmon to the Grande Ronde River basin. No production or harvest agreements for upriver sockeye salmon exist between the states or tribes.

7. ODFW will continue to work with Washington, Idaho, and Tribes to achieve mutual goals and objectives.

8. Escapement of wild fish will not increase until changes in the Columbia Basin Fish Management Plan allows for a greater escapement of wild sockeye salmon over Lower Granite Dam.

Actions

Action 1.1 Identify appropriate sockeye salmon hatchery stock, similar to that historically present, for reintroduction to the Grande Ronde River basin.

Action 1.2 Monitor Red Fish Lake genetic studies and recovery through artificial propagation to guide potential recovery of Wallowa Lake sockeye salmon, possibly from Wallowa Lake kokanee.

Action 1.3 Assess existing data and gather new data on possibility of downstream migrants out of Wallowa Lake and their genetic relationship to wild kokanee in the lake.

Action 1.4 Implement measures, through coordination with other states and tribes, to protect Grande Ronde River sockeye salmon from over-harvest in Columbia River mixed-stock fisheries if successfully reintroduced.

Action 1.5 Document the current potential for sockeye salmon spawning in Wallowa Lake and river above the lake.

Action 1.6 Determine the feasibility and cost associated with providing passage at Wallowa Lake dam and screening of unscreened ditches below the lake.

Action 1.7 Initiate a risk study to determine the potential impacts of sockeye salmon reintroduction and supplementation programs on existing fish populations in the Grande Ronde River system.

Objective 2. Maintain options for future introduction of sockeye salmon to Wallowa Lake.

Assumptions and Rationale

1. Potential sockeye salmon spawning areas are limited.

Actions

Action 2.1 Implement measures to insure protection of all suitable donor stocks identified in Action 1.1.

Action 2.2 Develop a plan in cooperation with state parks and other local land owners to insure the maintenance and enhancement of potential sockeye salmon spawning areas above Wallow Lake.

APPENDIX A

Table 1. Counts of adult sockeye salmon at four lower Snake River dams, 1962-91.

Year	Ice Harbor Adults	Lower Monumental Adults	Little Goose Adults	Lower Granite Adults
1962	38			
1963	1,118			
1964	1,276			
1965	317			
1966	278			
1967	717			
1968	1,165			
1969	745	1,127		
1970	797	240	163	
1971	532	808	891	
1972	363	415	408	
1973	233	206	192	
1974	204	114	124	
1975	243	146	173	209
1976	771	364	644	531
1977	582	293	574	458
1978	86	96	168	123
1979	30	31	72	25
1980	36	48	88	96
1981	142	136	200	218
1982	174	122	[a]	211
1983	216	118		122
1984	105	63		49
1985	24	68		35
1986	20	26		15
1987	13	16		29
1988	22	35		23
1989	4	9		2
1990	1	0		0
1991	9	6		8

[a] *After 1981, counts at Little Goose dam were not differentiated by species.*

SUMMER STEELHEAD

Background and Status

Origin

Summer steelhead (*Oncorhynchus mykiss*) are native to the Grande Ronde River basin. The Grande Ronde River basin historically produced large runs of summer steelhead. Historic run sizes are unknown, but an estimate of 15,900 to the mouth of the Grande Ronde River was given for 1963 prior to construction of Snake River dams (USACE 1975).

Summer steelhead are currently produced in the Grand Ronde River basin by wild populations and a hatchery program. The average redd density for the years 1985 through 1992 is substantially higher than for the years 1968 through 1984 (Figure 1 and Appendix A Table 1). In 1991 in Wallowa County, the number of redds per mile dropped to 1.5 (in Union County the streams were unsurveyable due to high water). In 1992 the number increased to 3.7 redds per mile in the Grande Ronde River basin.

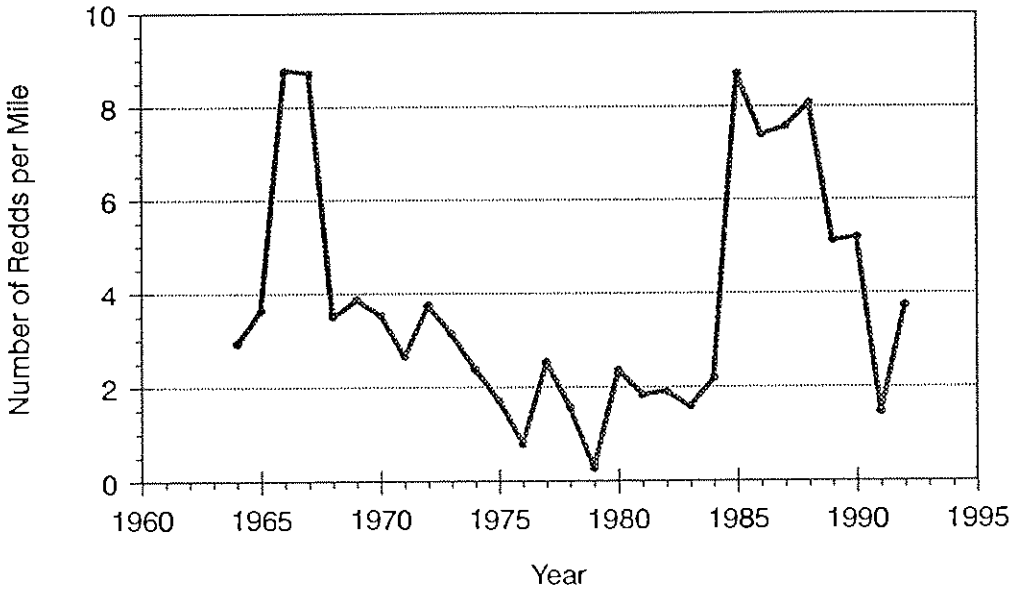

Figure 1. Grande Ronde River basin summer steelhead adult spawning ground survey counts from 1964 through 1991.

Populations historically and currently present:

Sensitive species: The United States Forest Service recognizes Grande Ronde River basin summer steelhead as a sensitive species.

ODFW provisional wild fish population list: Table 1.

Table 1. ODFW provisional wild fish population list for the Grande Ronde River basin.

River Area	Number of Distinct Populations
Lower Grande Ronde River (mouth to confluence of the Wallowa River)	one population
Joseph Creek	one population
Wenaha River	one population
Wallowa River	one population
Minam River	one population
Upper Grande Ronde River above mouth of the Wallowa River	one population

Life History and Population Characteristics

Wild Production: Steelhead habitat throughout the basin has been impacted by a variety of land-use activities, however some areas such as the Wenaha River drainage have remained relatively unaltered. Major problems in the basin limiting production are riparian habitat degradation, low flows, water temperatures, and lack of rearing habitat.

Outside the basin, a major factor limiting summer steelhead production is mortality during smolt outmigration through eight Columbia and Snake river dams and eight reservoirs . Other factors outside the basin include mainstem harvest of adults, adult migration delays resulting from elevated water temperatures in reservoirs, and unexplained losses of adults during upstream migrations based on dam counts. Dam mortality primarily occurs from: 1. Passage through unscreened dam turbines (Ice Harbor and The Dalles dams). An estimated 15 percent of smolts that pass through turbines are killed at each dam; 2. Handling during collection and transport by barge; and 3. Reservoir loss between dams due to migration delays and predation.

Currently a successful program of collecting smolts at Lower Granite, Little Goose, and McNary dams and transporting them downstream by barge or truck is under way. Although predation may be high due to the concentrated numbers at time of release, the transport program is improving smolt to adult survival.

Distribution: Summer steelhead spawn and rear throughout the basin (Figure 2). Principal spawning areas include the upper mainstem and tributaries of the Grande Ronde River, Joseph Creek, Wenaha River, Wallowa River, Minam River, Deer Creek, Bear Creek, and the Lostine River (Fulton 1970). In Washington's portion of the basin, spawning and

Figure 2. Grande Ronde River basin Summer Steelhead distribution map.

rearing occurs in Joseph, Buford, Rattlesnake, Cottonwood, Bear, Wenatchee, Crooked, and Butte creeks, and the North Fork Wenaha River (Kendra 1985).

Trends in Abundance: Redd counts conducted annually on the Grande Ronde River and tributaries since 1964 indicate that summer steelhead returns declined dramatically through the 1970s and early 1980s (Figure 1 and Appendix A Table 1), despite reductions and elimination of sport harvest. The decline has been related to mortality at Columbia and Snake river dams, habitat degradation, Columbia River harvest impacts, and ocean conditions. Within the basin, factors limiting summer steelhead production are riparian habitat degradation, lack of quality rearing habitat, siltation, low flows, elevated water temperatures and irrigation water withdrawals.

It is assumed that wild spawning escapement and production is currently near equilibrium; wild production is replacing itself at present levels of escapement, without hatchery supplementation. However, some of the recent increases in redd counts can be attributed to hatchery fish spawning in the wild, especially in Whiskey Creek, a tributary to the Wallowa River. The current Oregon escapement in the Grande Ronde River basin of wild summer steelhead is 9,774 adults. This estimate is based on the average number of redds per mile (4.75) from 1988 through 1992 (Appendix A Table 1), expanded by an estimated 1,240 miles of available spawning habitat, and multiplied by 1.67 fish per redd (Carmichael et al. 1987). Full seeding is estimated to be 16,566 wild fish. It is estimated that wild spawning escapement is currently between 50 and 75 percent of the escapement level needed to fully seed available rearing habitat. Calculations used in United States v Oregon (Carmichael et al. 1987) estimate the carrying capacity of currently available rearing habitat for wild summer steelhead is 322,888 smolts. This smolt production goal is not sufficient to maintain escapement levels needed to fully seed rearing habitat. The assumption that supplementation is needed to maintain high seeding levels is being evaluated.

Juvenile Life History: Limited data indicate that most summer steelhead rear for two years in the Grande Ronde River prior to migration to sea. Analysis of scales from 26 wild adult summer steelhead collected at Wallowa Hatchery during 1983-1984 showed all had smolted at age 2 (Carmichael, unpublished. data). Most smolt migration occurs from April through June (Smith 1975).

Trapping data suggest that the peak number of wild summer steelhead leaving the basin occurs in May (Mullarkey 1971; ODFW, unpublished. report; Smith 1975) . In Lookingglass Creek, the age of juvenile outmigrants ranged from age 0+ to age 3+, although most juveniles were age 1+ and age 2+ (Master File Table 1). There is a smaller pulse of fish in the fall, when juveniles are thought to migrate to lower stream reaches to avoid freezing conditions in upper tributaries. Upstream areas may be repopulated the following spring. These observations indicate that juveniles also may move upstream to find cool water sanctuaries during the summer.

Migration: Current Oregon escapement in the Grande Ronde River of wild summer steelhead is estimated at 9,774 adults. Adults spend one to three years in the ocean before returning to spawn, with most spending one year in the ocean. Returning Grande Ronde River adult summer steelhead pass Bonneville Dam during July and pass John Day Dam primarily during August through October. Like most populations in the Snake River basin, Grande Ronde River summer steelhead migrate through the lower Snake River during two periods; a

fall movement that peaks mid to late September, and a spring movement that peaks during March and April. Some adult summer steelhead enter the lower Grande Ronde River as early as July but most adults enter from September through March.

Age at Maturity: Wild fish are primarily four-year-old fish, spending two years in fresh water, one and a half years in the ocean, and another one half year migrating to the basin and holding there until spawning. Spawning occurs from March through mid-June. Peak spawning occurs from late April through May. Fry emerge from May through July.

Other Distinguishing Characteristics: Milner and Teal (1984) have found no significant genetic differences between summer steelhead sampled in Chesnimnus Creek in the Grande Ronde River system (Type A), Little Sheep Creek (Imnaha River, Type A), and Mission, Cottonwood, and Big Canyon creeks (Clearwater River, Type B).

Cluster analysis of Columbia River summer steelhead populations using biochemical, body shape, meristic, and life history characteristics has distinguished three subgroups of steelhead east of the Cascades. The subgroup that includes Grande Ronde River summer steelhead is comprised of wild populations from Columbia River tributaries between Fifteenmile Creek and the Entiat River, the Lower Snake River and the Salmon River. The second subgroup is mainly comprised of hatchery populations from tributaries of the Columbia and lower Snake river, including Wallowa Hatchery population. The third subgroup is made up of both wild and hatchery populations from the Clearwater and Salmon rivers in Idaho (Schreck et al. 1986).

Survival Rates: Two parameters determine wild production in the basin; 1. Egg-to-smolt survival rate and 2. Smolt-to-adult survival rate. Egg-to-smolt survival of wild populations is primarily determined by amount and quality of spawning and rearing habitat and seeding levels. Egg-to-smolt survival is assumed to be density dependent and thus decreases as escapement and seeding levels increase. Therefore, assuming no change in rearing habitat or out-of-basin factors, and a constant smolt-to-adult return rate, the level of escapement and production that maintains a replacement equilibrium is somewhat less than that required to fully seed available rearing habitat. Naturally produced populations can only be maintained at 100 percent juvenile seeding levels through increased survival rates resulting from changes in mainstem passage, harvest, or hatchery supplementation. In streams managed for wild populations, supplementation is not a management option. Smolt-to-adult return rate to the basin is determined by out-of-system factors and is primarily influenced by migration mortality at and between eight mainstem dams, ocean survival rate, and Columbia River harvest.

Hatchery production: The Grande Ronde River summer steelhead hatchery program is part of the LSRCP. The goal of the program is to compensate for losses of anadromous fish due to the construction of four dams on the lower Snake River. The LSRCP is mandated by federal legislation. Annual production and release of hatchery smolts under the program will continue under alternative two. The goals and objectives for implementing LSRCP in Oregon and Washington may be incorporated into the Grande Ronde River Basin Plan.

Under the LSRCP Irrigon Hatchery was constructed and Wallowa Hatchery was expanded for the Grande Ronde River summer steelhead program. In addition, an advanced

juvenile rearing and adult trapping facility (Big Canyon satellite facility) was constructed on Deer Creek, a Wallowa River tributary.

Adults are trapped and spawned at Wallowa Hatchery and eyed eggs are transferred to Irrigon Hatchery. Fish are reared at Irrigon Hatchery to the pre-smolt stage and then transported back to Wallowa Hatchery and the Big Canyon facility for a two-to-eight-week acclimation period prior to release. Some smolts are outplanted directly from Irrigon Hatchery to the Grande Ronde River system without acclimation. Additional Wallowa stock smolts are reared at Lyons Ferry Hatchery (Washington) for the Grande Ronde River.

Under the LSRCP, 662,500 smolts are planned for release annually in Spring Creek at Wallowa Hatchery, and 425,000 smolts for release at Big Canyon facility (this includes a direct stream release of 50,000 smolts) (Table 2). These releases are to provide fisheries benefits in the basin and were initially to provide hatchery supplementation. Additional smolt releases are made in the upper Grande Ronde River, the mainstem at Wildcat Creek, and Catherine Creek. Direct stream releases in the Wallowa River have been discontinued since 1990.

Table 2. Proposed release sites on the Grande Ronde River for summer steelhead (modified from Carmichael 1987a).

Release Site	Population	# to be Released	Type of Release
Oregon release			
Wallowa Hatchery	Wallowa	662,500	hatchery
Deer Creek	Wallowa	50,000	stream
Big Canyon Creek	Wallowa	375,000	advanced-rearing ponds
Grande Ronde R. at Wildcat Creek	Wallowa	50,000	stream
Catherine Creek	Wallowa	62,500	stream
Upper Grande Ronde R.	Wallowa	200,000	stream
Washington release			
Cottonwood Creek	Wallowa	250,000	conditioning ponds
Total		1,650,000	

The decision was made not to supplement the Minam and Wenaha rivers due to their pristine, wild and scenic, and wilderness characteristics during the planning phase of LSRCP. Joseph Creek has never been supplemented. Based on trend data and the physical distance from areas containing hatchery populations Joseph Creek is considered to be a relatively healthy population. Based on these factors we do not plan any hatchery supplementation in the above subbasins.

Source and Origin of Broodstock: Broodstock development for Wallowa Hatchery began with collection of summer steelhead at Ice Harbor Dam in 1976 and at Little Goose Dam in 1977 and 1978 (Master File Table 2) These fish were of mixed Snake River populations of unknown origin, from spring-run fish only. An attempt was made to collect small "A-run" steelhead, but some large "B-run" fish were also used. In 1979, Pahsimeroi Hatchery stock eggs were obtained from MacKay Hatchery in Idaho. Beginning in 1980, all broodstock has come from summer steelhead returning to Wallowa Hatchery.

Broodstock is selected from throughout the hatchery return and may include some naturally produced fish. Since 1987, managers have marked all Wallowa Hatchery steelhead, making the proportion of hatchery and wild broodstock identifiable.

Release Numbers and Location by Stream: Lower Snake River Compensation Plan objectives include restoration and maintenance of wild spawning populations, and reestablishing fisheries. Summer steelhead releases are aimed primarily at reestablishing fisheries. A total of 1.6 million smolts are currently released annually in the Grande Ronde River basin from Oregon and Washington. Under the LSRCP releases have occurred since 1970 in Washington (Master File Table 3), and since 1978 in Oregon (Master File Table 4).

Under the LSRCP, Oregon's mitigation goal for hatchery summer steelhead is 9,184 fish from the Grande Ronde River basin. To achieve smolt production goals, a return to the hatchery of 1,035 adults is needed. Calculations for estimating wild production and hatchery supplementation requirements are based on assumptions from *United States* v. *Oregon* 1986 (Appendix A Figure 1). These assumptions are based on production of 1.4 million smolts at five fish per pound (320,000 pounds) scheduled for the hatchery program in Oregon and 200,000 smolts scheduled for the hatchery program in Washington. These smolts are reared according to the following schedule.

A) 1,350,000 reared at Irrigon Hatchery, Oregon release
B) 50,000 reared at Lyons Ferry Hatchery, Oregon release
C) 200,000 reared at Lyons Ferry Hatchery, Washington release

The first releases of hatchery summer steelhead in the Grande Ronde River were made by the Washington Department of Wildlife. From 1970 to 1982, Skamania stock summer steelhead from Ringgold and Tucannon hatcheries (Washington) and Dworshak Hatchery (Idaho) were released near Cottonwood Creek. Since 1985, summer steelhead released at Cottonwood Creek have been Wallowa Hatchery stock reared at Lyons Ferry Hatchery.

Fecundity: Estimated fecundity for females returning to Wallowa Hatchery in 1979 through 1981 ranged from 3,282 eggs to 6,758 eggs per female (Howell et al. 1984). Average

fecundity for return years 1984 through 1987 was 4,997 eggs per female. The range was from 4,339 eggs to 5,673 eggs per female.

Sex Ratio: The sex ratio of 1976 through 1991 returns to Wallowa Hatchery is shown in Master File Table 2. The percentage of females ranged from 47.6 to 79.3 percent (mean 63.3 percent).

Survival Rates: An average egg-to-smolt survival of 57.5 percent was calculated based on average egg-to-fry and fry-to-smolt survival rates from 1985 through 1989 brood years (Carmichael et al. 1987).

Evaluation of smolt releases made by the ODFW show an average smolt-to-adult survival of 0.84 percent for the 1986 broodyear (Carmichael et. al 1991).

Size Structure: From 1985 through 1990 mean fork length of adult summer steelhead ranged from 467 to 838 mm for males and from 576 to 772 mm for females. Mean fork length ranges are shown in Master File Table 5.

Age at Return: Age composition for 1981 through 1990 Wallowa Hatchery summer steelhead returns is summarized in Master File Table 6. Return years 1981 through 1984 represent smolts released after two years of freshwater rearing. Starting in 1985, returns were from smolts reared in fresh water for one year. The percentage of fish returning after one year of ocean rearing was similar regardless of age at release; an average 55.4 percent for 1981 through 1984 returns, and 57.7 percent for 1985 through 1990 returns.

Migration: Returning summer steelhead enter Wallowa Hatchery between early March and mid-May. In 1990, 87.6 percent of the fish entered the hatchery between 19 March and 15 April (Master File Table 6). Returning summer steelhead enter Big Canyon facility between early April and late May. In 1990, 88.5 percent of the fish entered the facility between 02 April and 06 May (Master File Table 7 and 8), (Carmichael and Messmer 1985; Carmichael et al. 1986-90).

Angling and Harvest

The Grande Ronde River is within ceded lands of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and Nez Perce Tribe, and has long been important for tribal subsistence fishing. Both the CTUIR and Nez Perce Tribe have usual and accustomed fishing sites located throughout the basin, secured by treaties. Subsistence harvest has decreased in recent years due to depressed fish runs. Tribal subsistence summer steelhead harvest in Oregon since 1964 has been less than one percent of total in-basin harvest.

Summer steelhead sport fisheries in the basin traditionally occurred from August through December on the lower river, from State Highway 129 in Washington to Wildcat Creek (RM. 54) in Oregon. Fisheries also occur now during the spring on the upper Grande Ronde and Wallowa rivers. Historically the majority of the harvest occurred during the fall fishery in the lower Grande Ronde River. Angler effort and harvest in the spring has increased in the basin since 1986 when the fisheries reopened.

Sport harvest of summer steelhead in Oregon's portion of the Grande Ronde River is shown in figures three and four and Appendix A Table 2. Washington sport harvest is shown in figure five and Appendix A Table 3. (From 1963, all Oregon catch estimates from salmon-steelhead catch-card returns have been corrected for non-response bias using the method described in "An Evaluation of the Punch Card Method of Estimating Salmon-Steelhead Sport Catch" Ronald H. Hicks and Lyle D. Calvin, Oregon State University Agricultural Experimental Station, Technical Bulletin 81, November 1964). Special regulations closed the Grande Ronde River to steelhead angling in Oregon and Washington in the mid-1970s. In 1983, 15 miles of the mainstem from RM. 39 to RM. 54 (near Troy) were opened to a catch and release fishery. In 1986, 43 miles of the mainstem and 26 miles of the Wallowa River were opened to harvest of hatchery fish. Catherine Creek was included in 1991.

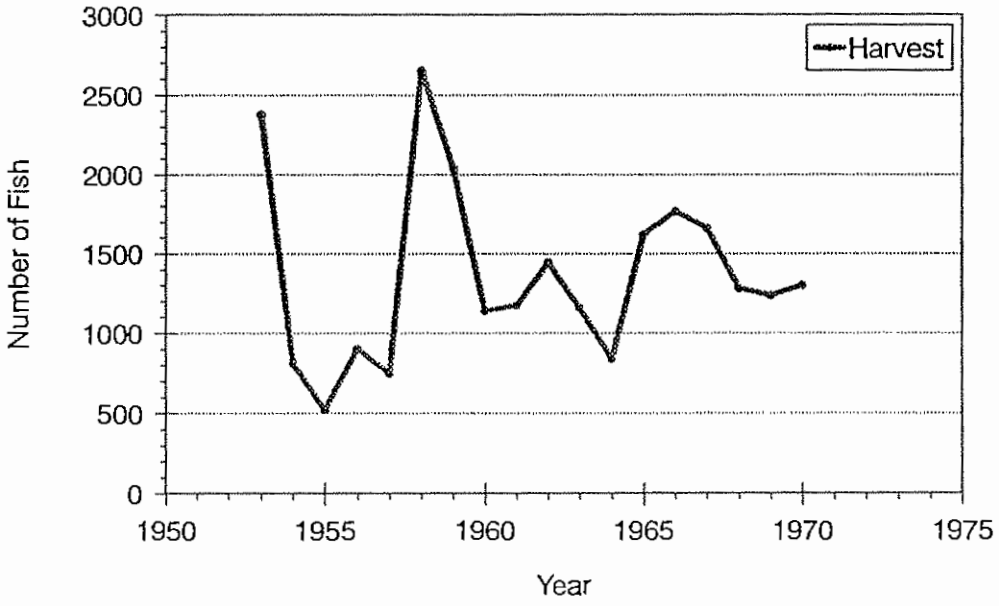

Figure 3. Estimated Oregon sport harvest of summer steelhead in the Grande Ronde River and major tributaries from 1953 through 1970(ODFW 1959-73).

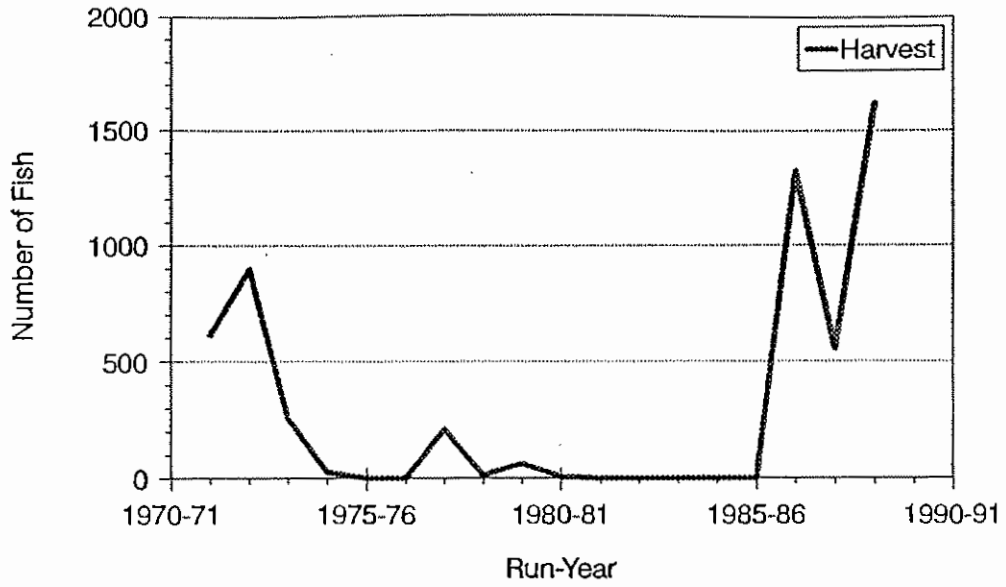

Figure 4. Estimated Oregon sport harvest of summer steelhead in the Grande Ronde River and major tributaries by run-year from 1971-72 through 1989-90 (ODFW 1959-73) The Grande Ronde River was closed to angling from 1974-82. A catch and releases fishery was allowed from 1983 through 1985 in the lower Grande Ronde River. The lower Grande Ronde and the Wallowa rivers were opened to harvest of marked hatchery fish on January 1, 1986.

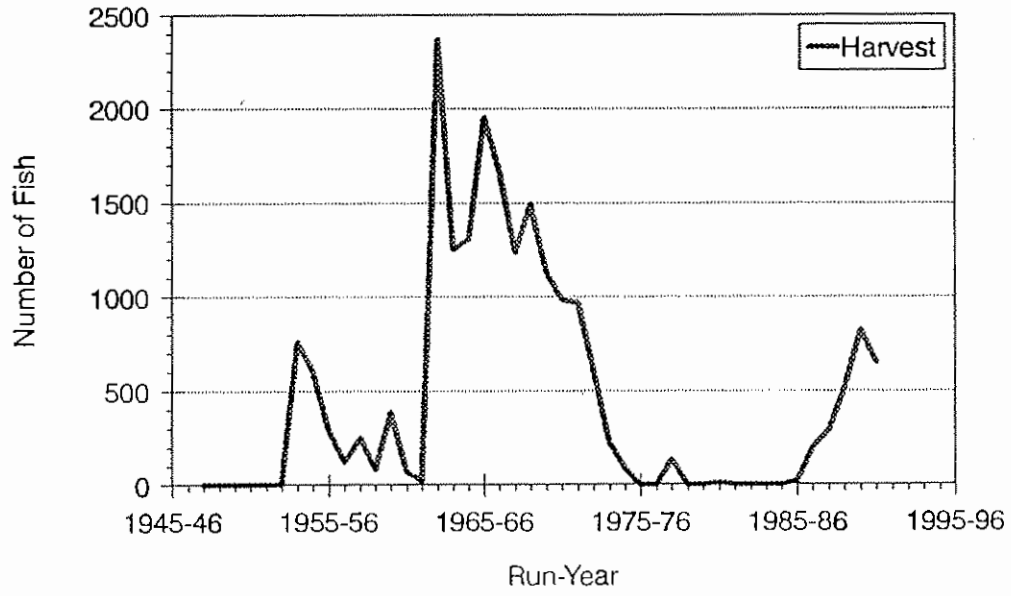

Figure 5. Estimated Washington sport harvest of summer steelhead in the Grande Ronde River, 1947-48 through 1991-92 (Washington Department of Wildlife, 1992 files). Catch is based on catch-card returns corrected for non-response bias. For run-years 1947-48 through 1960-61 data was only collected from December through April.

Columbia River catch data has shown that a significant portion of summer steelhead destined for Wallowa Hatchery are caught in the Zone Six treaty net fishery (Appendix A Table 4). During the 1984-85 and 1985-86 run years 45 percent of marked 1982 brood Wallowa Hatchery summer steelhead were caught in the Zone Six fishery (mostly in targeted sockeye salmon fisheries) and four percent were caught in the Columbia River sport fishery. These percentages are based on total catch and escapement recoveries of coded-wire tags, but do not include unaccounted strays or pre-spawning mortality losses. No data are available on exploitation of Grande Ronde River wild steelhead populations in the Columbia River, but it is probable that wild and hatchery fish are harvested at a similar rate.

The tribes, Oregon Department of Fish and Wildlife, and Washington Department of Wildlife (WDW) have agreed that future management of harvest levels within the Grande Ronde River basin should be based on run size each year through co-management strategies. Under the LSRCP Washington's mitigation goal for returns of summer steelhead back to the Grande Ronde River is 1,550 fish. Oregon's mitigation goal is 9,184 summer steelhead back to the Grande Ronde River, with total for Oregon and Washington equaling 10,734 fish. The WDW has requested that 70 percent of this number be available for sport and tribal harvest in Washington when full escapement is achieved. At lower escapement levels, Washington harvest will be based on co-management agreements.

Regulations: Only fin-clipped summer steelhead may be taken from the Grande Ronde River system, others must be released without removal from the water. For Catherine Creek barbless hooks are required 1 November through 15 April. For the Grande Ronde River up to Meadow Creek barbless hooks are required 1 September through 15 April. The Minam River up to Cougar Creek is closed to salmon and steelhead angling. For the Wallowa River from the mouth to the Lostine River barbless hooks are required 1 September through 15 April, The Wenaha River up to Crooked Creek is catch and release only with barbless hooks required 1 September through 15 April. The daily catch limit for summer steelhead is two fish per day, the weekly catch limit for summer steelhead six fish in seven consecutive days, and the annual catch limit for summer steelhead is 40.

Management Considerations

Status

Major Management Problems and Issues

1. Impacts of residualized hatchery smolts on resident and anadromous juvenile salmonids are not fully understood.

2. We have developed a successful summer steelhead program using Wallowa stock. Angler success and expectations are high. We need to proceed slowly with any modifications to the program, if necessary, to achieve compliance with the Wild Fish Management Policy without affecting the overall success of the program.

3. Out of basin constraints limit our ability to achieve wild escapement goals.

4. Supplementation is an untested theory and more information is needed.

5. More accurate methods of estimating pre-fishery escapement into the Grande Ronde River basin are necessary.

6. Identify life history and genetic information to better define summer steelhead populations in the basin.

7. There is an incomplete understanding of current habitat and carrying capacities of the Grande Ronde River basin.

8. Population boundaries are poorly understood and require further study to more accurately define them.

9. We must coordinate harvest regulations with Washington and Idaho.

Information Needs

1. More information is needed on specific life history characteristics for wild summer steelhead including age and timing of juvenile outmigration, survival rates of each life stage, sex ratio, age and timing of adult returns.

2. More information is needed on the method and ability to enumerate total escapement to the mouth of the Grande Ronde River utilizing Lower Granite Dam counts.

3. More information is needed on how to better determine effects of habitat restoration and improvement on egg to smolt survival rates.

4. More information is needed on the impacts of out-of-system management plans and harvest strategies.

5. More information is needed to attain the ability to define and manage populations adequately under WFMP guidelines.

5. More information is needed on result of smolt releases, including post-release juvenile survival, residualism, survival to adult, number of hatchery fish spawning in the wild, and the impact of supplementation on naturally produced resident and anadromous fish populations.

7. More information is needed to better determine whether recent summer steelhead run-timing changes are genetically or environmentally related.

8. Information is needed to devise methods to more accurately arrive at an escapement goal.

Management Alternatives

In this section we examine two management alternatives to achieve compliance with the Wild Fish Management Policy. Although historical programs with hatchery releases of nonendemic populations and the strategy of widespread distribution of hatchery fish in recent programs may not be in compliance with the present Wild Fish Management Policy, we present two alternatives that comply with the policy. All of the alternatives call for modifications to the present operating program and are based on six provisional populations in the Grande Ronde River basin. Alternative 1 calls for no hatchery programs and relies entirely on wild production and habitat protection and enhancement to meet fishery needs. Alternative 2 calls for the same extensive wild production and habitat protection and enhancement as Alternative 1 as well as a hatchery program conducted in such a way as to minimize the impact on wild populations and provide harvest benefits.

Management of wild and hatchery production in Oregon must follow guidelines of the Department's Wild Fish Management Policy. In the Grande Ronde River basin the Minam and Wenaha rivers and Joseph Creek will be managed as wild population streams with no releases of hatchery fish and no summer steelhead shall be removed for hatchery broodstock. Although hatchery strays have not been prevented from entering these streams the above three populations have not been directly supplemented.

In all of these programs we will investigate the need to develop individual hatchery populations consistent with provisional population designations listed in the Wild Fish Management Policy until we obtain better information for delineating populations. Monitoring would be conducted of the contributions of wild and hatchery fish to fisheries and the ratio of hatchery to wild fish on the natural spawning areas. Programs that approach the limits of the Wild Fish Management Policy would be modified or reduced proportionately to maintain compliance with policy.

Alternative 1

Policies

Policy 1. **No hatchery summer steelhead shall be released in the Oregon portion of the Grande Ronde River basin.**

Objectives

Objective 1. **Maintain the genetic diversity, adaptiveness, and abundance of wild summer steelhead in the Grande Ronde River basin.**

Assumptions and Rationale

1. The Grande Ronde River basin supports six populations of wild summer steelhead based on the WFMP provisional list .

2. The relationship of and interactions between the summer steelhead populations in the basin is unknown.

3. Escapement of wild summer steelhead is currently below the level needed to maximize wild production and provide fish for harvest.

4. Wild summer steelhead in the Grande Ronde River basin have been classified as a sensitive species by the USFS.

5. Monitoring the distribution and abundance of summer steelhead will provide an indication of population status and the effectiveness of management actions.

6. Washington Department of Wildlife administers a summer steelhead hatchery program on the lower Grande Ronde River which influences some of the remainder of the basin.

7. Interbreeding with stray hatchery populations may hold production of wild fish below their potential or alter their life history characteristics.

8. Escapement of wild fish will not greatly increase until changes in the Columbia Basin Fish Management Plan allows for a greater escapement of wild summer steelhead over Lower Granite Dam.

9. Columbia and Snake rivers fish passage and harvest situations will improve but will continue to limit spawning escapement.

10 Estimates of run size obtained from dam counts, mark ratios, and spawning counts are reasonably accurate.

11. ODFW will continue to work with Washington, Idaho, and Tribes to achieve mutual goals and objectives.

Actions

Action 1.1	Eliminate the existing summer steelhead hatchery program in the Grande Ronde River basin.
Action 1.2	Develop methodology to obtain more accurate spawning escapement estimates.
Action 1.3	Document distribution of summer steelhead in the Grande Ronde river basin.
Action 1.4	Determine trends of summer steelhead distribution and abundance in selected reaches of the Grande Ronde River basin.
Action 1.5	Increase accuracy of summer steelhead redd counts.
Action 1.6	Improve methodology for predicting run strength.
Action 1.7	Document genetic and phenotypic characteristics of summer steelhead using biochemical and meristic parameters.
Action 1.8	Monitor summer steelhead run status through time consistent with the Gene Conserveation Policy and the Wild Fish Management Policy.
Action 1.9	Monitor downstream passage activities.
Action 1.10	Minimize the impact of hatchery abd wild trout fisheries on wild summer steelhead juveniles.
Action 1.11	Monitor the status and effects of WDW's hatchery steelhead program within the lower Grande Ronde River.
Action 1.12	Determine specific life history characteristics of wild summer steelhead populations including age and timing of juvenile outmigration, survival rates of each life stage, sex ratio, and age and timing of adult returns.
Action 1.13	Utilize proposed weirs on the Minam and Wenaha rivers to better enumerate summer steelhead numbers and to prevent straying.

Objective 2. Provide diverse angling opportunities for wild summer steelhead in the Grande Ronde River basin.

Assumptions and Rationale

1. Management under this alternative seeks to provide diverse angling opportunities including non-consumptive as well as consumptive use of wild summer steelhead.
2. Special angling regulations may be necessary.

3. Current escapement of wild summer steelhead will not provide the level of angling opportunity and harvest currently provided with the LSRCP hatchery program.

Actions

Action 2.1 Develop databases to more accurately determine escapement needs for the basin.

Action 2.2 Monitor angling pressure, catch, and harvest of wild summer steelhead through creel surveys on key stream reaches.

Action 2.3 Modify angling regulations to protect populations of wild summer steelhead when run size is less than 12,425 (75% of full seeding) by monitoring the run size predictors, harvest, and catch rates.

Action 2.4 Maintain enforcement of angling regulations at a level that insures protection of wild populations and an equitable use of the resource.

ALTERNATIVE 2

Policies

Policy 1. **The Minam and Wenaha rivers, and Joseph Creek shall be managed for wild summer steelhead. Hatchery fish shall not be released within these areas and none of these populations shall be utilized or removed for hatchery broodstock.**

Objectives

Objective 1. **Maintain the genetic diversity, adaptiveness, and abundance of wild summer steelhead in the Grande Ronde River basin.**

Assumptions and Rationale

1. The Grande Ronde River basin supports six populations of wild summer steelhead based on the WFMP provisional list.

2. The relationship of and interactions between the summer steelhead populations in the basin is unknown.

3. Escapement of wild summer steelhead is currently below the level needed to maximize wild production and provide fish for harvest.

4. Wild summer steelhead in the Grande Ronde River basin have been classified as a sensitive species by the USFS.

5. Monitoring the distribution and abundance of summer steelhead will provide an indication of population status and the effectiveness of management actions.

6. Washington Department of Wildlife administers a summer steelhead hatchery program on the lower Grande Ronde River which influences some of the remainder of the basin.

7. Interbreeding with stray hatchery populations may hold production of wild fish below their potential or alter their life history characteristics.

8. Escapement of wild fish will not greatly increase until changes in the Columbia Basin Fish Management Plan allows for a greater escapement of wild summer steelhead over Lower Granite Dam.

9. Columbia and Snake rivers fish passage and harvest situations will improve but will continue to limit spawning escapement.

10. Estimates of run size obtained from dam counts, mark ratios, and spawning counts are reasonably accurate.

11. If constructed weirs on the Minam and Wenaha rivers could be utilized to enumerate summer steelhead numbers and to prevent straying.

12. ODFW will continue to work with Washington, Idaho, and Tribes to achieve mutual goals and objectives.

13. The current hatchery summer steelhead program for the Grande Ronde River system uses the Wallowa Hatchery population.

14. We can convert to an indigenous population of summer steelhead without impacting the wild populations.

15. Indigenous hatchery populations once developed may be utilized for supplementation of wild spawning summer steelhead.

16. Acclimation of smolts, particularly in offstream water sources where adults can be captured (Big Canyon), will increase the probability that these adults will return where they were released and be intercepted prior to spawning.

17. Changes in hatchery practices e.g. size at release and time at release, may result in improved returns and reduced wild/hatchery interaction.

Actions

Action 1.1	Develop methodology to obtain more accurate spawning escapement estimates.
Action 1.2	Document distribution of summer steelhead in the Grande Ronde River basin.
Action 1.3	Determine trends of summer steelhead distribution and abundance in selected reaches of the Grande Ronde River basin.
Action 1.4	Increase accuracy of summer steelhead redd counts.
Action 1.5	Improve methodology for predicting run strength.
Action 1.6	Document genetic and phenotypic characteristics of summer steelhead using biochemical and meristic parameters to delineate populations.
Action 1.7	Monitor summer steelhead status through time consistent with the Gene Conserveation Policy and the Wild Fish Management Policy.
Action 1.8	Monitor downstream passage activities.
Action 1.9	Minimize impact of trout fisheries on wild summer steelhead juveniles.
Action 1.10	Determine specific life history characteristics of wild and hatchery summer steelhead by population; including age and timing of juvenile

outmigration, survival rates of each life stage, sex ratio, and age and timing of adult returns.

Action 1.11 Modify hatchery production, and fishery management, within the scope of the LSRCP, in order to avoid large excesses in spawning escapement.

Action 1.12 Determine impacts of residualized hatchery summer steelhead on wild rainbow trout, summer steelhead, and chinook salmon populations and make changes if appropriate.

Action 1.13 Determine if the use of acclimation ponds contributes to higher numbers of residualized summer steelhead.

Action 1.14 Evaluate the effects of size at release and time of release on survival and residualism of summer steelhead.

Objective 2. Provide diverse angling opportunities for wild and hatchery summer steelhead in the Grande Ronde River basin.

Assumptions & Rationale

1. Management under this alternative seeks to provide diverse angling opportunities including non-consumptive and consumptive use of summer steelhead.

2. Special regulations may be necessary to protect population fitness, life history characteristics, and to maintain healthy wild summer steelhead populations.

3. Present catch rates for hatchery summer steelhead provide a quality fishery.

4. Harvest will be managed to provide escapement for wild production.

5. Annual variation of run strength precludes setting a fixed objective for fisheries and may require periodic adjustments to angling regulations.

Actions

Action 2.1 Develop databases to more accurately determine escapement needs for the basin.

Action 2.2 Monitor angling pressure, catch, and harvest of wild and hatchery summer steelhead through creel surveys on key stream reaches.

Action 2.3 Develop hatchery guidelines.

Action 2.4	Modify angling regulations to protect populations of wild summer steelhead when run size is less than 12,425 (75% of full seeding) by monitoring the run size predictors, harvest, and catch rates.
Action 2.5	Maintain production of hatchery summer steelhead to provide a sport fishery in the Grande Ronde River basin.
Action 2.6	Harvest strategies will be monitored and adjusted to maintain adequate numbers to meet egg take needs.
Action 2.7	Evaluate harvest of surplus hatchery summer steelhead to limit the possibility of hatchery/wild spawning interaction.
Action 2.8	If it appears as though broodstock numbers are below those needed to maintain the hatchery program then harvest will be curtailed.
Action 2.9	Maintain enforcement of angling regulations at a level that insures protection of wild populations and an equitable use of the resource.
Action 2.10	Evaluate the need for special summer steelhead angling closures to protect sensitive, threatened, and endangered species such as bull trout and chinook salmon.
Action 2.11	Monitor the status and effects of WDW's hatchery steelhead program within the lower Grande Ronde River.
Action 2.12	Monitor annual escapement levels from dam counts & mark recoveries and make in-seasons adjustments to regulations if necessary.
Action 2.13	Minimize wild summer steelhead smolt and pre-smolt harvest while allowing harvest of hatchery and wild trout.
Action 2.14	Develop regulations to encourage harvest of residual hatchery summer steelhead.
Action 2.15	Continue to mark all hatchery summer steelhead to facilitate harvest management and to evaluate straying rates.
Action 2.16	Develop and implement, if necessary, methods to maintain the hatchery program within the constraints of the Wild Fish Management Policy, i.e., reduced residualism rates, reduced straying rates, and increased harvest of hatchery summer steelhead.
Action 2.17	Evaluate whether later run timing is a result of genetic or environmental factors.
Action 2.17	Evaluate use of early (fall) summer steelhead returns as broodstock for a segment of hatchery production to increase harvest opportunities.

Action 2.16 Utilize Wallowa Hatchery, Big Canyon facility, and develop additional acclimation sites to provide target fisheries and to reduce straying of hatchery fish.

Objective 3. Determine if supplementation is an appropriate management strategy.

There is at the present time an ongoing study that includes but is not limited to the following actions. As results come in the actions may be modified. ODFW is in the process of completing the experimental design of the project. Two study streams in the Imnaha River basin and eight study streams from the Grande Ronde River basin were selected. Five treatment streams will be supplemented while five control streams will not be supplemented. The development of stream-specific broodstock for each of the streams being supplemented was proposed. This will shift the primary use of Wallowa population summer steelhead to augmenting harvest. Genetic information to be used as background information for this study was analyzed by the NMFS Genetics Monitoring Program. Additional summer steelhead juveniles were also provided to NMFS so that the genetic effects of supplementation could be monitored.

Assumptions & Rationale

1. The term supplementation is used in the context of supplementation of natural production with hatchery fish.

2. Modifications to the summer steelhead program may be required to accommodate the evaluation.

3. Indigenous broodstock may need to be developed to meet objectives of the study.

4. The decision on summer steelhead supplementation will depend on results of the study.

5. The Grande Ronde River basin supports six populations of wild summer steelhead based on the WFMP provisional list.

Actions

Action 1.1 Limit supplementation of wild populations to that number necessary for experimental studies until the impacts of such activity are better known.

Action 1.2 Collect genetic information to define populations of summer steelhead.

Action 1.3 Evaluate performance and biological characteristics of hatchery summer steelhead smolts compared to hatchery smolts.

Action 1.4 Compare characteristics of adult summer steelhead returning from hatchery releases to those of wild adult summer steelhead.

Action 1.5 Compare summer steelhead production in supplemented and non-supplemented streams in the basin.

Action 1.6 Evaluate the performance and biological characteristics of juvenile summer steelhead which are naturally produced after supplementation with wild summer steelhead.

Action 1.7 Evaluate the effects of residual hatchery summer steelhead smolts on naturally produced summer steelhead.

APPENDIX A

Figure 1. Calculations for estimating wild production and hatchery supplementation requirements based on assumptions from *United States* v. *Oregon* 1986, Carmichael 1989, unpublished. report.

Smolt production:

1.67 adults per redd = 5,000 eggs per redd.

Miles of spawning habitat:

Wild-population streams (Minam River, Wenaha River, and Joseph Creek) 35 miles.

Oregon natural-population streams - 889 miles.

Washington natural-population streams - 60 miles.

Average basinwide redd count to provide full seeding of rearing habitat: - 8.0 redds/mile.

Smolt-to-adult return rates (back to Grande Ronde River basin):

Naturally produced smolts - 1.50 percent. 5.6

Hatchery produced smolts - 0.75 percent.

Egg-to-smolt survival rate:

Wild smolts at 100 percent seeding level - 1.89 percent.

Wild smolts at 75 percent seeding level - 2.23 percent.

Smolts produced from hatchery fish spawning naturally at 100 percent seeding level - 1.50 percent.

Table 1. Total Grande Ronde River basin summer steelhead redd counts, 1964-92 (ODFW Files).

Year	Miles Surveyed	Redds	Redds/Mile
1964	113	331	2.9
1965	175	636	3.6
1966	247	2,168	8.8
1967	161	1,404	8.7
1968	155	543	3.5
1969	158	610	3.9
1970	151	533	3.5
1971	146	388	2.7
1972	131	490	3.7
1973	148	463	3.1
1974	112	265	2.4
1975	86	147	1.7
1976	84	66	0.8
1977	83	210	2.5
1978	110	173	1.6
1979	109	31	0.3
1980	117	275	2.4
1981	100	183	1.8
1982	89	169	1.9
1983	99	157	1.6
1984	63[a]	138	2.2
1985	91	792	8.7
1986	92	680	7.4
1987	88	666	7.6
1988	87	702	8.1
1989	84.5	417	5.1
1990	82.5	438	5.2
1991[b]	61	89	1.5
1992	80.5	300	3.7

[a] *Wallowa Fish District only.*

[b] *La Grande Fish District waters were not surveyable due to high water conditions.*

Table 2. Estimated Oregon sport harvest of summer steelhead in the Grande Ronde River and major tributaries during 1959-73 and 1986-90 (ODFW Files). The Grande Ronde River was closed to angling from 1974-82. A catch and release fishery was allowed from 1983 through 1985 in the lower Grande Ronde River. The lower Grande Ronde and Wallowa rivers were opened to harvest of marked hatchery fish on 01 January 1986.

Year	Grande Ronde River	Wenaha River	Wallowa River	Minam River	Catherine Creek	Total
1959-1973						
1959	1,590	72	260	30	90	2,204
1960	709	85	221	65	59	1,139
1961	838	104	122	90	21	1,175
1962	1,278	68	44	27	27	1,444
1963	1,049	81	200	42	3	1,375
1964	691	9	177	148	*a*	1,025
1965	1,574	35	201	81	*a*	1,891
1966	1,921	60	115	26	13	2,135
1967	1,319	90	453	100	*a*	2,028
1968	1,252	18	272	1,221	*a*	1,663
1969	1,319	75	61	38	*a*	1,493
1970	1,017	14	233	35	4	1,303
1971	630	99	664	87	4	884
1972	706	23	35	0	0	764
1973	268	4	107	16	8	403
1985-86 to 1989-90 Run Year						
1985-86[b]	--	--	2	--	--	2
1986-87[b]	45	--	641	--	--	686
1987-88[b]	31	--	517	--	--	548
1988-89[b]	421	--	294	--	--	715
1989-90[b]	766	--	840	--	--	1,606
1990-91[b,c]	18	--	151	--	--	169

[a] *Catherine Creek harvest not included in total.*

[b] *Corresponds to fall through spring run-year.*

[c] *Low run year, emergency fishery closure from 15 November through 15 April.*

Table 3. Estimated Washington sport harvest of summer steelhead in the Grande Ronde River, 1947-87 (Washington Department of Wildlife, 1992 files). Catch is based on catch-card returns corrected for non-response bias.

Run Year	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
1947-48	--	--	--	--	--	--	--	0	0	0	0	0
1948-49	--	--	--	--	--	--	--	0	0	0	0	0
1949-50	--	--	--	--	--	--	--	0	0	0	0	0
1950-51	--	--	--	--	--	--	--	0	0	0	0	0
1951-52	--	--	--	--	--	--	--	0	0	0	0	0
1952-53	--	--	--	--	--	--	--	0	0	0	0	0
1953-54	--	--	--	--	--	--	--	46	82	136	494	0
1954-55	--	--	--	--	--	--	--	64	106	194	243	0
1955-56	--	--	--	--	--	--	--	34	72	156	26	0
1956-57	--	--	--	--	--	--	--	38	35	38	11	0
1957-58	--	--	--	--	--	--	--	68	74	25	82	0
1958-59	--	--	--	--	--	--	--	13	13	11	48	0
1959-60	--	--	--	--	--	--	--	292	34	51	7	0
1960-61	--	--	--	--	--	--	--	70	0	0	0	0
1961-62	0	0	0	0	0	0	0	0	24	0	2	0
1962-63	0	0	2	93	463	877	608	323	2	2	0	0
1963-64	0	0	0	37	173	716	286	55	0	0	2	2
1964-65	0	0	4	83	427	589	192	15	0	0	0	0
1965-66	6	4	2	15	415	899	367	133	71	172	63	8
1966-67	5	2	0	11	82	904	386	140	61	39	25	17
1967-68	2	0	2	8	77	764	291	50	52	19	19	4
1968-69	4	2	4	37	298	693	250	48	17	75	62	2
1969-70	0	0	8	38	184	512	263	64	11	34	11	2
1970-71	0	4	5	49	306	480	40	19	37	20	15	7
1971-72	2	5	5	5	231	469	112	68	32	16	16	4
1972-73	2	0	8	18	191	290	93	4	0	0	0	0
1973-74	0	2	0	4	44	166	4	4	0	0	0	0
1973-75	0	0	0	4	38	47	0	0	0	0	0	0
1975-76	0	0	0	0	0	0	0	0	0	0	0	0
1976-77	0	0	0	0	0	0	0	0	0	0	0	0
1977-78	0	0	0	0	3	100	18	3	3	9	0	0
1978-79	0	0	0	0	0	0	0	0	0	0	0	0
1979-80	0	0	0	0	0	0	0	0	0	0	0	0
1980-81	0	0	0	0	0	13	0	0	0	0	0	0
1981-82	0	0	0	0	0	0	0	0	0	0	0	0

Table 3. (Continued)

Run Year	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
1982-83	0	0	0	0	0	0	0	0	0	0	0	0
1983-84	0	0	0	0	0	0	0	0	0	0	0	0
1984-85	--	--	--	--	--	--	--	--	--	--	--	--
1985-86	0	0	0	0	4	18	0	0	0	0	2	0
1986-87	0	0	0	10	3	77	39	71	0	0	0	0

1986-87	Totals	400
1987-88	Totals	293
1988-89	Totals	515
1998-90	Totals	823
1990-91	Totals	653

Table 4. Catch and escapement distribution of Wallowa Hatchery stock summer steelhead based on recoveries of marked fish. Values are not adjusted for adult inter-dam losses (which include harvest).

Area	1987-88 Run Year (%)	1988-89 Run Year (%)	1989-90 Run Year (%)	1990-91 Run Year (%)	1991-92 Run Year (%)
Columbia River Sport Fishery	5.8	10.6	--		
Columbia River Treaty Net Fishery	34.5	49.5	34.1		
Deschutes River Sport Fishery and Trap	9.6	0.8	0.8		
Snake River Sport Fishery	11.5	6.4	26.1		
Grande Ronde River Sport Fishery	0.0	5.4	8.2		
Wallowa River Sport Fishery	14.5	2.0	4.9		
Wallowa Hatchery Escapement	24.1	25.3	25.9		

Table 1. Age composition of juvenile summer steelhead migrants trapped in Lookingglass Creek, 1969 (Mullarkey 1971, ODFW unpublished. manuscript). Age is expressed in years of freshwater rearing.

	MONTH (%)			
Age	April %	May %	June %	October %
0+	7.6	0.7	8.0	12.8
1+	31.6	48.2	65.2	37.2
2+	46.9	45.0	26.0	50.1
3+	13.9	6.0	0.8	0.0

Table 2. Summer steelhead trapped for Wallowa Hatchery program (Carmichael and Messmer 1985; Carmichael et al. 1986 to 1991). Hatchery population was developed from fish trapped in 1976-78 at Ice Harbor and Little Goose dams.

Return Year	Trapping Location	Total Adults	Females (Percent)	Males (Percent)	Females Spawned
1976	Ice Harbor Dam	85	(a)	(a)	35
1977	Little Goose Dam	83	55	28	48
1978	Little Goose Dam	86	57	29	43
1980	Spring Creek/ Wallowa Hatchery	142	85(59.9)	57(40.1)	85
1981	Spring Creek/ Wallowa Hatchery	205	153(74.6)	52(25.4)	142
1982	Spring Creek/ Wallowa Hatchery	140	111(79.3)	29(20.7)	111
1983	Spring Creek/ Wallowa Hatchery	308	225(73.0)	83(27.0)	216
1984	Spring Creek/ Wallowa Hatchery	906	431(47.6)	475(52.4)	384
1985	Spring Creek/ Wallowa Hatchery	506	325(64.2)	181(37.08)	318
1986	Spring Creek/ Wallowa Hatchery	1,919	966(50.3)	953(49.7)	812
1987	Spring Creek/ Wallowa Hatchery	3,855	2,092(54.3)	1,763(45.7)	590
1988	Spring Creek/ Wallowa Hatchery	2,073	1,376(66.4)	697(33.6)	551
1989	Spring Creek/ Wallowa Hatchery	1,220	605(49.6)	615(50.4)	400
1990	Spring Creek/ Wallowa Hatchery	953	486(51.0)	467(49.0)	462

a *Not determined.*

Table 3. Summary of Washington Department of Wildlife steelhead smolt releases in the Grande Ronde River system. Releases From 1970 to 1982 were Skamania River stock. Releases since 1985 were Wallowa Hatchery stock.

Year	Hatchery	# Released	Fish/pound	Remarks
1970	Ringgold	75,010	7.0	30,075 Ad - clip 30,115 branded
1973	Ringgold	57,235	5.1	
1974	Ringgold Tucannon	50,046 88,064	6.0 6.0	
1975	Ringgold Tucannon	30,000 88,064	6.5 6.5	74,522 Ad - clip
1976	Tucannon	79,721	7.8	
1978	Tucannon Dworshak	59,682 207,630	7.4	55,557 Ad - clip 918.0 fry
1981	Tucannon	113,700	6.5	106,800 Ad - clip and branded
1982	Tucannon	35,239	8.0	Ad - clip & branded
1985	Lyons Ferry	149,408	5.5-10.1	Ad - clip
1986	Lyons Ferry	124,200	4.6	Ad - clip/60,477 LV clip and branded

Table 4. Oregon summer steelhead smolt releases in the Grande Ronde River basin (Carmichael and Messmer 1985; Carmichael et al. 1986 to 1991).

Stock Brood Year	Hatchery of Rearing	Number Released	Size (fish/lb.)	Date of Release	Location of Release
Snake River					
1976	Wallowa	79,608	6.2	05/08/78	Spring Creek
1977	Wallowa	20,020	13.0	05/12/78	Spring Creek
1977	Wallowa	75,259	6.8-8.9	04/30/79	Spring Creek
1977	Wallowa	21,095	14.7	05/16/79	Spring Creek
1978	Wallowa	34,900	5.0	04/05/80	Spring Creek
Pahsimeroi					
1979	Wallowa	28,308	10.6	04/21/80	Spring Creek
1979	Wallowa	62,000	5.1-5.3	04/03/81	Spring Creek
Wallowa					
1980	Irrigon	34,418	5.0-6.0	04/03/81	Spring Creek
1980	Wallowa	43,763	5.0-8.0	04/09/82	Spring Creek
1981	Irrigon	76,896	5.0-7.6	04/09/82	Spring Creek
1981	Wallowa	64,950	10.0-10.10	5/10/82	Spring Creek
1981	Cascade	57,250	6.6-6.9	04/25/83	Big Canyon Creek
1982	Lyons Ferry	75,878	4.7-7.4	05/02/83	Spring Creek
1982	Lyons Ferry	18,600	15.5	05/05/83	Spring Creek
1982	Lyons Ferry	64,591	8.3-10.4	05/04/83	Spring Creek
1982	Wallowa	41,600	8.4	05/06/83	Spring Creek
1983	Wallowa	46,818	7.1-9.0	04/24/84	Spring Creek
1983	Lyons Ferry	443,175	5.0-9.3	04/23/84	Spring Creek
1983	Lyons Ferry	57,100	6.8-9.3	04/27/84	Big Canyon Creek
1984	Irrigon	15,690	6.0	03/01/85	Wallowa Hatchery
1984	Irrigon	346,334	5.9	04/29/85	Wallowa Hatchery
1984	Lyons Ferry	284,021	7.5	04/29/85	Wallowa Hatchery
1984	Lyons Ferry	49,600	7.8-8.8	04/25/85	Big Canyon Creek
1984	Lyons Ferry	46,440	7.8-8.8	04/25/85	Catherine Creek
1985	Irrigon	194,553	4.2	05/05/86	Wallowa Hatchery
1986	Irrigon	535,328	3.6-5.3	04/24/87	Wallowa Hatchery
1986	Irrigon	52,078	4.4	04/22/87	Spring Creek

Table 4. (Continued)

Brood Year	Hatchery of Rearing	Number Released	Size (fish/lb.)	Date of Release	Location of Release
Stock					
Wallowa					
1986	Irrigon	151,053	4.4-5.0	04/15/87	Grande Ronde River
1986	Irrigon	291,332	4.4-4.9	04/08/87	Upper Grande Ronde
1986	Irrigon	72,438	4.4-5.0	04/13/87	Catherine Creek
1986	Irrigon	160,032	4.5-7.0	04/20/87	Wallowa River
1986	Irrigon	12,000	5.0	04/29/87	Hurricane Creek
1986	Irrigon	24,257	4.5-5.0	04/29/87	Prairie Creek
1986	Irrigon	222,526	4.4	04/29/87	Big Canyon Cr.
1986	Lyons Ferry	53,335	5.4-5.9	04/28/87	Wildcat Creek
1987	Irrigon	372,741	5.0	04/16/88	Wallowa Hatchery
1987	Irrigon	88,821	4.3	04/16/88	Wallowa Hatchery
1987	Irrigon	29,424[a]	5.0.	04/16/88	Wallowa Hatchery
1987	Irrigon	60,863	4.8	04/18/88	Spring Creek
1987	Irrigon	113,403	5.6	04/13/88	Upper Wallowa River
1987	Irrigon	236,825	5.0	04/05/88	Upper Grande Ronde
1987	Irrigon	62,520	4.9	04/04/88	Catherine Creek
1987	Irrigon	223,196	5.1	04/13/88	Big Canyon Cr.
1987	Irrigon	149,985	5.1	04/16/88	Lower Grande Ronde
1987	Lyons Ferry	50,640	6.0	04/28/88	Lower Grande Ronde
1988	Irrigon	408,942	4.9	04/20/89	Wallowa Hatchery
1988	Irrigon	87,969	3.8	04/20/89	Wallowa Hatchery
1988	Irrigon	53,965	5.2	04/24/89	Spring Creek
1988	Irrigon	111,052	5.2	04/20/89	Upper Wallowa River
1988	Irrigon	234,516	5.4	04/10/89	Upper Grande Ronde
1988	Irrigon	62,601	5.5	04/10/89	Catherine Creek
1988	Irrigon	273,496	5.0	04/27/89	Big Canyon facility
1988	Irrigon	109,603	5.2	04/25/89	Lower Grande Ronde
1987	Lyons Ferry	50,410	5.2	04/25/88	Lower Grande Ronde
1989	Irrigon	90,136	4.2	04/15/90	Wallowa Hatchery

[a] *Progeny from wild Lookingglass population and Big Canyon population . Smolts were 100% right ventral fin-marked.*

Table 4. (Continued)

Stock

Brood Year	Hatchery of Rearing	Number Released	Size (fish/lb.)	Date of Release	Location of Release
1989	Irrigon	405,769	4.9	04/15/90	Wallowa Hatchery
1989	Irrigon	53,747	5.1	04/19/90	Spring Creek
1989	Irrigon	61,377	5.4	04/18/90	Upper Wallowa River
1989	Irrigon	199,013	4.9	04/12/90	Upper Grande Ronde
1989	Irrigon	85,212	5.3	04/18/90	Catherine Creek
1989	Irrigon	223,379	4.8	04/19/90	Big Canyon facility
1989	Irrigon	50,036	5.4	04/30/90	Big Canyon facility
1989	Irrigon	94,393	5.4	04/24/90	Lower Grande Ronde

Table 5. Range (in mean fork length) for age-specific groups of adult summer steelhead at Wallowa Hatchery, 1985 through 1990 (Carmichael and Messmer 1985; Carmichael et al. 1986 to 1991).

Age Group[a]	Length Range Males (mm)	Length Range Females (mm)
1:1	589-624	577-603
1:2	688-743	689-715
1:3	733-758	749-768
2:1	591-649	577-656
2:2	690-836	690-726
2:3	--	772[b]
3:1	467[b]	576[b]
3:2	--	666[b]

[a] *Eight life history patterns were identified from scale analysis of adult summer steelhead that returned to Wallowa Hatchery and to Little Sheep Creek weir in 1985. These are designated with the American method as follows:*

1:1. Three-year-old fish; one year in freshwater before seaward migration and one year in the ocean.

1:2. Four-year-old fish; one year in freshwater before seaward migration and two years in the ocean.

1:3. Five-year-old fish; one year in freshwater before seaward migration and three years in the ocean.

2:1. Four-year-old fish; two years in freshwater before seaward migration and one year in the ocean.

1:2. Five-year-old fish; two years in freshwater before seaward migration and two years in the ocean.

2:3. Six-year-old fish; two year in freshwater before seaward migration and three years in the ocean.

Table 5. Continued.

3:1. Five-year-old fish; three years in freshwater before seaward migration and one year in the ocean.

3:2. Six-year-old fish; three years in freshwater before seaward migration and two years in the ocean.

[b] *One fish in this age group.*

Table 6. Percent age composition of adult summer steelhead that returned to Wallowa Hatchery 1981-90 (Carmichael and Messmer 1985; Carmichael et al. 1986-91).

Return Year	Sample Size	Age Group							
		1:1	1:2	1:3	2:1	2:2	2:3	3:1	3:2
1981	70	--	4.8	--	81.5	11.0	--	2.7	--
1982	92	4.1	2.0	3.0	34.3	56.6	--	--	--
1983	192	2.1	8.9	2.1	43.5	43.4	--	--	--
1984	577	30.0	0.1	--	62.4	6.9	--	0.4	--
1985	496	42.1	44.4	1.6	4.4	6.7	0.2	0.4	0.2
1986	1535	94.1	4.2	--	1.6	0.1	--	--	--
1987	3855	60.4	38.6	--	0.5	0.5	--	--	--
1988	2073	36.2	62.3	0.1	1.0	0.4	--	--	--
1989	1217	59.8	39.1	--	0.9	0.2	--	--	--
1990	954	53.4	41.4	0.1	4.5	0.5--	0.1	--	

[a] *Eight life history patterns were identified from scale analysis of adult summer steelhead that returned to Wallowa Hatchery and to Little Sheep Creek weir in 1985. These are designated with the American method as follows:*

1:1. Three-year-old fish; one year in freshwater before seaward migration and one year in the ocean.

1:2. Four-year-old fish; one year in freshwater before seaward migration and two years in the ocean.

1:3. Five-year-old fish; one year in freshwater before seaward migration and three years in the ocean.

2:1. Four-year-old fish; two years in freshwater before seaward migration and one year in the ocean.

Table 6. Continued

2:2. Five-year-old fish; two years in freshwater before seaward migration and two years in the ocean.

2:3. Six-year-old fish; two year in freshwater before seaward migration and three years in the ocean.

3:1. Five-year-old fish; three years in freshwater before seaward migration and one year in the ocean.

3:2. Six-year-old fish; three years in freshwater before seaward migration and two years in the ocean.

Table 7. Run timing of adult summer steelhead that returned to Wallowa Hatchery in 1989 and 1990 (Carmichael and Messmer 1985; Carmichael et al. 1986 to 1991). Trap was operated from March 1 to May 17 in 1989, and from March 2 to May 08 in 1990.

Year	Time Interval	Number	Percentage of Total
1989			
	12-18 March	--	--
	19-25 March	35	2.9
	26 March-01 April	386	31.6
	02-08 April	476	39.0
	09-15 April	179	14.7
	16-22 April	92	7.5
	23-29 April	27	2.2
	30 April-06 May	18	1.5
	07-13 May	7	.06
	14-20 May	0	0
1990			
	05-11 March	21	2.2
	12-18 March	36	3.8
	19-25 March	187	19.6
	26 March-01 April	360	37.8
	02-08 April	133	13.9
	09-15 April	155	16.3
	16-22 April	35	3.7
	23-29 April	26	2.7
	30 April-06 May	0	0
	07-13 May	0	0

Table 8. Run timing of adult summer steelhead that returned to Big Canyon facility in 1989 (Carmichael and Messmer 1991; Carmichael et al. 1986 to 1991). Trap was operated from 15 April to 30 May.

Year	Time Interval	Number	Percentage of Total
1989			
	09-15 April	151	43.5
	16-22 April	123	35.5
	23-29 April	19	5.5
	30 April-06 May	27	7.8
	07-13 May	14	4.0
	14-20 May	6	1.7
	21-27 May	5	1-4
	28 May 03 June	2	0.6

Table 9. Run timing of adult summer steelhead that returned to Big Canyon facility in 1990 (Carmichael and Messmer 1991; Carmichael et al. 1986 to 1991). Trap was operated from 01-04 April and 17 April to 22 May in 1990.

		Wild Fish		Hatchery Fish	
Year	Time Interval	Number	Percentage of Total	Number	Percentage of Total
1990					
	26 March-01 April	--	--	--	--
	02-08 April	4	15.4	125	40.3
	09-15 April	--	--	--	--
	16-22 April	6	23.1	91	29.5
	23-29 April	1	3.8	23	7.5
	30 April-06 May	12	46.2	59	19.2
	07-13 May	2	7.7	4	1.3
	14-20 May	1	3.8	5	1.6
	21-27 May	0	--	2	0.6

RESIDENT TROUT

Background and Status

Resident trout species are widely distributed throughout the Grande Ronde River basin and utilize many types of habitat. They are found in both large rivers and small streams as well as high elevation mountain lakes. All lakes higher than 6,000 feet in elevation were barren until stocking began in 1914 (Rayner 1946). Additional information is needed on specific life histories, limiting factors, and interactions with other fishes for trout populations in the Grande Ronde River basin. Classification of rainbow trout in the Columbia River basin is unresolved and throughout this Plan will be referred to as redband trout.

Habitat degradation is the major factor limiting production of trout species in the Grande Ronde River basin. Activities such as channel alterations, grazing, mining, agricultural practices, and timber harvest all affect trout populations. Irrigation withdrawals utilizing both seasonal and permanent structures can prevent free movement of fish, increase temperatures, and de-water habitat. Irrigation withdrawals in conjunction with water quality problems (temperature, sediment, and organic pollution) have affected trout populations. In some cases these impacts have been reduced compared to historic levels, in others the impacts are continuing. Water temperature levels which provide for optimal trout production must be maintained.

Origin

Populations historically and currently present:

Indigenous Species: Indigenous trout species currently present in the Grande Ronde River basin include; rainbow trout (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), kokanee (*Oncorhynchus nerka),* and mountain whitefish (*Prosopium williamsoni*).

Introduced Species: Introduced trout species currently present in the Grande Ronde River basin include; lake trout (*Salvelinus namaycush*), brook trout (*Salvelinus fontinalalis*), and cutthroat trout (*Oncorhynchus clarki*). Golden trout (*Oncorhynchus aguabonita*) are still suspected to be present from past stockings. In 1928 Arctic grayling (*Thymallus arcticus*) were stocked in Catherine Creek (10,000) and Meadow Brook Creek (35,000). It is doubtful that this species exists in the Grande Ronde River basin today.

Federal Threatened and Endangered Species: Bull trout are not currently listed but a petition to list has been submitted.

Sensitive species: The ODFW, USFS (Regions one, four, and six) and BLM all list the native redband and bull trout as sensitive/critical species. The USFWS lists the bull trout as a Category Two species (threatened or endangered listing may be warranted but sufficient accurate information is lacking), WDW lists the bull trout as a sensitive species, and the American Fisheries Society lists the bull trout as a species of concern. The USFWS was petitioned to list bull trout as endangered under the federal Threatened and Endangered Species Act by three Montana environmental organizations on 28 October 1992.

Distribution

The distribution of spawning populations of native trout species within the Grande Ronde River basin as recognized by the Department's provisional list of wild fish populations is summarized in Table 1. The general distribution of native and introduced trout in the Grande Ronde River basin is listed in Table 2.

Seasonal distribution data on all trout species is needed to achieve a better understanding of the habitat use pattern of trout. The majority of the data currently being used were collected during the summer months, which is not likely giving a complete distribution pattern during non-summer periods. Trout likely utilize a much larger area during other times of the year, when water temperatures are not limiting.

Individual genetically distinct native populations are thought to be widely distributed throughout the Grande Ronde River basin. Some are isolated by physical barriers while others are only spatially isolated from other populations.

Interspecific relationships

Competition from other fish species may limit trout production. Competition may be for food, living space, or they may prey directly on the trout. Current and past outplanting of hatchery trout may have affected native trout populations through interbreeding, competition, and resultant fisheries. The impacts of the steelhead program under the LSRCP on resident trout have been identified as a concern, but to date no evaluation studies have been undertaken. The number of residual summer steelhead will be a factor to be considered when determining trout stocking densities. Brook trout are known to hybridize with bull trout (Ratcliff and Howell 1992 and Leary et al 1991). When that happens the hybrids that result are usually sterile and the bull trout population may disappear.

More information is needed on genetic, geographical, and competitive relationships between hatchery trout, resident trout, hatchery summer steelhead, wild summer steelhead, hatchery spring chinook salmon, and wild spring chinook salmon.

RAINBOW TROUT (resident form)

Systematics

Many of the isolated rainbow trout populations in the Snake River basin (which includes the Grande Ronde River subbasin) have been identified as inland "redband" type trout. Some taxonomists suggest that the resident form of *O. mykiss* in most of the Grande Ronde River subbasin is part of the inland Columbia basin redband trout group. Genetic and meristic identification suggests that for many of the Grande Ronde River basin's isolated rainbow trout populations the above is valid, as described by Behnke 1979. Populations do not have to be physically isolated (by a barrier) in order to be a genetically unique breeding unit. Unique populations have been found that are only 20 miles apart, and not physically isolated. Further work is required in order to determine current status and distribution of inland Columbia basin redband trout in the Grande Ronde River basin.

Table 1. Distribution of native trout in the Grande Ronde River basin.

Location	Trout Populations			
	Rainbow	Bull	Kokanee	Whitefish
Grande Ronde River and tributaries				X
Lower Grande Ronde river (RM 39 stateline to RM 82)	X			
Upper Grande Ronde river[a] (RM 82 to RM 209)	X	X		
Joseph Creek	X			
Wenaha River	X	X		
Lookingglass Creek	X	X		
Jarbeau Creek	X	?		
Clarks Creek	X			
M. F. Clarks Creek	X			
Catherine Creek	X	X		
Little Creek	X			
Beaver Creek[a]	X	?		
Dry Beaver Creek	X			
Upper Beaver Creek	X			
Limberjim Creek	X	X		
E. F. Grande Ronde River	X			
Wallowa River (below and including Wallowa Lake)				X
Minam River	X	X		
Little Minam River	X	X		
Lostine River[a]	X	X		
Upper Hurricane Creek[a]	X	X		
Wallowa Lake	X	[c]	X	X
Wallowa River (above Wallowa Lake)[b]				X
E. F. Wallowa River[a]	X	X	X	
W. F. Wallowa River[a]	X	X	X	

a. *Kokanee limited to spawning and early rearing in reaches of the river above Wallowa Lake.*

b. *Brook trout are present in these areas; the status of bull trout originally native to these areas is unknown.*

c. *Historically present but are now extinct.*

Table 2. General distribution of resident trout species in the Grande Ronde River basin.

Species	Distribution in the Grande Ronde River Basin
Rainbow trout	Wide-spread in suitable habitat
Bull trout	Generally found in pristine watershed, higher elevation areas of the Grande Ronde, Minam, and Wenaha rivers, Wallowa River tributaries, Lookingglass and Catherine creeks.
Kokanee	Wallowa Lake and River above the lake
Brook trout[a]	Upper Grande Ronde and Wallowa river drainages and Wallowa Mountain high lakes
Lake trout[a]	Wallowa Lake
Golden trout[a]	Hobo, Razz, Prospect, and Swamp lakes
Cutthroat trout[a]	Frances Lake
Mountain whitefish	Wide spread in suitable habitat in the Grande Ronde River basin

[a] *introduced species*

The systematics of the species *O. mykiss* are complex. Similar phenotypic characteristics are also present in the Grande Ronde River anadromous form, inland steelhead. Inland Columbia River basin resident rainbow and inland steelhead are sympatric throughout those areas of the Grande Ronde River basin that allows access to anadromous fish and the two forms are probably not reproductively isolated from each other. Classification of rainbow trout in the Columbia River basin is unresolved.

There are six known populations of resident redband trout that are isolated by major geological barriers in the Grande Ronde river basin. These are located; 1. and 2. In the upper East and West Forks of the Wallowa River (two miles above Wallowa Lake), 3. Hurricane Creek (tributary to the Wallowa River), 4. Little Creek (tributary of Catherine Creek), 5. Jarbo Creek (tributary of Lookingglass Creek), and 6. Limberjim (tributary of the upper Grande Ronde River). Physical isolation over geological time leads to genetic differentiation by the isolated groups. Systematics studies of these groups are required. It is possible that any one of these isolated groups may be a remnant of an older fauna, or may have otherwise differentiated enough to compose its own subspecies. Samples of non-isolated populations have been collected for electrophoretic analysis from two streams in the Grande Ronde River basin to date (Horse and Broady creeks).

Life History and Population Characteristics

Natural Production: Resident redband trout tolerate water temperatures from 56° F. to 70° F. (Smith 1991). Redband trout mature between one and five years of age with most maturing at age three. They spawn mainly in the spring although studies of other inland populations as well as field investigations indicate that redband trout spawn throughout the year where water conditions allow. Fecundity for rainbow trout ranges from 200 to 9,000 eggs per female (Wydoski and Whitney 1979).

Distribution: Distribution of redband trout is wide-spread throughout the Grande Ronde River basin.

Hatchery production: Hatchery rainbow trout have been used to enhance fishery opportunities and harvest in the Grande Ronde River basin since 1925. Historically, releases have consisted of fry, fingerling, and legal-size (six to ten inch) fish. Some streams were stocked only once and many others were stocked annually until the mid-1950's. Wallowa Hatchery, located in Enterprise, is the primary rearing facility for Grande Ronde River basin rainbow trout programs. In the past there were occasional releases of fish from Oak Springs and Wizard Falls hatcheries. Releases were also made from fish reared at Hagerman National Fish Hatchery located in southern Idaho.

Release Numbers and Location By Stream: Rainbow trout allocation numbers for 1993 are presented in table three. Release records for other years are available at the Northeast Region ODFW office in La Grande.

The ODFW currently relies on releases of legal-size (six to ten inch) hatchery rainbow trout to enhance fisheries in the more accessible and heavily fished rivers and streams, and a combination of fingerlings and legals in standing waters in the Grande Ronde River basin. These legal-sized yearling trout are released to create an instant fishery and to meet fishery objectives. Current programs are designed to enhance fishery opportunities in areas where natural production of trout can not meet fishery demands. Human population increases and the loss of traditional salmon and steelhead harvest has increased pressure on trout populations. Bear Creek, Catherine Creek, upper sections of the Grande Ronde River, the Wallowa River, Lostine River, and Prairie Creek are currently stocked and contain both hatchery trout and self-sustaining populations of wild redband trout.

Approximately 135,000 fingerling rainbow, 105,000 at 20/lb. and 30,000 at 12/lb., are transferred from Klamath Hatchery to Wallowa Hatchery each September. The fish are Cape Cod domestic rainbow trout stock. A portion of the fish are held for a short time and released as fingerlings in the fall. The remainder are raised to legal size (approximately 3/lb.) and released the following spring and summer.

Current release allocations of rainbow trout from Wallowa Hatchery into the Grande Ronde basin are summarized in Table 3.

Release numbers represent a single fall release for fingerlings while legal releases are generally spread over a wide range of time when fishing pressure is the greatest. Legal stocking in standing waters is initiated prior to the general trout season opening in late April.

Table 3. Current rainbow trout allocations from Wallowa Hatchery for the Grande Ronde River basin.

Waterbody	Section (river mile)	Time of release	Fish size (#/lb)	Release group size	Total number released
Kinney Lake	N/A	Sept.	20	5,000	5,000
Kinney Lake	N/A	April	3	4,000	4,000
Bear Creek	8-9	July	3	1,000	2,000
Lostine River	14-25	June-Aug	3	2,500	7,500
Marr Pond	N/A	Apr-May	3	500-1,000	2,500
Wallowa Lake	N/A	Apr-Aug	3	2,500-5,000	50,000
Wallowa Wildlife	N/A	Apr-May	3	500-1,000	3,500
Wallowa River	10-19	June-Aug	3	1,000	6,000
Victor Pond	N/A	Apr-May	3	1,000-2,500	2,500
Prairie Creek	2-6	June-July	3	1,000-2,500	5,000
Catherine Creek	18-26	June-Aug	3	500-1,000	5,000
Grande Ronde R.	165-192	June-Aug	3	2,000	7,000
Roulette Pond	N/A	Apr-May	3	500-1,000	3,000
Mac Pond	N/A	Apr-May	3	500-1,000	3,000
Total					106,000

Stocking in rivers and streams is initiated sometime after the season opens in late May depending on water conditions. Stream releases do not begin until river flows have subsided and there is a high probability that fish will remain in target areas where fishing pressure is the greatest. Local managers make the decision on when to begin legal trout releases. Legal rainbow stocking generally continues through August but may end earlier if water conditions deteriorate or the allocation is met. The allocation may be exceeded for standing waters but not for rivers and streams.

From 1977 through 1984, fingerling rainbow trout (four to five inches in length) from Oak Springs and Wizard Falls hatcheries (Oak Springs Domestic stock) were released into the lower Grande Ronde and Wallowa rivers to provide a trout fishery when numbers of naturally produced summer steelhead adults declined as a result of hydropower development and high harvest rates in the Snake and Columbia river systems. These releases ranged from 35,000 to 140,000. Large numbers of residual hatchery summer steelhead smolts have been using these areas in recent years and fingerling trout releases have been discontinued and catch and release regulations on wild trout have been adopted to encourage harvest of the residual summer steelhead.

Source and Origin of Broodstock: Fall spawning Oak Springs domestic stock fingerlings and Cape Cod domestic stock yearlings; both of which originated from the McCloud River in northern California in the late 1800's.

Angling and Harvest

Redband trout, found throughout the Grande Ronde River basin, are the most sought after trout species, and provide the bulk of the trout harvest. Residual summer steelhead from hatchery stocking programs make significant contributions to the rainbow trout fishery in the mainstem Grande Ronde and Wallowa rivers. Trout seasons on steelhead streams are opened in late May to protect steelhead smolts while they are migrating out of the basin.

During 1976, and 1979, evaluations of legal trout programs were conducted on the Lostine and Wallowa rivers, respectively. The evaluations revealed that exploitation of stocked legal rainbow exceeded 60% in the Lostine and Wallowa Rivers (Anderson 1982). Hatchery trout allocations for these streams have been reduced since this evaluation was conducted. During the evaluation, 10,000 trout were stocked in the Lostine, and 11,000 in the Wallowa. Current allocations are 7,500 and 6,000 for the Lostine and Wallowa Rivers, respectively. Angler effort on these streams has not been estimated in recent years but it has likely increased, therefore current exploitation rates could be at least as high as those measured in the late 70's. Angler exploitation of hatchery rainbow trout in the upper Grande Ronde River, Catherine, Bear, and Prairie creeks has not been evaluated.

Angler surveys on Wallowa Lake have been conducted annually since 1954. Most of these surveys concentrated on the intensive kokanee fishery in May and June. In 1987 and 1988, angler surveys were conducted during May through August and exploitation on stocked legal rainbow was estimated at 54% for this 4-month period in both years. Wallowa Lake has a year-round trout season and additional harvest occurs in fall, in a winter ice fishery, and in early spring prior to stocking. Total annual exploitation has not been estimated but likely exceeds 75%.

An ODFW creel survey estimated a catch rate of stocked legal-sized hatchery rainbow trout at 0.9 fish per hour on the Lostine River in 1976. In 1979 a catch rate of 1.0 fish per hour was estimated on the Wallowa River. These are considered acceptable rates by the Department and represent good utilization of the hatchery fish stocked in these areas. Current catch rates basin-wide are considered by the Department to be below this level and that an average catch rate of 1.0 fish per hour is not being provided in the Grande Ronde River basin, with the possible exception of the Wallowa River. Fisheries for stocked legal-sized trout on Catherine Creek and the upper Grande Ronde River have not been evaluated. The ODFW 1987 Trout Plan has a target of 40 percent utilization of hatchery legal-sized trout as the minimum acceptable to meet Department policy.

Regulations: General angling regulations for trout include: 1. Streams are open from late May through late October (the purpose of this late opening is to protect summer steelhead smolts), with a limit of five fish per day, six inch minimum length, with trout over 20 inches considered steelhead. In the portion of the Grande Ronde River from stateline (RM 39) to Rondowa (RM 82) only barbless hooks are allowed and all trout with adipose fin intact must be

released without removal from the water. 2. Lakes and ponds, with the exception of Kinney and Morgan lakes, are open the entire year with a limit of 10 fish per day, six inch minimum length, no more than five over 12 inches and of these no more than two over 20 inches may be kept. Kinney and Morgan lakes are open from the last weekend in April through October with the same bag limits.

Management Considerations

Redband trout are currently listed on the Oregon Sensitive Species List. The systematics of the species *O. mykiss* is a complicated issue and the classification in the Columbia River basin is unresolved.

In the Grande Ronde River basin there are four populations of indigenous redband trout (all isolated by major geological barriers). Maintaining the genetic integrity of the indigenous redband trout in Grande Ronde River basin is a primary concern. With the increases in release numbers it is unknown what effect the stocking of hatchery trout has had on the native redband trout in the Grande Ronde River basin. Currently the status of native redband trout in streams which contain summer steelhead is uncertain.

Current catch rates in most of the Grande Ronde River basin (with the possible exception of the Wallowa River) are below acceptable levels and an average catch rate of 1.0 fish per hour is not being provided .

Critical uncertainties:

- Redband trout are currently listed statewide as a sensitive species. Evidence indicates they may be widespread throughout the Columbia River basin but present and historic abundance is unknown. More information is needed to determine classification of redband trout in the Grande Ronde River basin.
- The affect of large releases of summer steelhead on resident trout is unknown.
- Additional information on angler harvest, location of harvest, and whether harvest is a limiting factor is necessary.
- Information on abundance, distribution, and life history patterns of redband trout is limited.
- The effects of angling regulations on the redband trout population in the Grande Ronde River basin is unknown.
- The effects of hatchery trout released and resident trout fisheries on other fish species (e.g. chinook salmon) are unknown.

KOKANEE

Life History and Population Characteristics

Kokanee are native to Wallowa Lake and the mainstem Wallowa River and tributaries above the lake. Wallowa Lake kokanee support an important sport fishery in Northeast Oregon. In general kokanee may spawn from August to February in temperatures ranging from 41° F. to 51° F. Spawning in the Wallowa River occurs from September through November with peak spawning in mid-September. Female kokanee may dig more than one redd and spawn with more than one male, and males may spawn with more than one female. Samples from Wallowa Lake indicate that size at maturity is as small as 6.5 inches and the mean number of eggs is 300 to 400 with a range from 200 to 1000 eggs per female depending on size.

Historic records of angler harvested kokanee and samples from spawning areas in the Wallowa river indicate that Wallowa Lake kokanee rarely exceeded 10 inches in length. Since 1985, however, a small percent of kokanee ranging from 12 inches to 20 inches have been observed in angler catches and on the spawning grounds (Wallowa Fish District Annual Reports 1991).

Kokanee are found mostly in open water habitats and feed mainly on plankton and bottom dwelling organisms (Scott and Crossman 1973). Samples of kokanee stomachs from Wallowa Lake indicate that plankton and aquatic insects (mainly midges) dominate kokanee diets.

Natural Production: Wallowa Lake supported a natural run of sockeye salmon until 1916 when a dam was completed that totally restricted fish passage into the lake. Since then a naturally reproducing population of landlocked sockeye salmon (kokanee) has been present in Wallowa Lake. The population has been periodically supplemented with stocking of hatchery kokanee because of disturbances to spawning habitat resulting from channalization of the river in the state park above Wallowa lake.

During the years 1965 through 1967, 390,000 opossum shrimp (*Mysis relicta*) were stocked in Wallowa Lake to improve the food base for kokanee. The *Mysis* were transported from Upper Waterton Lake, Alberta Canada. Trawl sampling in 1968 and 1972 yielded only 5 and 2 *Mysis*, respectively, so it was believed that the introduction was not successful. *Mysis* was observed in stomachs of several kokanee from anglers' catches in 1986 and in follow-up sampling with a half-meter plankton net, indicating that the population has become established. It was not until 1986 that changes to the kokanee population became apparent. Since 1986 angler catch rate (used as an index of abundance) has declined. Indications are that *Mysis* are currently impacting kokanee production.

Hatchery production: In 1925 releases of fingerling kokanee were begun at Wallowa Lake (Appendix A Table 1). From 1925 through 1941 kokanee releases were composed of native stock collected at Wallowa Lake. During the years 1942 to 1954 non-native stock kokanee were planted in Wallowa Lake for the first time from unknown populations. Since

1955, stocks from Montana, Washington, and British Columbia have been utilized (Cramer 1990).

Angling and Harvest

Between the years of 1954 and 1990 kokanee contributions to anglers on Wallowa Lake have been monitored. Annual harvest has been as low as 303 and as high as 32,862 kokanee (Cramer 1990). Based on creel surveys conducted by the ODFW from 1980 through 1987 the May through June fishery for kokanee averaged approximately 20,000 angler hours of effort and a harvest of approximately 23,000 kokanee annually. Angler effort and harvest data are presented in Appendix A Table 2.

Regulations: General regulations for trout in lakes apply (see rainbow trout regulations section).

Management Considerations

Wallowa Lake supports one of the most important sport fisheries in the Grande Ronde River basin. The May-June fishery for kokanee averaged approximately 20,000 angler hours of effort and a harvest of approximately 23,000 kokanee annually based on creel surveys conducted by the District from 1980 through 1987. The fishery has been maintained by natural production of native kokanee and periodic stocking continued through 1982. An aggressive stocking program was conducted in 1965-70 in response to reduced natural production resulting from channalization of spawning grounds in the Wallowa River.

The establishment of *Mysis* and associated changes in zooplankton communities has had varying impacts on kokanee populations and fisheries. Results ranged from the establishment of a trophy kokanee fishery in the west arm of Kootenay Lake (Lasenby et al. 1986) to the total collapse of kokanee populations in Priest Lake, Idaho, (Bruce Rieman, Idaho Fish and Game, personal communication) and Whitefish Lake, Montana, (Rumsey 1988). In Pend Oreille and Flathead Lakes kokanee populations were severely depressed but not eliminated (Rieman and Bowler 1980; Beattie et al. 1990) however, harvest in fisheries declined to a fraction of historical levels. Rumsey (1988) reported that while severe declines in kokanee populations were observed in some western Montana lakes following *Mysis* establishment (i.e. Flathead and Whitefish Lakes), others such as Ashley, Little Bitterroot, and Swan Lakes support large numbers of kokanee despite the presence of Mysis populations. We remain unsure of the relationship between the establishment of *Mysis* and the changes we observe in the kokanee population in Wallowa Lake. There is a concern that *Mysis* establishment may reduce the quality of the kokanee fishery in Wallowa Lake. Changes to date in Wallowa Lake kokanee include an increase in maximum size and declining catch rate. The kokanee-*Mysis* interaction must be closely monitored.

Critical uncertainties:

- Data collected to date on kokanee-*Mysis* interactions in Wallowa Lake are inconclusive. Additional information is needed to assess the impacts of *Mysis* with the recent declines in the kokanee fishery.
- A determination needs to be made as to whether lake trout are a limiting factor on kokanee.
- Additional information on kokanee abundance, exploitation rates, and whether harvest is a limiting factor is needed.
- Information on abundance, distribution, and life history patterns of kokanee is limited to creel survey data. More information on early life history is needed.
- The impacts of kokanee hatchery population releases are unknown. A determination must be made as to the impacts on genetics regarding the possible uses of kokanee for sockeye salmon culture in reintroduction efforts of sockeye salmon in the Grande Ronde River basin.
- Mitigation measures need to be developed to assure adequate spawning habitat for kokanee will be available in the event of future flood control activities in the Wallowa River.
- The effect of a sewer system, installed in 1987, on the productivity of Wallowa Lake is unknown.

BULL TROUT

Systematics

The systematics of bull trout have been studied by Leary et al (1991). There probably are at least two undescribed subspecies, one in the Columbia River basin and the second in the Klamath basin. These subspecies are distinguished from each other by allozyme characteristics. The level of genetic variation between populations within the ranges of each subspecies is also substantial. This level of within-basin differentiation indicates that there is little or no gene flow between populations. This pattern may have resulted from population fragmentation and loss of intermediate populations, as well as local adaptations. The Columbia River basin subspecies includes, at least in recent ancestry, both resident and migratory forms. The migratory form has been lost from many subbasins.

The Grande Ronde River bull trout is in the Columbia River basin subspecies. It still contains both migratory and resident forms. The migratory form apparently migrates to the Snake River. The Grande Ronde River resident form was sampled in the Leary study. The migratory morph has not been studied but it is suspected that the resident and migratory forms are not reproductively isolated from each other. The migrants may also provide gene flow between the Grande Ronde River basin and Imnaha River basin populations.

There are two known bull trout populations in the Grande Ronde River basin that are isolated by geological barriers; 1. located in Limberjim Creek (tributary to the upper Grande Ronde River) and 2. Hurricane Creek (tributary to the Wallowa River). The systematic relationship between these isolated populations and the other populations in the Grande Ronde River basin is unknown.

Life History and Population Characteristics

Bull trout prefer cool waters of less than 60° F. with plenty of oxygen. Growth varies greatly, depending on such factors as water temperature, water chemistry, and food supply. Bull trout spawn in the fall and prefer water temperatures between 42° F. and 44° F. Depending on growth rate, bull trout mature at five or six years of age (Wydoski and Whitney 1979). There are both resident and fluvial (migratory) populations of bull trout present in the Grande Ronde River basin.

Natural Production:

Distribution: Distribution of bull trout in winter months is believed to be wide-spread throughout the Grande Ronde River basin although winter distribution needs further study. Large bull trout are caught below Troy on the lower Grande Ronde River in September and October by summer steelhead anglers. Summer distribution is limited to the upper reaches and tributaries of the Wenaha, Minam, Lostine, and upper Grande Ronde rivers, and Catherine, Hurricane, Bear, Little Bear, Deer, Clark, Indian, and Lookingglass creeks. Historically Wallowa Lake contained an adfluvival population of bull trout. This populations extinction is due to an active eradication program by the Department (Rayner 1946) in the 1940's and 1950's due to concerns at the time for predation on salmon.

Interspecific relationships: Bull trout and introduced brook trout co-exist in the Minam, Lostine, and upper Grande Ronde rivers, Hurricane Creek and Bear Creek, which is cause for concern. They can interbreed and produce sterile hybrid offspring (Leary et al 1991). Brook trout mature at an earlier age than bull trout and have a reproductive advantage. Brook trout juveniles emerge earlier than bull trout young and besides being less vulnerable to angling they have less stringent habitat requirements and can out-compete bull trout in some habitats (Bjornn 1991).

Trends in Abundance: Bull trout populations and habitat in Lookingglass and Deer creeks, and the Minam and Wenaha rivers appear to be in stable condition based on incidental creel records and fish observations. These areas are either in wilderness areas or pristine/roadless drainages. However, populations in Catherine Creek and the upper Grande Ronde River appear to be confined to isolated areas in the headwaters which have not been affected by logging activities or exposed to high angling pressure. Water temperature and quality in these reaches must be protected. In areas with large brook trout populations, bull trout are thought to be either absent or are found only in the steep gradient and cold water areas not suitable for brook trout.

Survival Rates: There are many factors affecting bull trout populations including water temperature, hybridization with brook trout, angling pressure, cover, availability of forage,

water quality, amount and quality of substrate, and sedimentation. To date there are no estimates of bull trout survival rates in the Grande Ronde River system.

Hatchery production: No hatchery production of bull trout occurs in the Grande Ronde River basin.

Release Numbers and Location By Stream: Bull trout were released in Wallowa Lake and River from 1964 through 1978. This was an unsuccessful attempt to reintroduce them into Wallowa Lake (Appendix A Table 3).

Angling and Harvest

Regulations: In ODFW Northeast zone streams the daily catch limit is two bull trout over 6 inches from late May through October.

Management Considerations

Bull trout are currently listed on the Oregon Sensitive Species List and are petitioned for listing under the Endangered Species Act. In the Grande Ronde River basin there are two populations of indigenous bull trout isolated by major geological barriers. Maintaining the genetic integrity of the native bull trout in the Grande Ronde River basin is a primary concern. It is unknown what effect the stocking of hatchery trout has had on the native bull trout in the basin. Bull trout and brook trout co-exist in many areas which is cause for concern. Currently the status of indigenous bull trout is uncertain especially in streams which contain brook trout and there are currently no estimates of bull trout survival rates in the system.

Summer distribution is limited to upper river reaches and tributaries and (although winter distribution for bull trout needs further study), distribution in winter months is believed to be wide-spread throughout the Grande Ronde River basin.

In wilderness areas or in pristine/roadless drainages in the Grande Ronde River basin bull trout populations appear to be in stable condition. However, populations in rivers and streams that have been affected by logging activities, exposed to high angling pressure, or brook trout introduction appear to be confined to isolated headwater areas.

Critical uncertainties:

- Knowledge of the distribution, abundance, and life history of bull trout in the Grande Ronde River basin is incomplete.
- The extent of bull trout/brook trout hybridization occurring in the Grande Ronde River basin is unknown.
- Additional information on angler harvest, location of harvest, and whether harvest is a limiting factor is necessary.

- Habitat conditions limiting bull trout distribution in the basin is unknown.

BROOK TROUT

Life History and Population Characteristics

Brook trout are native to the Eastern United States and were introduced into the Grande Ronde River basin in the late 1800's. This species of trout spawns in the fall and most mature at three years of age. They are usually short-lived with few wild fish living beyond five years of age (Scott and Crossman 1973). Brook trout are also slow growing and many populations are prone to stunting, especially in small headwater streams and lakes. Brook trout prefer cool, clear headwater streams and mountain lakes with preferred water temperatures ranging from 55° F. to 68° F. (Wydoski and Whitney 1979).

Natural Production:

Distribution: Brook trout are found in many Wallowa Mountain lakes (Table 4 in the High Lakes section) and streams, spring-fed Wallowa valley streams, the upper Minam River and tributaries, upper Grande Ronde River streams, and irrigation ditches.

Hatchery production: There is currently no hatchery supplementation of brook trout in the Grande Ronde River.

Release Numbers and Location By Stream: Eastern brook trout were stocked in many lakes and streams in the past and all lakes listed under basic yield brook trout in the alternatives section have been previously stocked (Appendix A Table 4).

Angling and Harvest

Regulations: There are no minimum or maximum length limits on brook trout in the Grande Ronde River basin. General catch limit regulations for trout apply (see rainbow trout regulations section).

Management Considerations

Brook trout are an exotic trout species and were introduced into the basin within the last one hundred years and they are now found in many lakes and streams in the Grande Ronde River basin. Brook trout are slow growing and prefer cool, clear headwater streams which leads to direct competition with indigenous bull trout.

Critical uncertainties:

- Is the distribution of brook trout in the Grande Ronde River basin expanding?

- Additional information on angler harvest and location of harvest is necessary.
- Information on abundance, distribution, and life history patterns of brook trout is limited.
- Areas of overlap in distribution and hybridization with bull trout need to be identified.

LAKE TROUT

Life History and Population Characteristics

Lake trout are native to north central and eastern United States and Canada. They prefer water temperatures of 50° F. and most mature at five to seven years of age. Lake trout spawn in the fall (they are broadcast spawners) (Wydoski and Whitney 1979). In Oregon there are records of lake trout over 30 years of age. They prey on kokanee, mountain whitefish, and rainbow trout in Wallowa Lake.

Natural Production:

Distribution: Lake trout are located only in Wallowa Lake. Limited information from angler harvest indicates a small but self-sustaining population.

Hatchery production: There is currently no hatchery supplementation of lake trout in the Grande Ronde River basin.

Release Numbers and Location By Stream: The earliest recorded lake trout release into Wallowa Lake was in 1917. In June and July 1917, 157,328 lake trout were released into the lake (ODFW Files 1967). Lake trout liberations are shown in Appendix A Table 5.

Angling and Harvest

Recent harvest data depict a low-yield, trophy fishery with most fish in the 20 to 30 pound range.

Regulations: General regulations for trout in lakes apply.

Management Considerations

Lake trout are an important component of the fishery in Wallowa Lake. The angling effort and catch for all species of trout in the lake must be monitored and close attention must be paid to the interaction between *Mysis* and other species.

Critical uncertainties:

- Information on abundance, distribution, and life history patterns including age and size of first spawning of lake trout is limited.
- A determination needs to be made as to whether kokanee are a limiting factor on lake trout.
- Additional information on angler harvest, location of harvest, and whether harvest is a limiting factor is necessary.

GOLDEN TROUT

Life History and Population Characteristics

Golden trout are native to Sierra Nevada in California and are suspected to exist in a few high lakes of the Grande Ronde River basin from introductions prior to 1958. These trout originated from lakes with elevations from 10,000 feet and survive the best in waterbodies with elevations over 7,000 to 8,000 feet. This species begins spawning behavior when the water temperature raises towards 50° F. Golden trout mature at three and four years of age, spawn in the summer, and can live over seven years in some waters (Wydoski and Whitney 1979). This species of trout needs a stream system to be able to spawn successfully. In many cases the golden trout introduced in this areas did not keep their unique colorations.

Natural Production:

Distribution: Golden trout were introduced into Hobo and Prospect lakes in 1929, and introduced into Swamp and Wood lakes prior to 1940. Present abundance and distribution in Grande Ronde River system and high mountain lakes is unknown.

Hatchery production: There is currently no hatchery supplementation program for golden trout in the Grande Ronde River basin or anywhere else in Oregon. There was difficulty in maintaining broodstocks and in getting eggs from California but one of the main reasons the stocking program was discontinued is the fact that in the Wallowa Mountain Lakes there is limited spawning opportunities.

Release Numbers and Location By Stream: Golden trout releases are shown in Appendix A Table 6.

Angling and Harvest

Regulations: General regulations for trout apply.

Management Considerations

Golden trout inhabit waters at elevations above 7,000 and are a species of trout that are actively sought after by many people. High lake inventories must be improved and expanded to determine which lakes are inhabited by golden trout. An acceptable source for stocking purposes must also be found if additional stocking is to be considered in the future.

Critical uncertainties:

- It is uncertain whether golden trout are present in the Grande Ronde River basin at the present time.
- Additional information on angler harvest, location of harvest, and whether harvest is a limiting factor is necessary.
- Determine whether a new effort to stock golden trout in the Grande Ronde River basin will provide satisfactory benefits?
- Information on abundance, distribution, and life history patterns of golden trout is limited.

CUTTHROAT TROUT

Life History and Population Characteristics

Natural Production: Cutthroat trout prefer cold clear water with temperatures of 49° F. to 55° F. They need to have access to a stream to spawn.

Distribution: The only location in the Grande Ronde River basin where cutthroat trout are present is in Frances Lake. These fish are westslope cutthroat from Twin Lakes in Washington introduced into Frances Lake in 1990.

Hatchery Production: Wild westslope cutthroat trout eggs are collected annually from Twin Lakes Washington. Eggs are shipped annually to Oregon hatcheries (Marion Forks hatchery).

Release Numbers and Location By Stream: Cutthroat trout historically were released in lakes and streams in the Grande Ronde River basin (Appendix A Table 7). The Department has no recent records of the presence of cutthroat trout (other then those stocked in Frances Lake). Most of the fish stocked were of unknown origin. Mann Lake cutthroat trout were the stock of origin for the plant in Minam Lake in 1962, Montana cutthroat trout were the stock of origin used when Hatchery Lake was stocked in 1948, and also for Wallowa Lake in 1938, 1941, and 1942.

Angling and Harvest

Regulations: General regulations for trout in lakes apply.

Management Considerations

In 1990 Twin Lakes westslope cutthroat trout were released into Frances Lake. This lake has no outlet (it is an isolated lake) and therefore fish can not leave and establish a population downstream and impact native trout populations.

Critical uncertainties:

- Is there enough inventory information to determine that westslope cutthroat trout are not native in portions of the Grande Ronde River basin, especially in areas close to the John Day River basin?
- It is unknown if previous introductions of cutthroat trout were unsuccessful,
- Determine whether an effort to stock cutthroat trout in other isolated low-risk waterbodies in the Grande Ronde River basin is feasible?

MOUNTAIN WHITEFISH

Life History and Population Characteristics

Mountain whitefish are native to the Grande Ronde River basin. They live in both flowing and standing waters, and prefer cool water of good quality. Generally they inhabit large streams with average temperatures of 48° F. to 52° F., but are also found in waters reaching 70° F. They are normally found midstream on riffles or in deep pools rather than close to stream edges or bottom cover. They mature in three to six years, and broadcast spawn in late fall and early winter. Length at maturity ranges from 10 to 24 inches, depending on their location within the Grande Ronde River basin. After spawning, large numbers congregate in deep slow pools where they often remain through the winter months.

Natural Production:

Interspecific relationships: Mountain whitefish are abundant in the Grande Ronde River basin in areas of suitable habitat. Competition with other fish species likely does not limit mountain whitefish abundance.

Hatchery production: No hatchery production of mountain whitefish occurs in the Grande Ronde River basin.

Angling and Harvest

Larger rivers such as the Wallowa and Grande Ronde rivers are fished for mountain whitefish. This species is very abundant and currently underutilized.

Regulations: Mountain whitefish may be caught from any water open to salmon, steelhead, or trout angling with no catch limit.

Management Considerations

Whitefish are abundant in the Grande Ronde River basin and are underutilized in the sport fishery. This population could support a substantial fishery and provide additional angling diversity. Mountain whitefish may be an important prey species for bull trout in the basin.

Critical uncertainties:

- The impact of increased production of anadromous salmonids on mountain whitefish in the Grande Ronde River basin is not known.

Major Management Problems and Issues

1. Hatchery trout and steelhead programs support major consumptive fisheries in the Grande Ronde River basin. Current information on interactions between hatchery trout and wild trout populations is not adequate for a basin-wide assessment of Wild Fish Management Policy compliance.

2. Wallowa Lake provides the only large lake angling opportunity in the Grande Ronde River basin. The lake is very popular area for vacationing and tourism. Wallowa Lake supports a trophy lake trout fishery, a basic yield kokanee fishery, and an intensive use rainbow trout fishery. The recent decline in the kokanee fishery is a major concern.

Management Alternatives

Management of the Grande Ronde River basin is divided into five management sections: The Upper Grande Ronde River and tributaries, Lower Grande Ronde and Wallowa rivers and tributaries, Wallowa Lake, High Lakes, and Small Ponds and Other High Intensity Lakes. Each section contains individual sets of Alternatives, Policies, Objectives, Assumptions and Rationale, and Actions.

Two alternatives for management of resident trout and mountain whitefish in the Grande Ronde River basin were developed for each management section except the sections on High Lakes and Small Ponds and Other High Intensity Lakes which have only one

alternative because there are no wild fish present now or historically. In the following sections two management alternatives are examined which will be used to achieve compliance with the Wild Fish Management Policy. Both alternatives call for modifications to the present management program.

Alternative 1 places priority on maintaining natural production, habitat protection and enhancement, and protecting the genetic and life history characteristics of the wild redband trout, bull trout, and mountain whitefish populations. Hatchery trout shall not be released in the Grande Ronde River basin and fisheries will be supported exclusively by natural production.

Alternative 2 provides protection of genetic and other characteristics of wild populations but still allows hatchery releases in some areas to maintain current fisheries. Alternative 2 provides more harvest opportunities and greater angling diversity (although at a greater cost i.e., potential increased harvest impacts on wild fish in addition to the cost of hatchery fish production) through the release of hatchery rainbow trout in specified areas while protecting or enhancing production of wild trout. The Cape Cod and Oak Springs rainbow trout stocks are currently used in Grande Ronde River basin. These nonindigenous broodstocks are believed to contribute minimally to natural production because of suspected low survival of yearlings in the wild and differences in spawning timing between the hatchery stocks and indigenous populations.

Grande Ronde River basin interior "redband" rainbow trout and bull trout are listed by the ODFW and USFWS as sensitive species due to declines in abundance and distribution and insufficient information regarding their status. Inventory and monitoring activities included under Alternatives 1 and 2 will provide needed information to determine their status in the Grande Ronde River system.

Actions listed under an objective must be completed in order for an objective to be met. Many of the actions cannot be accomplished under current levels of funding. If ODFW funding is unavailable, the Department will seek alternative sources of funding. If funding continues to be limiting, the Department will pursue actions according to priority as funds become available.

Our intention with the direction of this plan under both Alternative 1 and 2 is to restore habitat by enhancing flows, water quality, and diversity of instream structure and providing better protection of instream diversity. Under Alternative 2 monitoring will be conducted to determine the benefits of hatchery fish to the fisheries and the ratio of hatchery to wild fish on natural spawning areas.

Upper Grande Ronde River

Grande Ronde River and tributaries upstream from the confluence of the Wallowa River at Rondowa (RM 82 to RM 209) and the Wallowa River upstream from the confluence of Rock Creek (RM 18 to RM 50).

Alternative 1

Policies

Policy 1. **Bull trout shall be managed for natural production consistent with the Wild Fish Management Alternative for trout (ODFW 1987b). No hatchery bull trout shall be stocked.**

Policy 2. **Indigenous wild redband trout, mountain whitefish, and introduced brook trout shall be managed for natural production consistent with the Basic Yield Management Alternative for trout (ODFW 1987b). No hatchery trout shall be stocked.**

Objectives

Objective 1. **Maintain the genetic diversity, adaptiveness, and abundance of wild indigenous redband trout, mountain whitefish, bull trout, and introduced brook trout in the Upper Grande Ronde River.**

Assumptions and Rationale

1. This subbasin supports wild redband trout, bull trout, brook trout, and mountain whitefish.

2. Indigenous Grande Ronde River rainbow trout are classified as an inland redband trout and have been classified as a sensitive species.

3. Bull trout in the Grande Ronde River basin have been classified as a sensitive species and petitioned for listing under the Endangered Species Act.

4. Wild redband trout are distributed through out the Grande Ronde River basin.

5. The current level of bull trout distribution and abundance is unknown but likely at depressed levels in some areas.

6. Bull trout mature at a relatively old age (six to seven years of age) and are vulnerable to overharvest by angling.

7. Bull trout are vulnerable to hybridization with brook trout where they co-exist.

8. Monitoring the distribution and abundance of mountain whitefish, rainbow, bull, and brook trout populations will provide an indication of their health and adaptiveness.

9. Lack of suitable trout habitat resulting from past and present land and water use management practices limits the ability of the Upper Grande Ronde River system to provide optimal spawning and rearing habitat.

Actions

Action 1.1 Monitor trends in redband trout, brook trout, bull trout, and mountain whitefish distribution and abundance in selected index reaches and verify and document their year around distribution.

Action 1.2 Assess the status of sensitive redband trout and bull trout in the Upper Grande Ronde River. Determine and prioritize future work on limiting factors for such items as instream habitat, harvest, and interactions with introduced species i.e., brook trout.

Action 1.3 Develop and implement a cooperative enforcement and information and education program with OSP to ensure compliance with angling regulations to protect sensitive, threatened, and endangered fish species.

Action 1.4 Develop base-line data on genetic and phenotypic characteristics of redband and bull trout with the use of biochemical and meristic parameters.

Action 1.5 Work with USFS, private forest owners, interested Indian Tribes, and other appropriate land management agencies in the development of a bull trout recovery plan in appropriate streams of the Upper Grande Ronde River system. Determine and prioritize future work on limiting factors for such items as instream habitat, harvest, and interactions with introduced species i.e., brook trout.

Action 1.6 Determine impacts of residual hatchery steelhead on wild trout populations and modify hatchery programs if necessary to maintain Wild Fish Management Policy compliance.

Objective 2. Provide diverse angling opportunities for wild redband trout, brook trout, bull trout, and mountain whitefish in the Upper Grande Ronde River.

Assumptions and Rationale

1. Management under this alternative seeks to provide a diversity of angling opportunities including both non-consumptive and consumptive use of wild trout.

2. Special regulations may be necessary to protect stock fitness, life history characteristics, and healthy trout populations with multiple age classes.

3. Mountain whitefish populations levels are adequate to support an increased sport fishery.

4. Many people are not aware of the sport and food fish qualities of mountain whitefish.

5. Wild redband trout are distributed throughout the Upper Grande Ronde River.

6. Current bull trout distribution and abundance is not entirely known but is likely at depressed levels in some areas.

7. Management under this alternative will likely result in reductions in consumptive harvest and more restrictive regulations in some areas.

Actions

Action 2.1 Evaluate angling pressure and harvest rates of trout through creel surveys on key stream reaches to determine consumptive use and impacts on wild populations, and to determine the need for additional or modified angling regulations.

Action 2.2 Implement a cooperative enforcement and information and education program with OSP to insure compliance with regulations.

Action 2.3 Develop an information and education program to enhance angler awareness of sensitive species such as bull and redband trout where these unique populations occur.

Action 2.4 Post signs at popular fishing sites informing anglers on how to identify and correctly release rainbow and bull trout.

Action 2.5 Evaluate the need for special closures to protect sensitive, threatened, and endangered species such as redband and bull trout and spring chinook salmon.

Action 2.6 Encourage utilization of the brook trout and mountain whitefish resource in the basin.

Action 2.7 Minimize the harvest impacts that trout fisheries have on wild juvenile summer steelhead.

Action 2.8 Minimize wild summer steelhead smolt and pre-smolt harvest while allowing harvest of wild trout. Encourage harvest of residual summer steelhead juveniles.

Alternative 2

Policies

Policy 1. **Rainbow trout shall be managed for hatchery and natural production consistent with the Basic Yield Management Alternative for trout (ODFW, 1987b).**

Policy 2. **Bull trout, brook trout, and mountain whitefish shall be managed for natural production consistent with the Wild Fish Management Alternative for trout (ODFW 1987b). No hatchery bull trout, brook trout, or mountain whitefish shall be stocked in the Upper Grande Ronde River basin.**

Policy 3. **Releases of hatchery rainbow trout shall be confined to the following streams and river reaches:**

Mainstem Grande Ronde River (RM 165 to 191)

Catherine Creek (RM 16 to 26)

Lostine River (RM 14 to 26)

Bear Creek (RM 7 to 9)

Prairie Creek (RM 0 to 4)

Wallowa River (RM 10 to 20)

Objectives

Objective 1. **Maintain the genetic diversity, adaptiveness, and abundance of wild redband trout, mountain whitefish, bull trout, and introduced brook trout in the Upper Grande Ronde River basin.**

Assumptions and Rationale

1. This subbasin supports wild redband trout, bull trout, brook trout, and mountain whitefish.

2. Indigenous Grande Ronde River rainbow trout are classified as an inland redband trout and have been identified as a sensitive species.

3. Bull trout in the Grande Ronde River basin have been classified as a sensitive species.

4. Releases of hatchery trout near areas where spawning wild trout occur may decrease genetic fitness of wild trout populations if they compete or interbreed.

5. Wild redband trout are distributed through out the Upper Grande Ronde River basin.

6. Current information on bull trout distribution and abundance is incomplete but they may be depressed in some areas.

7. Bull trout mature at a relatively old age (six to seven years of age) and are vulnerable to overharvest by angling.

8. Bull trout are vulnerable to hybridization with brook trout where they co-exist.

9. Monitoring the distribution and abundance of wild mountain whitefish, redband trout, bull trout, and brook trout populations will provide an indication of their health and adaptiveness.

10. Lack of suitable trout habitat resulting from past and present land and water use management practices limits the ability of the Grande Ronde River system to provide optimal spawning and rearing habitat.

Actions

Action 1.1 Monitor trends in wild redband trout, brook trout, bull trout, and mountain whitefish distribution and abundance in selected index reaches and document their year around distribution.

Action 1.2 Assess the status of sensitive redband trout and bull trout in the Upper Grande Ronde River. Determine and prioritize future work on limiting factors for such items as instream habitat, harvest, and interactions with introduced species i.e., brook trout.

Action 1.3 Develop and implement a cooperative enforcement and information and education program with OSP to ensure compliance with angling regulations to protect sensitive, threatened, and endangered fish species.

Action 1.4 Establish base-line data on genetic and phenotypic characteristics of wild redband and bull trout with the use of biochemical and meristic parameters.

Action 1.5 Work with USFS, private forest owners, interested Indian Tribes, and other appropriate land management agencies in the development of a bull trout recovery plan in appropriate streams of the Grande Ronde River system. Determine and prioritize future work on limiting factors for such items as instream habitat, harvest, and interactions with introduced species i.e., brook trout.

Action 1.6 Determine impacts of residual hatchery steelhead and hatchery trout on wild trout populations and modify hatchery programs if necessary to maintain Wild Fish Management Policy compliance.

Objective 2. Provide a fishery for naturally produced and hatchery supplemented redband trout and naturally produced bull trout, brook trout, and mountain whitefish.

Assumptions and Rationale

1. Management under this alternative seeks to provide a diversity of angling opportunities including both non-consumptive and consumptive use of wild trout.

2. This subbasin supports wild redband trout, bull trout, brook trout, and mountain whitefish.

3. Current information on bull trout distribution and abundance is incomplete but they may be depressed in some areas.

4. Special regulations may be necessary to protect stock fitness, life history characteristics, and general health of trout populations.

5. Trout fisheries currently provide an acceptable fishery given the current level of angler use and abundance of trout.

6. Mountain whitefish populations levels are adequate to support an increased sport fishery.

7. Many people are not aware of the sport and food fish qualities of mountain whitefish.

8. Wild redband trout are distributed through out the Upper Grande Ronde River.

9. Current bull trout distribution and abundance is not entirely known but is likely at depressed levels in some areas.

10. The current hatchery rainbow trout program uses Cape Cod domestic stock.

Actions

Action 2.1 Continue to release up to 7,000 legal-size hatchery rainbow trout in the Mainstem Grande Ronde River from RM 165 to 195 during summer high use period.

Action 2.2 Continue to release up to 5,000 legal-size hatchery rainbow trout in Catherine Creek from RM 16 to 26 during summer high use period.

Action 2.3 Continue to release up to 7,500 legal-size hatchery rainbow trout in the Lostine River from RM 14 to 26 during summer high use period.

Action 2.4 Continue to release up to 2,000 legal-size hatchery rainbow trout in Bear Creek from RM 7 to 9 during summer high use period.

Action 2.5 Continue to release up to 2,500 legal-size hatchery rainbow trout in Prairie Creek from RM 0 to 4 during summer high use period.

Action 2.6 Monitor angling pressure and harvest of hatchery and naturally produced trout through periodic creel surveys.

Action 2.7 Adjust stocking levels to maintain a return to the angler of at least 40% from hatchery rainbow trout released into the Grande Ronde River and tributaries.

Action 2.8 Implement a cooperative enforcement and information and education program with OSP to insure compliance with regulations.

Action 2.9 Develop an information and education program to enhance angler awareness of sensitive species such as bull and redband trout where unique populations occur.

Action 2.10 Post signs at popular fishing sites informing anglers on how to identify and correctly release wild redband, and bull trout.

Action 2.11 Evaluate the need for special closures to protect sensitive, threatened, and endangered species such as redband and bull trout and spring chinook salmon.

Action 2.12 Minimize wild summer steelhead smolt and pre-smolt harvest while allowing harvest of hatchery and wild trout. Encourage harvest of residual hatchery summer steelhead juveniles.

Action 2.13 Encourage utilization of the mountain whitefish resource in the basin.

Lower Grande Ronde River

Grande Ronde River from Rondowa to state line (RM 82 to RM 39) and Mainstem Wallowa River from Rock Creek downstream to its mouth at Rondowa (RM 18 to RM 0).

Alternative 1

Policies

Policy 1. **Mountain whitefish and introduced brook trout shall be managed for natural production consistent with the Basic Yield Management Alternative for trout (ODFW 1987b). No hatchery trout shall be stocked.**

Policy 2. **Bull trout and redband trout shall be managed for natural production consistent with the Wild Fish Alternative for trout (ODFW 1987b). No hatchery trout shall stocked.**

Objectives

Objective 1. **Maintain the genetic diversity, adaptiveness, and abundance of wild indigenous redband trout, mountain whitefish, bull trout, and introduced brook trout.**

Assumptions and Rationale

1. This subbasin supports wild redband trout, bull trout, brook trout, and mountain whitefish.

2. Indigenous Grande Ronde River rainbow trout are classified as an inland redband trout and have been identified as a sensitive species.

3. Bull trout in the Grande Ronde River basin have been classified as a sensitive species.

4. Releases of hatchery trout near areas where spawning wild trout occur may decrease genetic fitness of wild trout populations if they interbreed.

5. Wild redband trout are distributed through out the Lower Grande Ronde River basin.

6. The current level of bull trout distribution and abundance is unknown but likely at depressed levels.

7. Bull trout mature at a relatively old age (six to seven years of age) and are vulnerable to overharvest by angling.

8. Bull trout are vulnerable to hybridization with brook trout where they co-exist.

9. Monitoring the distribution and abundance of mountain whitefish, redband trout, bull trout, and brook trout populations will provide an indication of their health and adaptiveness.

10. Lack of suitable trout habitat resulting from past and present land and water use management practices limits the ability of the lower Grande Ronde River system to provide optimal spawning and rearing habitat.

Actions

Action 1.1 Monitor trends in redband trout, brook trout, bull trout, and mountain whitefish distribution and abundance in selected index reaches and verify and document their year around distribution.

Action 1.2 Assess the status of sensitive redband trout and bull trout in the Lower Grande Ronde River. Determine and prioritize future work on limiting factors for such items as instream habitat, harvest, and interactions with introduced species i.e., brook trout.

Action 1.3 Develop and implement a cooperative enforcement and information and education program with OSP to ensure compliance with angling regulations to protect sensitive, threatened, and endangered fish species.

Action 1.4 Establish base-line data on genetic and phenotypic characteristics of redband and bull trout with the use of biochemical and meristic parameters.

Action 1.5 Work with USFS, private forest owners, interested Indian Tribes, and other appropriate land management agencies in the development of a bull trout recovery plan in appropriate streams of the Grande Ronde River system. Determine and prioritize future work on limiting factors for such items as instream habitat, harvest, and interactions with introduced species i.e., brook trout.

Action 1.6 Determine impacts of residual hatchery steelhead and trout on wild trout populations and modify hatchery programs if necessary to maintain Wild Fish Management Policy compliance.

Objective 2. Provide diverse angling opportunities for wild redband trout, brook trout, bull trout, and mountain whitefish in the Lower Grande Ronde River.

Assumptions and Rationale

1. Management under this alternative seeks to provide a diversity of angling opportunities including both non-consumptive and consumptive use of wild trout.

2. Special regulations may be necessary to protect stock fitness, life history characteristics, and healthy trout populations with multiple age classes.

3. Mountain whitefish populations levels are adequate to support an increased sport fishery.

4. Many people are not aware of the sport and food fish qualities of mountain whitefish.

5. Wild redband trout are distributed through out the Lower Grande Ronde River.

6. Current bull trout distribution and abundance is not entirely known but is likely at depressed levels in some areas.

7. Trout fisheries currently provide an acceptable fishery given the current level of angler use and abundance of trout.

Actions

Action 2.1 Evaluate angling pressure and harvest rates of trout through creel surveys on key stream reaches to determine consumptive use and impacts on wild populations, and to determine the need for additional or modified angling regulations.

Action 2.2 Implement a cooperative enforcement and information and education program with OSP to insure compliance with regulations.

Action 2.3 Develop an information and education program to enhance angler awareness of sensitive species such as bull and redband trout where unique populations occur.

Action 2.4 Post signs at popular sites informing anglers on how to identify and correctly release wild redband and bull trout.

Action 2.5 Evaluate the need for special closures to protect sensitive, threatened, and endangered species such as redband and bull trout and spring chinook salmon.

Action 2.6 Encourage utilization of the mountain whitefish resource in the basin.

Action 1.7 Minimize the harvest impact of trout fisheries on wild juvenile summer steelhead.

Alternative 2

Policies

Policy 1. **Wild redband trout shall be managed for natural production consistent with the Trophy Fish Management Alternative for trout (ODFW, 1987b).**

Policy 2. **Brook trout and mountain whitefish shall be managed for natural production consistent with the Basic Yield Management Alternative for trout (ODFW 1987b). No hatchery brook trout and mountain whitefish shall be stocked.**

Policy 3. **Bull trout shall be managed for natural production consistent with Wild Fish Management Alternative for trout (ODFW 1987b). No hatchery bull trout shall be stocked.**

Policy 4. **Hatchery rainbow trout shall be managed under the Intensive Use Management Alternative for trout (ODFW 1987b). Stocking of hatchery rainbow trout shall be limited to the mainstem Wallowa River from RM 10 to 18.5.**

Objectives

Objective 1. **Maintain the genetic diversity, adaptiveness, and abundance of wild indigenous redband trout, mountain whitefish, bull trout, and introduced brook trout.**

Assumptions and Rationale

1. This subbasin supports wild redband trout, bull trout, brook trout, and mountain whitefish.

2. Indigenous Grande Ronde River redband trout are classified as an inland redband trout and have been identified as a sensitive species.

3. Bull trout in the Grande Ronde River basin have been classified as a sensitive species.

4. Releases of hatchery trout near areas where spawning wild trout occur may decrease genetic fitness of wild trout populations if they compete or interbreed.

5. Wild redband trout are distributed through out the Lower Grande Ronde River basin.

6. Current bull trout distribution and abundance is not entirely known but is likely at depressed levels in some areas.

7. Bull trout mature at a relatively old age (six to seven years of age) and are vulnerable to overharvest by angling.

8. Bull trout are vulnerable to hybridization with brook trout where they co-exist.

9. Monitoring the distribution and abundance of mountain whitefish, redband trout, bull trout, and brook trout populations will provide an indication of their health and adaptiveness.

10. Lack of suitable trout habitat resulting from past and present land and water use management practices limits the ability of the Lower Grande Ronde River system to provide optimal spawning and rearing habitat.

Actions

Action 1.1 Monitor trends in redband trout, brook trout, bull trout, and mountain whitefish distribution and abundance in selected index reaches and verify and document their year around distribution.

Action 1.2 Assess the status of sensitive redband trout and bull trout in the Lower Grande Ronde River. Determine and prioritize future work on limiting factors for such items as instream habitat, harvest, and interactions with introduced species i.e., brook trout.

Action 1.3 Develop and implement a cooperative enforcement and information and education program with OSP to ensure compliance with angling regulations to protect sensitive, threatened, and endangered fish species.

Action 1.4 Establish base-line data on genetic and phenotypic characteristics of redband and bull trout with the use of biochemical and meristic parameters.

Action 1.5 Work with USFS, private forest owners, interested Indian Tribes, and other appropriate land management agencies in the development of a bull trout recovery plan in appropriate streams of the Grande Ronde River system. Determine and prioritize future work on limiting factors for such items as instream habitat, harvest, and interactions with introduced species i.e., brook trout.

Action 1.6 Determine impacts of residual hatchery steelhead on wild trout populations and modify hatchery programs if necessary to maintain Wild Fish Management Policy compliance.

Objective 2. Provide a fishery for naturally produced and hatchery supplemented redband trout and naturally produced bull trout, brook trout, and mountain whitefish.

Assumptions and Rationale

1. Management under this alternative seeks to provide a diversity of angling opportunities including both non-consumptive and consumptive use of wild trout.

2. Special regulations may be necessary to protect stock fitness, life history characteristics, and general health of trout populations.

3. Mountain whitefish populations are adequate to support an increased sport fishery.

4. Many people are not aware of the sport and food fish qualities of mountain whitefish.

5. Wild redband trout are distributed through out the Lower Grande Ronde River.

6. Current bull trout distribution and abundance is not entirely known but is likely at depressed levels in some areas.

7. Trout fisheries currently provide an acceptable fishery given the current level of angler use and abundance of trout.

Actions

Action 2.1 Release up to 10,000 fin-clipped legal-size hatchery rainbow trout annually in the Mainstem Wallowa River from RM 10 to 18.5 during summer high use period.

Action 2.2 Monitor angling pressure and harvest of hatchery and naturally produced trout through periodic creel surveys.

Action 2.3 Adjust stocking levels to maintain a return to the angler of at least 40% from hatchery rainbow trout released.

Action 2.4 Implement a cooperative enforcement and information and education program with OSP to insure compliance with regulations.

Action 2.5 Develop an information and education program to enhance angler awareness of sensitive species such as bull trout and redband trout where unique populations occur.

Action 2.6 Post signs at popular sites informing anglers on how to identify and correctly release wild rainbow and bull trout.

Action 2.7 Minimize the harvest impact of trout fisheries on wild juvenile summer steelhead.

Action 2.8 Implement catch and release for non-fin clipped redband trout through the Lower Wallowa River (RM 0 to 18.5).

Action 2.9 Evaluate the need for special closures to protect sensitive, threatened, and endangered species such as redband and bull trout and spring chinook salmon.

Action 2.10 Minimize wild summer steelhead smolt and pre-smolt harvest while allowing harvest of hatchery and wild trout. Encourage harvest of residual hatchery summer steelhead.

Action 2.11 Encourage utilization of the mountain whitefish resource in the basin.

Wallowa Lake

Alternative 1

Policies

Policy 1. **Redband trout shall be managed for natural production consistent with the Wild Fish Management Alternative for trout (ODFW 1987b). Hatchery rainbow trout shall not be stocked into Wallowa Lake.**

Policy 2. **Mountain whitefish and kokanee shall be managed for natural production consistent with the Basic Yield Management Alternative for trout (ODFW 1987b). Hatchery mountain whitefish, kokanee, and lake trout shall not be stocked into Wallowa Lake.**

Policy 3. **Lake trout shall be managed for natural production consistent with the Trophy Fish Management Alternative for trout (ODFW 1987b). No hatchery lake trout shall be stocked.**

Objective 1. **Maintain genetic diversity, adaptiveness, and abundance of wild redband trout, mountain whitefish, and kokanee in Wallowa Lake.**

Assumptions and Rationale

1. Indigenous rainbow trout from Wallowa Lake and Wallowa River above Wallowa Lake classified as inland redband trout have been identified as a sensitive species.

2. The population level of wild redband trout in Wallowa Lake is small and the production level is low.

3. Non-indigenous hatchery rainbow trout have been stocked into Wallowa Lake since 1938.

4. Non-indigenous hatchery kokanee have been stocked into Wallowa Lake since 1925.

5. Introduction of *Mysis* in 1965 resulted in changes in the trophic pattern of Wallowa Lake and may be affecting kokanee abundance, fitness, and age at maturity.

6. The indigenous redband trout and kokanee in Wallowa Lake utilize the Wallowa River above the lake as well as lake shorelines for spawning and early rearing.

7. Genetic monitoring will indicate if rainbow trout and kokanee in the Wallowa River and Lake are the progeny of indigenous fish or the result of natural spawning from previous hatchery releases.

8. Wallowa Lake supports a population of indigenous, mountain whitefish.

9. Population levels of mountain whitefish are unknown and few are harvested in the sport fishery.

10. Many people are not aware of the sport and food fish qualities of mountain whitefish.

11. Monitoring the abundance of wild redband trout, mountain whitefish, and kokanee in Wallowa Lake will provide an indication of the health and adaptiveness of these populations.

12. Lake trout were introduced in Wallowa Lake between 1920 and 1961 and have been naturally reproducing subsequently. Predation by lake trout on redband trout and kokanee does not appear to be significantly effecting redband trout, kokanee, and mountain whitefish abundance.

13. Genetic interaction between hatchery rainbow trout and kokanee and wild redband trout and kokanee may decrease the genetic fitness of wild populations if they interact during spawning.

Actions

Action 1.1 Discontinue stocking programs of hatchery rainbow trout and kokanee into Wallowa Lake.

Action 1.2 Develop base-line data on genetic characteristics of redband trout and kokanee in Wallowa Lake and the river above Wallowa Lake using biochemical (electrophoresis) and phenotypic parameters or other techniques. Compare Data on trout in Wallowa Lake with data from other areas in the Wallowa River subbasin.

Action 1.3 Monitor population trends of natural redband trout and kokanee in Wallowa Lake. Population trends will be determined by various methods including periodic creel surveys, spawning ground surveys, and netting.

Action 1.4 Develop methods to monitor abundance of redband trout and kokanee spawning adults in the Wallowa River.

Action 1.5 Determine the need for additional or modified angling regulations to protect populations of wild redband trout and kokanee by monitoring production, harvest, and catch rate.

Action 1.5 Continue periodic sampling to determine the relative abundance, density, and species composition of zooplankton in Wallowa Lake.

Action 1.6 Examine kokanee stomachs to determine if *Mysis* are an important component of kokanee diets;

Action 1.6 Determine relationships between kokanee abundance, size, and age at maturity and zooplankton species composition, density, and abundance.

Action 1.5 Assess length at age and maturity of kokanee from anglers' creels at Wallowa Lake;

Objective 2. Provide diverse angling opportunities for a consumptive fishery on naturally produced kokanee, redband trout, and mountain whitefish.

Assumptions and Rationale

1. Fisheries will be of a consumptive nature.

2. Populations of wild redband trout and kokanee may require special regulations to protect stock fitness and life history characteristics.

3. The management goal for kokanee and rainbow trout fisheries is to provide a catch rate of at least one fish per angler hour.

4. There is strong public interest in angling for rainbow trout and kokanee in Wallowa Lake.

5. Population levels of mountain whitefish are unknown and few are harvested in the sport fishery.

6. Many people are not aware of the sport and foodfish qualities of mountain whitefish.

Actions

Action 2.1 Evaluate angling pressure and harvest rates of redband trout, kokanee, and whitefish in Wallowa Lake annually from May through August through periodic creel surveys.

Action 2.2 Implement a cooperative enforcement and information and education program with OSP to insure compliance with regulations.

Action 2.3 Encourage utilization of the mountain whitefish resource in the basin.

Objective 3. Provide a trophy fishery for naturally produced lake trout as measured by the proportion of fish examined in the creel over 24 inches.

Assumptions and Rationale

1. Wallowa Lake historically has produced large, trophy size lake trout.

2. There is a strong public interest in angling for these large, trophy size lake trout.

3. Sexual maturity is usually attained at six or seven years of age and at approximately 20 inches in length in other lake trout populations.

4. Special regulations (catch limits and size restrictions) may be necessary to achieve this objective.

5. Restricting harvest to fish greater than 24 inches should allow Lake trout to spawn at least twice prior to harvest.

Actions

Action 3.1 Monitor abundance, size, and age composition of Lake trout by conducting periodic statistical creel surveys.

Action 3.2 Develop methods to inventory lake trout abundance.

Action 3.3 Determine size and age at maturity for lake trout to aid in determining angling regulations necessary to provide adequate spawning escapement and to provide a trophy (greater than 24 inches) fishery.

Alternative 2

Policies

Policy 1. **Redband trout and kokanee shall be managed for natural and hatchery production consistent with the Basic Yield Management Alternative for trout (ODFW, 1987b).**

Policy 2. **Mountain whitefish shall be managed for natural production consistent with the Basic Yield Management Alternative for trout (ODFW 1987b). No Hatchery mountain whitefish shall be stocked.**

Policy 3. **Lake trout shall be managed for natural production consistent with the Trophy Fish Management Alternative for trout (ODFW 1987b).**

Objective 1. **Maintain genetic diversity, adaptiveness, and abundance of wild redband trout, mountain whitefish, and kokanee in Wallowa Lake.**

Assumptions and Rationale

1. Indigenous rainbow trout from Wallowa Lake and Wallowa River above Wallowa Lake are classified as inland redband trout and have been identified as a sensitive species.

2. The population level of wild redband trout in Wallowa Lake is small and the production level is low.

3. Non-indigenous hatchery rainbow trout have been stocked into Wallowa Lake since 1938.

4. Non-indigenous hatchery kokanee have been stocked into Wallowa Lake since 1925.

5. Introduction of *Mysis* in 1965 resulted in changes in the trophic pattern of Wallowa Lake and may affect kokanee abundance, fitness, and age at maturity.

6. Redband trout and kokanee in Wallowa Lake utilize the Wallowa River above the lake for spawning and rearing.

7. Use of genetic monitoring will indicate if naturalized redband trout and kokanee in the Wallowa River and Wallowa Lake are the progeny of indigenous fish or the result of natural spawning from previous hatchery releases.

8. Wallowa Lake supports a population of indigenous mountain whitefish.

9. Population levels of mountain whitefish are unknown and few are harvested in the sport fishery.

10. Many people are not aware of the excellent sport and food fish qualities of mountain whitefish.

11. Monitoring the abundance of wild redband trout, mountain whitefish, and kokanee in Wallowa Lake will provide an indication of their health and adaptiveness.

12. Lake trout were stocked in Wallowa Lake between 1920 and 1961 and have been naturally reproducing subsequently. Predation by lake trout on redband trout and kokanee is not significantly effecting redband trout, kokanee, and mountain whitefish abundance.

13. Genetic interaction between hatchery rainbow trout and kokanee ,and wild redband trout and kokanee may decrease the genetic fitness of wild populations if they interact during spawning.

Actions

Action 1.1 Develop base-line data on genetic characteristics of redband trout and kokanee in Wallowa Lake and the River above Wallowa lake using biochemical (electrophoresis) and phenotypic parameters or other techniques. Compare data on trout in Wallowa Lake with data from other areas in the Wallowa River subbasin.

Action 1.2 Monitor population trends of redband trout and kokanee. Population trends will be determined through periodic creel surveys spawning ground surveys and netting.

Action 1.3 Develop methods to monitor abundance of redband trout and kokanee spawning adults in the Wallowa River.

Action 1.4 Determine the need for additional or modified angling regulations to protect populations of wild redband trout and kokanee by monitoring the production, harvest, and catch rate of wild trout.

Action 1.5 Continue periodic sampling to determine the relative abundance, density and species composition of zooplankton in Wallowa Lake.

Action 1.6 Determine the relationships between kokanee abundance, size, and age of maturity and zooplankton species composition, density, and abundance.

Objective 2. Provide diverse angling opportunities for a consumptive fishery on natural and hatchery produced kokanee and redband trout and naturally produced mountain whitefish.

Assumptions and Rationale

1. Fisheries will be of a consumptive nature.

2. Populations of redband trout and kokanee may require special regulations to protect stock fitness and life history characteristics.

3. The management goal for kokanee and redband trout fisheries is to provide a catch rate of at least one fish per angler hour.

4. There is strong public interest in angling for redband trout and kokanee in Wallowa Lake.

5. Population levels of mountain whitefish are unknown and few are harvested in the sport fishery.

6. Many people are not aware of the excellent sport and food fish qualities of mountain whitefish.

7. The current hatchery redband trout program uses Cape Cod domestic stock.

8. The current hatchery kokanee program uses non-indigenous stock from Paulina Lake.

Actions

Action 2.1 Annually stock up to 20,000 marked hatchery fingerling kokanee at 70 fish per pound during late July to early August and monitor their contribution to the fishery.

Action 2.2 Annually stock up to 50,000 legal-size hatchery rainbow trout at three fish per pound from June through September.

Action 2.3 Investigate the feasibility and desirability of utilizing native broodstock for the kokanee hatchery program.

Action 2.4 Evaluate the effectiveness of hatchery rainbow trout and kokanee stocking by conducting periodic creel surveys.

Action 2.5 Monitor abundance, size, and age-class structure of redband trout, kokanee, and mountain whitefish in the fishery in Wallowa Lake by conducting periodic creel surveys.

Action 2.6 Implement a cooperative enforcement and information and education program with OSP to insure compliance with regulations.

Action 2.7 Encourage utilization of the mountain whitefish resource in the basin.

Objective 3. Provide a trophy fishery for naturally produced lake trout as measured by the proportion of fish examined in the creel over 24 inches.

Assumptions and Rationale

1. Wallowa Lake historically has produced large, trophy size lake trout.

2. There is a strong public interest in angling for these large, trophy size lake trout.

3. Sexual maturity is usually attained at six or seven years of age and at approximately 20 inches in length in other lake trout populations.

4. Providing adequate spawning escapement through angling regulations is more practical than attempting to supplement natural production through hatchery releases.

5. Special regulations (catch limits and size restrictions) may be necessary to achieve this objective.

6. Restricting harvest to fish greater than 24 inches should allow lake trout to spawn at least twice prior to harvest.

Actions

Action 3.1 Monitor abundance, size, and age composition of lake trout by conducting periodic statistical creel surveys.

Action 3.2 Develop methods to inventory lake trout abundance.

Action 3.3 Determine size and age at maturity for lake trout to aid in determining angling regulations necessary to provide adequate spawning escapement and to provide a trophy (greater than 24 inches) fishery.

High Lakes

These waters are located primarily at higher elevations in the Wallowa mountains. Most are accessible only by trail and are periodically (aerial) stocked with brook and redband trout.

Stocking rates and species released are based on angling pressure, natural spawning, and productivity. This data is obtained from periodic high lake surveys and may change as angler effort and lake conditions change. Lakes that cannot support a viable fish population (those that freeze solid during the winter months or get too warm in the summer months) are not stocked. However, some opportunities may exist to modify the habitat in a few of these lakes, particularly those not in wilderness areas, to make them capable of rearing fish.

High lakes include all lakes on National Forest lands designated wilderness, and those with unimproved roads and facilities. Most of the lakes in this category are found in areas managed for low impact by the USFS i.e., the Eagle Cap Wilderness area. Since early stocking records were not well documented, for the purposes of this plan it is assumed that all of these lakes were barren until stocked by early settlers, thus a wild fish only alternative is not required. Some are important with respect to compliance with the Wild Fish Management Policy because they form part of the headwaters of major tributaries making up the Grande Ronde River system. Table 4 summarizes specific information for each primitive lake addressed in this plan.

Table 4. Lake specific information for Wallowa Mountain High lakes addressed in the Grande Ronde River basin Fish Management Plan.

Lake	Map Location	Surface Vol. in Acres	Acre ft.	Max Depth (feet)	Elevation (feet)	Species Previously Stocked	Species Currently Stocked	Species Currently Present	Management Alternative	Direct Outlet to River
Aneroid	T4S R45E S21	29.0	940	52	7,500	Eastern Brook Rainbow trout	Rainbow trout	Eastern Brook Rainbow trout	Basic Yield Basic Yield	Yes
Bear	T3S R43E S21	7	71	20	7,880	Eastern Brook		Eastern Brook	Basic Yield	
Billy Jones	T3S R44E S32	5.8	167	66	8,400	Rainbow trout		Eastern Brook	Basic Yield	
Blue	T4S R43E S31	31	857	62	7,600	Eastern Brook		Eastern Brook	Basic Yield	
Catched Two	T4S R43E S02	14	503	61	8,000	Eastern Brook		Eastern Brook	Basic Yield	
Cheval	T4S R43E S21	10	236	38	7,800	Eastern Brook		Eastern Brook	Basic Yield	
Chimney	T3S R43E S22	19	449	59	7,600	Eastern Brook		Eastern Brook	Basic Yield	
Craig	T4S R44E S22	1	--	5	7,400	Eastern Brook		Eastern Brook	Basic Yield	
Crescent	T6S R44E S22	23.8	200	21	7,440	Eastern Brook		Eastern Brook	Basic Yield	
Diamond	T5S R43E SO8	11.4	139	24	7,070	Eastern Brook		Eastern Brook	Basic Yield	
Dollar	T4S R45E S29	1.6	7	23	8,450	Eastern Brook Cutthroat Trout		Eastern Brook	Basic Yield	
Douglas	T4S R44E S25	43.98	1,353	80	7,350	Eastern Brook		Eastern Brook	Basic Yield	
Echo (Hurricane)	T5S R43E S21	6.8	137	47	8,320	Rainbow trout Eastern Brook Cutthroat Trout		Eastern Brook	Basic Yield	

Table 4. Continued

Lake	Map Location	Surface Vol. in Acres	Acre ft.	Max Depth (feet)	Elevation (feet)	Species Previously Stocked	Species Currently Stocked	Species Currently Present	Management Alternative	Direct Outlet to River
Frances	T3S R44E S18	30	181	21	7,600	Rainbow trout Eastern Brook Cutthroat Trout	Cutthroat Trout	Rainbow trout Eastern Brook Cutthroat Trout	Basic Yield BT featured spp. CT	
Frazier	T5S R45E S06	7.3	16	5	7,150	Eastern Brook Rainbow trout		Eastern Brook	Basic Yield	
Glacier	T5S R44E S01	40.9	2,184	124	8,200	Eastern Brook Rainbow trout	Rainbow trout	Eastern Brook Rainbow trout	Basic Yield	
Green	T3S R43E S31	24	461	28	7,000	Eastern Brook		Eastern Brook	Basic Yield	
Hawk	T4S R44E S09	3	24	18	8,000	Rainbow trout	Rainbow trout	Rainbow trout	Basic Yield	
Hazel	T4S R43E S05	6	--	--	7,760	Eastern Brook		Eastern Brook	Basic Yield	
Hobo	T3S R43E S21	8	107	34	7,800	Rainbow trout Golden Trout	Rainbow Trout	Rainbow trout	Basic Yield	
Horseshoe	T4S R44E S23	39.6	1,122	73	7,180	Eastern Brook		Eastern Brook	Basic Yield	
Ice	T4S R44E S12	46.1	2,681	193	7,900	Eastern Brook		Eastern Brook	Basic Yield	
John Henry	T3S R43E S28	16	56	13	7,200	Eastern Brook		Eastern Brook	Basic Yield	
Laverty (lower)	T3S R43E S22	4	12	12	--	Eastern Brook		Eastern Brook	Basic Yield	
Lee	T4S R44E S24	9.2	368	80	7,200	Eastern Brook		Eastern Brook	Basic Yield	
Legore	T3S R44E S08	2.2	17	30	8,880	Eastern Brook	Eastern Brook	Rainbow trout	Basic Yield	

Table 4. Continued

Lake	Map Location	Surface Acres	Vol. in Acre ft.	Max Depth (feet)	Elevation (feet)	Species Previously Stocked	Species Currently Stocked	Species Currently Present	Management Alternative	Direct Outlet to River
Lilly	T4S R44E S23	2.0	--	60	7,300	Eastern Brook			Basic Yield	
Long	T4S R43E S09	25	897	93	7,200	Eastern Brook		Eastern Brook	Basic Yield	
Maxwell	T3S R43E S35	17	315	50	7,800	Eastern Brook		Eastern Brook	Basic Yield	
Minam	T4S R44E S30	33	316	29	7,400	Eastern Brook Rainbow trout		Eastern Brook	Basic Yield	
Mirror	T4S R44E S27	26.2	793	77	7,590	Eastern Brook Rainbow trout		Eastern Brook Rainbow trout	Basic Yield	
Moccasin	T4S R44E S34	33.4	1,012	82	7,510	Eastern Brook		Eastern Brook	Basic Yield	
Pocket	T4S R44E S35	8.9	234	58	8,240	Eastern Brook		Eastern Brook	Basic Yield	
Pop	T5S R44E S18	5	--	26	--	Eastern Brook		Eastern Brook		
Prospect	T5S R44E S02	14	628	103	8,600	Rainbow trout Golden Trout	Rainbow trout	Rainbow trout	Basic Yield	
Rogers	T4S R45E S21	4.7	8	4	7,360	Eastern Brook Lake Trout		Eastern Brook	Basic Yield	
Steamboat	T4S R43E S10	30	1,341	101	7,400	Eastern Brook		Eastern Brook	Basic Yield	
Sunshine	T4S R44E S27	2.0	--	15	7,600	Eastern Brook Golden Trout		Eastern Brook	Basic Yield	
Swamp	T4S R43E S15	43	311	23	7,800	Rainbow trout Golden Trout	Rainbow Trout	Rainbow trout	Basic Yield	

Table 4. Continued

Lake	Map Location	Surface Vol. in Acres	Acre ft.	Max Depth (feet)	Elevation (feet)	Species Previously Stocked	Species Currently Stocked	Species Currently Present	Management Alternative	Direct Outlet to River
Razz	T4S R44E S14	13.5	213	24	8,470	Eastern Brook Golden Trout		Eastern Brook	Basic Yield	
Tombstone	T5S R43E S17	16.2	60	14	7,400	Eastern Brook		Eastern Brook	Basic Yield	
Unit	T4S R44E S24	14.9	256	31	7,040	Eastern Brook Rainbow trout	Rainbow trout	Eastern Brook Rainbow trout	Basic Yield	
Wild Sheep	T4S R44E S31	6	6	6	7,600	Eastern Brook		Eastern Brook	Basic Yield	
Wood	T3S R43E S15	135	24	24	7,400	Eastern Brook Golden Trout		Eastern Brook	Basic Yield	

Policies

Policy 1. **High lakes shall be managed for natural and hatchery production consistent with the basic yield management alternative for trout (ODFW, 1987b).**

Policy 2. **Hatchery rainbow, brook, golden, and cutthroat trout shall be periodically released into some high lakes listed in Table 4.**

Objectives

Objective 1. **Provide diverse angling opportunities for trout in high lakes of the Grande Ronde River basin.**

Assumptions and Rationale

1. Since suitable spawning habitat is lacking in some of these lakes, periodic stocking with hatchery trout is required.

2. Some of these high lakes are aerial stocked regularly with brook and rainbow trout (Table 4).

3. There is a high level of public interest in golden trout in the high lakes.

Actions

Action 1.1 Stock the high lakes with the species listed in Table 4.

Action 1.2 Periodically inventory all high lakes for size, abundance, growth, condition factor, and species composition of trout present.

Action 1.3 Periodically monitor angler effort, catch, and harvest in high lakes of the Grande Ronde River basin.

Action 1.4 Tailor the high lakes stocking program to meet the needs of the fisheries of the individual lakes.

Action 1.5 Work with WDF to ensure a continuing supply of Twin Lakes westslope cutthroat trout eggs and stock selected lakes as needed.

Action 1.6 Locate a source of golden trout for stocking in selected high lakes to satisfy public demand.

Objective 2. Maximize the harvest of brook trout from high lakes.

Assumptions and Rationale

1. Stocking and angling regulations are the primary method of managing fisheries in high lakes.

2. Where high lakes have indigenous trout in inlet or outlet streams, increased harvest of hatchery trout would minimize the opportunity for hatchery trout to impact wild trout populations.

3. A number of high lakes contain populations of stunted brook trout.

Actions

Action 2.1 Determine how harvest rates can be increased by modifying stocking frequency and numbers released.

Action 2.2 Develop a fishing brochure explaining the potential angling opportunities to be found in the high lakes of the Grande Ronde River basin.

Action 2.3 Encourage increased utilization of high lakes which contain populations of stunted brook trout.

Objective 3. Minimize impacts of hatchery trout in high lakes on production and genetic integrity of native trout in the Grande Ronde River basin.

Assumptions and Rationale

1. Some lakes in the high lakes category have outlets that drain into headwater streams of the Grande Ronde River basin. There may be indigenous wild trout populations in these streams that may be impacted by presence of hatchery trout that have escaped high lakes.

2. Current hatchery rainbow trout stocks spawn in the fall and are thought to contribute little to redband trout production in areas outside of where they are released.

Actions

Action 3.1 Electrofish the tributaries below the high lakes that drain into the Grande Ronde River system to determine if wild trout populations are present, and if hatchery trout stocked in the lakes are impacting downstream indigenous populations. Distinguishing indigenous and hatchery populations of the same species of trout in outlet streams may require measuring morphometric and electrophoretic parameters, or marking of all hatchery fish.

Action 3.2 Continue to use a hatchery stock which demonstrates a minimum of migratory behavior.

Action 3.3 In lakes where hatchery rainbow trout are used, continue to release a fall spawning variety. Continue releases unless it is estimated that they are contributing more than 10% to natural production in the streams below the lakes.

Action 3.4 Do not stock brook trout in lakes which have outlets into drainages that contain bull trout.

Small Ponds and Other High Intensity Waterbodies

This group of standing waters includes reservoirs, man made or natural small ponds, and other waterbodies with public access in the Grande Ronde River basin that are stocked with legal-size rainbow trout, warmwater fish, and surplus adult hatchery steelhead on a periodic basis (Table 5).

Table 5. Lakes and ponds in the Grande Ronde River basin that are periodically stocked by the Oregon Department of Fish and Wildlife.

Waterbody	Owner	Size in Acres	Salmonid Species	Approximate # of Fish Released
Grande Ronde Lake	USFS	10.6	Rb	5,000 Legals
Honeymoon Lake	USFS		Rb	500 Legal
Jubilee Reservoir	USFS	90.0	Rb	16,000 Fingerling
Kinney Lake	Wallowa Valley Impoundment Dist.	15.0	Rb	4,000 Legal 5,000 fingerling
Marr Pond	ODFW	1.0	Rb	2.500 Legal
Morgan Lake	City of La Grande	64.5	Rb BT	25,000 Fingerling 5,000 Fingerling
R-D Mac Ponds	Private	2.0	Rb	2,000 Legal
Roulette Pond	ODFW	0.5	Rb	3,000 Legal
Salt Creek	USFS	1.0	Rb	500 Legal
Victor Pond	Private	1.0	Rb	2,500 Legal
Vogel Pond	Private	0.5	Rb	500 Legal
Wallowa Wildlife Pond	ODOT	2.0	Rb	3500 Legal

These ponds and other waterbodies are located on the valley floor or on National Forest Lands with good road access. None of these waterbodies contained indigenous trout thus these areas are not affected by the Wild Fish Management Policy. However, all these

ponds and other waterbodies need to be inspected to insure that they do not drain into or are fed by streams that have a unique population of indigenous fish that could be impacted by warmwater or non-native trout released into the pond. Morphological or electrophoretic characteristics or both would have to be used to determine whether or not a wild population exists. If a wild stock is found, and the waterbody is found not to be in compliance, then stocking rates would have to be brought into compliance with the Wild Fish Management Policy, or barriers could be built to protect wild populations in these streams from the hatchery fish in the lakes and ponds.

Typically, legal-size rainbow trout are stocked into these ponds in the spring and early summer (April through July) for a short duration, intensive use fishery. They are all accessible by vehicle and receive extensive angling pressure. Many contain both warmwater and coldwater fish species. Some waters are stocked with legal-sized trout, and others with surplus fingerlings.

Policies

Policy 1. **Lakes, ponds, and other waterbodies in the Grande Ronde River basin shall be managed for hatchery production consistent with the Intensive Use Alternative for trout (ODFW 1987b).**

Policy 2. **Lakes, ponds, and other waterbodies in the Grande Ronde River basin shall be managed for warmwater fish consistent with the Basic Yield Management Alternative for warmwater fish (ODFW 1987a).**

Policy 3. **Legal-sized rainbow trout, warmwater fish, and surplus adult hatchery steelhead shall be stocked on a periodic basis in the following waterbodies listed in Table 5.**

Objectives

Objective 1. **Provide additional angler opportunity and recreation for a consumptive fishery by stocking legal-sized and fingerling rainbow trout, warmwater fish, and surplus adult hatchery steelhead periodically in the ponds and lakes in the Grande Ronde River basin listed in Table 5. which lists the approximate numbers periodically stocked in each waterbody.**

Assumptions and Rationale

1. The consumptive demand for trout and warmwater fish is greater than lakes of the Grande Ronde River basin can provide.

2. Additional angling opportunities can be provided through periodic releases of legal-sized rainbow trout and warmwater fish into waterbodies that may not support trout throughout the year.

3. Free fishing day has become a popular event. Free fishing day is a great opportunity for the state to introduce youngsters to fishing and start to educate them about the fisheries issues present in the Grande Ronde River basin.

Actions

Action 1.1 Periodically evaluate angling pressure and harvest rates of trout and warmwater fish at small ponds and lakes listed in Table 5 so that stocking practices may be modified to better meet angler demand and utilization.

Action 1.2 Determine appropriate stocking frequency and time of year to stock legal-sized rainbow trout to maximize harvest.

Action 1.3 Develop an angling brochure for the public ponds and lakes of the Grande Ronde River basin.

Objective 2. Minimize impacts of hatchery trout and warmwater fish released into small ponds and high intensity use waterbodies on native trout in the Grande Ronde River basin.

Assumptions and Rationale

1. Some ponds and high use lakes have outlets that drain into headwater streams of the Grande Ronde River basin. There may be indigenous wild trout populations in these streams that may be impacted by presence of hatchery trout that have escaped these waterbodies.

2. Current hatchery rainbow trout stocks spawn in the fall and are thought to contribute little to redband trout production in areas outside of where they are released.

Actions

Action 2.1 Survey the tributaries below small ponds and high use lakes that drain into the Grande Ronde River system to determine if wild trout populations are present, and if hatchery trout stocked in the lakes are impacting downstream indigenous populations. Distinguishing indigenous and hatchery populations of the same species of trout in outlet streams may require measuring morphometric and electrophoretic parameters, or marking of all hatchery fish.

Action 2.2 Continue to use a hatchery stock which demonstrates a minimum of migratory behavior.

Action 2.3 In lakes where hatchery rainbow trout are used, continue to release a fall spawning variety. Continue releases unless it is estimated that they are contributing more than 10% to natural production in the streams below the lakes.

Action 2.4 Do not stock brook trout in lakes which have outlets into drainages that contain bull trout.

APPENDIX A

Appendix A Table 1. Kokanee releases in Wallowa Lake from 1926 to 1991. Stock or hatchery of origin is unknown unless otherwise stated.

Year	Stock of Origin	Number	Total Weight	Size
1925		300,000		Fingerling
1938		1,528,000		Fingerling
1939		64,000		Fingerling
1940		344,733		Fingerling
1941		9		Legal
1942		294,518		Fingerling
1947		180,800	57	Fingerling
1948		219,200	69	Fingerling
1950		341,200	110	Fingerling
1953		19,750		Fingerling
1954		128,340	30	Fingerling
1955		135,000	68	Fingerling
1956		92,920		Fingerling
1957		664,778		Fingerling
1958		906,900	200	Fingerling
1960		520,000	130	Fingerling
1961		13,260	40	Fingerling
1962		101,206	532	Fingerling
1963		203,593	1,129	Fingerling
1964		209,657	1,239	Fingerling
1965		256,243	1,759	Fingerling
1966		201,940	1,299	Fingerling
1967		102,869	873	Fingerling
1968		49,968	272	Fingerling
1969		50,600	595	Fingerling
1970		50,215	797	Fingerling
1981		31,978	271	Fingerling
1982		29,950	375	Fingerling
1990		10,092	174	Fingerling
1991		10,112	158	Fingerling
1992				

Appendix A Table 2. A comparison of angling effort and harvest, kokanee stratum (May - June) for Wallowa Lake, 1979-1992. Stock or hatchery of origin is unknown unless otherwise stated.

Year	Angler Hours	Rainbow Trout	Kokanee	Lake Trout	Bull Trout	Mountain Whitefish
1979	22,939	6,016	27,907	0	99	0
1980	18,505	5,542	18,942	26	0	38
1981	8,978	2,096	9,270	33	0	0
1982	23,618	6,519	30,623	0	0	54
1983	15,361	6,252	21,413	0	0	0
1984	30,303	11,315	31,331	21	0	0
1985	--	--	--	--	--	--
1986	22,920	5,544	24,856	18	0	18
1987	22,960	1,016	21,687	0	0	16
1988	18,922	5,989	14,495	13	0	75
1989	25,466	6,211	17,277	7	0	0
1990	18,646	6,494	10,742	30	0	0
1991	18,286	8,835	9,884	3	0	3
1992	24,419	7,276	25,072	9	0	0

Appendix A Table 3. Bull trout releases in the Grande Ronde River basin from 1964 to 1990. Stock or hatchery of origin is unknown unless otherwise stated.

Year	Stock of Origin	Number	Total Weight	Size
Wallowa Lake				
1968	Wallowa H.	1,897	22	Fingerling
1973	Wallowa H.	26	10	Legal
1974	Wallowa H.	19,500	130	Fingerling
1975	Wallowa H.	4,312	1,232	Legal
	Wallowa H.	3,009	255	Fingerling
1976	Wallowa H.	10, 080	70	Fingerling
	Wallowa H.	7,304		Legal
1977	Wallowa H.	13,300		Fingerling
	Wallowa H.	5,000		Legal
1978	Wallowa H.	6,560	800	Legal
Wallowa River				
1974	Wallowa H.	35,910	9	Fingerling
1978	Wallowa H.	11,520	160	Fingerling

Table 4. Eastern brook trout releases in the Grande Ronde River basin from 1925 to 1963. Stock or hatchery of origin is unknown unless otherwise stated.

Waterbody / Year	Stock of Origin	Number	Total Weight	Size
Aneroid Lake				
1945		5,360	16	Fingerling
Anthony Creek				
1926		20,000		
Beaver Creek				
1932		8,000		
Beaver Creek Reservoir				
1932		20,000		
Big Hurricane Creek				
1947	Wallowa H.	10,600	20	Fingerling
Catherine Creek				
1925		20,000		
1926		55,000		
1928		2,000		
1929		12,000		
1930		46,000		
1931		10,000		
Little Catherine Creek				
1926		10,000		
Crescent Lake				
1945		5,360	16	Fingerling
Cross Valley Canal				
1963	Fall River H.	4,000	22	Fingerling
1964	Fall River H.	6,018	36	Fingerling
Dobbin Creek				
1945	Wallowa H.	5,060	23	Fingerling
1947	Wallowa H.	15,900	30	Fingerling
1948	Wallowa H.	8,400	300	Fingerling
1963	Fall River H.	3,940	21	Fingerling
Douglas Lake				
1945		5,344	16	Fingerling

Table 4. Continued.

Waterbody Year	Stock of Origin	Number	Total Weight	Size
Dry Creek				
1932		16,600		
1934		6,000		
Five Points Creek				
1926		13,000		
1929		5,000		
Fly Creek				
1929		3,000		
Ford's Pond				
1964	Fall River H.	6,033	36	Fingerling
Frances Lake				
1950	Wallowa H.	7,100	20	Fingerling
1951	Wallowa H.	15,000	50	Fingerling
1959	Fall River H.	19,168	78	Fingerling
1962	Fall River H.	4,575	15	Fingerling
Frazier Lake				
1945		5,344	16	Fingerling
Grande Ronde Lake				
1949	Wallowa H.	2,000	400	Legal
1950	Wallowa H.	1,680	420	Legal
Grande Ronde River				
1925	Wallowa H.	10,000		
1930	Wallowa H.	20		
Hobo Lake				
1945		5,344	16	Fingerling
Hurricane Creek				
1964	Wallowa H.	2,899	17	Fingerling
1964	Fall River	3,014	18	Fingerling
1965	Wallowa H.	3,300	10	Fingerling
Ladd Creek				
1932		10,000		

Table 4. Continued.

Waterbody Year	Stock of Origin	Number	Total Weight	Size
Legore Lake				
1965	Wallowa H.	1,980	6	Fingerling
Lick Creek				
1931		2,000		
Little Creek				
1925		10,000		
Little Hurricane				
1947	Wallowa H.	10,600	20	Fingerling
Maxwell Lake				
1952	Wallowa H.	5,250	15	Fingerling
McDonald Creek				
1928		1,000		
Mill Creek				
1930		5,000		
Minam Lake				
1945		8,375	25	Fingerling
Minam River				
1945		5,344	15	Fingerling
1947	Wallowa H.	11,650	25	Fingerling
1948	Wallowa H.	9,840	60	Fingerling
Mirror Lake				
1945		4,355	13	Fingerling
Mocassin Lake				
1945		4,355	13	Fingerling
Morgan Lake				
1961	Fall River H.	30,800	154	Fingerling
1962	Oak Springs H.	14,980	250	Fingerling
1965	Fall River H.	50,000	500	Legal
1969	Fall River H.	5,000	17	Fingerling
1971	Fall River H.	5,050	50	Fingerling

Table 4. Continued.

Waterbody Year	Stock of Origin	Number	Total Weight	Size
1976	Fall River H.	5,030	63	Fingerling
1977	Fall River H.	5,088	53	Fingerling
1982	Fall River H.	5,005	70	Fingerling
1988	Wallowa H.	5,040	63	Fingerling
1990	Wallowa H.	5,000	25	Fingerling
Parsnip Creek				
1963	Fall River H.	1,850	10	Fingerling
Prairie Creek				
1945	Wallowa H.	8,800	40	Fingerling
1947	Wallowa H.	10,690	20	Fingerling
1963	Fall River H.	5,670	31	Fingerling
1964	Fall River H.	6,028	36	Fingerling
1990	Fall River H.	3,026	34	Fingerling
Prospect Lake				
1929		1,000		
Rainbow Ponds				
1988		1,229	10	Fingerling
Rogers Lake				
1945		5,360	16	Fingerling
Sanderson Springs				
1931		8,000		
1932		12,000		
1934		12,000		
1947	Wallowa H.	10,000	20	Fingerling
1949	Wallowa H.	1,800	360	Legal
1950	Wallowa H.	1,000	200	Legal
Tombstone				
1925		1,000		
Unit Lake				
1945		5,360	16	Fingerling
Wallowa Hatchery Pond				
1977	Wallowa H.	22,450	350	Fingerling

Table 4. Continued.

Waterbody Year	Stock of Origin	Number	Total Weight	Size
Wallowa Lake				
1938		100,000		Fingerling
1939		230,000		Fingerling
1940		299,992		Fingerling
1941		59,686		Fingerling
		139		Legal
1942		17,967		Fingerling
Wallowa River				
1947	Wallowa H.	15,900	30	Fingerling
1948	Wallowa H.	7,280	260	Fingerling
1949	Wallowa H.	10,305	1,810	Legal
1950	Wallowa H.	1,948	462	Legal
1963	Wallowa H.	2,070	22	Fingerling
1964	Fall River H.	24,122	144	Fingerling
1964	Wallowa H.	2,016	12	Fingerling
Wallowa River, Upper West Fork				
1950	Wallowa H.	1,500	300	Legal
Weatherspoon Pond				
1928		1,600		
Willow Creek				
1928		9,000		
1932		12,000		
1934		6,000		

Table 5. Lake Trout releases in Wallowa Lake from 1956 to 1961.

Year	Stock of Origin	Number	Total Weight	Size
1956	Wallowa H.	9,079		Fingerling
1957	Wallowa H.	2,424	165	Fingerling
1958	Wallowa H.	64,425	1,186	Fingerling
1959	Wallowa H.	65,788	1,300	Fingerling
1960	Wallowa H.	33,897	892	Fingerling
1961	Wallowa H.	32,620	680	Fingerling

Table 6. Golden trout releases in the Grande Ronde River basin from 1953 to 1958.

Waterbody Year	Stock of Origin	Number	Total Weight	Size
Baby Long Lake				
1953	Wallowa H.	1,000		Fingerling
Hobo Lake				
1953	Wallowa H.	2,000		Fingerling
1958	Wizard Falls H.	7,936	32	Fingerling
Hurricane Creek				
1953	Wallowa H.	2,500		Fingerling
1954	Wallowa H.	1,495		Fingerling
1958	Wizard Falls H.	645	30	Fingerling
Prospect Lake				
1954	Wallowa H.	3,000		Fingerling
Razz Lake				
1954	Wallowa H.	1,274		Fingerling
1957	Wallowa H.	8,100	3	Fingerling
1958	Wizard Falls H.	7,936	32	Fingerling
Swamp Lake				
1953	Wallowa H.	1,000		Fingerling
1954	Wallowa H.	2,000		Fingerling
1957	Wallowa H.	19,600	8	Fingerling
1958	Wizard Falls H.	7,936	32	Fingerling

Table 7. Cutthroat trout releases in the Grande Ronde River basin from 1947 to 1990.

Waterbody Year	Stock of Origin	Number	Total Weight	Size
Dollar Lake				
1947	Wallowa H.	5,219	5	Fingerling
Echo Lake				
1961	Hood River H.	2,300	8	Fingerling
Frances Lake				
1948	Wallowa H.	8,244	18	Fingerling
1950	Wallowa H.	39,750	13	Fingerling
1952	Wallowa H.	27,000	7	Fingerling
1958	Wallowa H.	23,000	6	Fingerling
1959	Wizard Falls H.	21,050	43	Fingerling
1961	Hood River H.	7,990	26	Fingerling
1964	Wallowa H.	8,172	2	Fingerling
1990	Fall River H.	4,984	28	Fingerling
Hatchery Lake				
1948	Montana Cutt. (Wallowa H.)	4,075	25	Fingerling
Hawk Lake				
1950	Wallowa H.	21,700	7	Fingerling
1952	Wallowa H.	10,000	3	Fingerling
Hobo Lake				
1947	Wallowa H.	10,111	8	Fingerling
1948		5,002	12	Fingerling
Minam Lake				
1962	Mann Lake Cutt. (Wallowa H.)	7,744	2	Fingerling
Papoose Lake				
1947	Wallowa H.	2,149	2	Fingerling
Spring Creek (Wallowa County)				
1959	Wallowa H.	15		Fingerling
Wallowa Lake				
1938	Wallowa H.	50,000		Fingerling
1941	Wallowa H.	7,116		Fingerling
1942	Wallowa H.	1,081		Fingerling
1948	Wallowa H.	4,075	25	Fingerling
1958	Wallowa H.	8	20	Legal

WARMWATER FISH SPECIES

Background and Status

Origin

Populations historically and currently present: Warmwater fish species in the Grande Ronde River basin include; black crappie, white crappie, largemouth bass, smallmouth bass, bluegill, pumpkinseed, warmouth, yellow perch, channel catfish, flathead catfish, and brown bullhead, none of which are native to the Grande Ronde River System or to Oregon.

Life History and Population Characteristics

Natural production: Habitat protection will help maintain warmwater fish populations.

Distribution: This is a diverse group of fishes that generally prefer the slow moving or standing waters of rivers, streams, and sloughs, and water temperatures in the 60 degree to 80 degree F. range. Consequently, population numbers in the Grande Ronde River basin are lower than anadromous and resident salmonids, and their distribution is limited to suitable habitat found in the Grande Ronde River and associated sloughs between La Grande and Elgin, and Catherine Creek slough. Smallmouth bass are also found in the lower Grande Ronde River up to Bear Creek (RM. 67), lower Joseph Creek, and the lower Minam River.

Time and Location of Spawning: All of these fish species are spring or early summer spawners, although bluegill can spawn throughout the season.

Interspecific relationships: These species do not generally inhabit areas that hold salmonid fish species year round, but they do inhabit areas that provide seasonal passage or rearing habitat for salmonids. Interspecific relationships between the two groups are poorly understood, but there is no indication that warmwater species compete with, or consume salmonids to a significant extent in the Grande Ronde River System.

Trends in Abundance: None of these species are known to be at critically low levels of abundance. In fact, populations could support additional angling pressure. The abundance and distribution of smallmouth bass in the lower Grande Ronde River appears to be growing. A target fishery has developed for smallmouth bass in the portion of the river in Washington (lower 40 miles).

Hatchery production: Warmwater game fish are not routinely supplemented through stocking programs, however from 1961 to 1963 a total of 4,818 channel catfish of various sizes (2 to 21 inches) from Brownlee Reservoir were released into the sloughs of the mainstem Grande Ronde River near La Grande. There is no evidence of survival from these releases.

Angling and Harvest

Opportunities exist to harvest warmwater fish at certain times of the year, primarily in spring and early summer, and in the fall. Most of the areas that warmwater game fish inhabit are on private land, and landowners have the option of restricting access. Anglers in northeastern Oregon generally fish the reservoirs and standing waters for warmwater species, therefore the Grande Ronde River system receives little pressure. Currently smallmouth bass in the Oregon portion of the Grande Ronde River have not grown to a size or abundance to attract anglers. Additional angler days could be accommodated in the Grande Ronde River system.

Regulations: The general limits are: Largemouth and smallmouth bass, five bass per day, no more than three over 15 inches; bluegill, catfish, crappie, other sunfish, and yellow perch, no limits.

Management Considerations

Information Needs

1. Data on abundance, distribution, harvest, and specific life-history characteristics of warmwater fish species in the Grande Ronde River basin are lacking.

Policies

Policy 1. **Warmwater fish species in the Grande Ronde River basin shall be managed consistent with the Warmwater Game Fish Plan (Basic Yield Alternative) and the Natural Production Policy.**

Objectives

Objective 1. **Maintain a stable size distribution in self-sustaining populations of warmwater fish within their current distribution to provide fisheries at present or increased levels.**

Assumptions and Rationale

1. Population levels of warmwater fish species are unknown, but are limited to a small number of lakes, sloughs, and stream reaches in the Grande Ronde River basin.

2. Warmwater fish species are an integral part of the diversity of fishing opportunity for many anglers.

Actions

Action 1.1 Monitor recruitment, abundance, size, population structure, distribution, and growth rates of key warmwater fish populations.

Action 1.2 Implement a creel survey to collect basic information on catch rate and size composition of key warmwater fish populations.

Action 1.3 Increase angler opportunity by developing and improving angler access. Develop a "welcome to fish" program with co-operative private landowners in the Grande Ronde Valley.

Action 1.4 Contact local fishing clubs to obtain commitments to maintain (clean up) and develop additional angling access.

Action 1.5 Publicize recreational fishery information and encourage angling for these species.

Action 1.6 Identify opportunities to develop ponds that can be managed for public angling for warmwater fish species. Some opportunities may exist on ODFW wildlife management areas.

Action 1.7 Maintain statewide angling regulations unless modifications are necessary to maintain recruitment, abundance, or desired size composition of warmwater fish.

OTHER "FISH" SPECIES

Background and Status

The 19 species in this category are the Pacific lamprey (*Lampetra tridentada)*, western brook lamprey (*Lampetra richardsoni)*, mottled sculpin (*Cottus bairdi)*, slimy sculpin (*Cottus cognatus)*, torrent sculpin (*Cottus rhotheus)*, shorthead sculpin (*Cottus confusus)*, piaiute sculpin (*Cottus beldingi)*, carp (*Cyprinus carpio)*, northem squawfish (*Ptychocheilus oregonensis)*, chiselmouth (*Acrocheilus alutaceus)*, peamouth (*Mylocheilus caurinus)*, longnose dace (*Rhinichthys cataractae)*, redside shiner (*Richardsonius balteatus)*, speckled dace (*Rhihichthys osculus)*, largescale sucker (*Catostomus macrocheilus)*, mountain sucker (*Catostomus platyrhynchus)*, bridgelip sucker (*Catostomus columbianus)*, and two species of crayfish (*Pacifasticus gambeli)* and (*Pacifasticus leniusculus).*

The above species (except for carp) are native to the Grande Ronde River system. Little information is available on abundance, and their population numbers vary according to species.

Some of these species may possibly be competitors with salmonid species for food and space in the Grande Ronde River basin, but we know of no definitive studies to determine this. At this time we do not believe that competition or predation by any of these species is a limiting factor for salmonids in the Grande Ronde River basin. However, juvenile and adult stages of some of these species are food for economically important fishes such as fingerling and smolt salmonids.

Most populations are in ecological balance with the carrying capacity of their habitat. Most of these fishes are responsive to changes in habitat and generally are able to utilize available habitat. These fishes are probably affected by forest and other activities that change water quality. Splash damming probably had a major impact on the dace because this fish lives in fast water deep within the gravel structure.

LAMPREY

There are two species of lamprey historically occurring in the Grande Ronde River basin. The Pacific lamprey and western brook lamprey. The western brook lamprey is probably not present in the basin today and the Pacific lamprey may be extinct as well.

The once-abundant Pacific lamprey populations are severely depressed or absent in mid- and upper Columbia and Snake river tributaries. Depressed upriver Pacific lamprey runs have forced the Tribes to gather this traditional food fish in lower Columbia River locations and declining runs have impacted treaty secured fishing rights. Habitat protection may help

Natural production: The Pacific lamprey is parasitic to fish in the ocean phase of its lifecycle. The Pacific lamprey is a known predator of salmonids in the Pacific ocean, but the effect of mortality on salmonids from this predator cannot be separated from that of other marine predators. We also do not know what other fish it preys on, where it is distributed in the ocean, and the relative importance of salmonids and other fishes as food sources. The

Pacific lamprey lives at least seven years, weighing up to one pound, and attaining a length of 30 inches. Females of this species can produce up to 106,000 eggs (for a Pacific lamprey of 16 inches) with an average of 34,000 eggs. The ammocoetes (juvenile stage) spend five to six years buried in the substrate and after emergence they migrate downstream to the ocean. A small number of Pacific lamprey remain landlocked preying on freshwater fishes. This species of lamprey is very adept at navigating up, over, and around obstacles by utilizing the suctorial disk (Scott and Crossman 1973 and Wydoski and Whitney 1979).

The western brook lamprey is nonparasitic (adults do not feed). Compared to other lamprey species the teeth of the western Brook lamprey are nonfunctional. Adults may reach seven inches in length. This species is nonanadromous (spends its life in freshwater) and has a life span of up to six years. Spawning occurs within a temperature range of 46° to 68° F., and after the eggs hatch the ammocoetes dig into the silt at the edge of the water. When the adult emerges, usually after approximately five years, they over-winter, reproduce, and die. (Scott and Crossman 1973 and Wydoski and Whitney 1979).

Hatchery production: Lamprey are not supplemented through stocking programs. In the Grande Ronde River basin to date, little attention has been given to enhancement efforts for this species.

Angling and Harvest

Regulations: Sport harvest for lamprey is allowed as well as treaty commercial harvest. Non-treaty commercial harvest of lamprey is prohibited.

CRAYFISH

Natural Production

Crayfish are the most important freshwater invertebrate in Oregon's fisheries. They provide a small recreational fishery in the upper rivers and tributaries of the Grande Ronde River basin. They are also important fish forage in the basin.

Three species of crayfish are native to Oregon (Hobbs 1976) with two occurring in this basin. These species, their subspecies and intergrades are spread statewide, with overlapping distributions. Females mature at about 18-30 months. Fecundity increases with size and perhaps age. There is evidence to suggest that some or perhaps all females do not breed each year. Crayfish breed in the summer, with the first egg-bearing females appearing as early as September. Eggs are carried over the winter and hatch late April to late June.

Hatchery Production

There is no hatchery production of crayfish in the Grande Ronde River basin. No commercial crayfish culture operations have yet been successful in the state.

Angling and Harvest

Crayfish have been fished commercially in Oregon since before 1893 when records were first kept. Markets for bait and for restaurant food dictate the size of landings. There are no commercial landings in this basin.

Regulations: Recreational use of the resource is widespread for bait and direct consumption. No license is required to take crayfish. The daily bag limit is 100 per person. The season is open the entire year at all hours. Estimates of sport harvest levels in the Grande Ronde River basin are unavailable.

Management Concerns

Little interest has been shown in the above species in the past although with the current apparent decline in some species i.e., lamprey, more attention may be needed in the future. Water pollution, particularly pesticides and some industrial wastes, and flow depletions are the most serious threats to these populations. Local crayfish populations may also be subject to overharvest.

Major Problems and Issues

1. The inventory base for these species must be improved. Inventory information is important as an indicator of overall habitat conditions.

Information needs

1. Information is needed in regards to the historical distribution of these species in the Grande Ronde River basin.

2. Data on abundance, harvest, and specific life-history characteristics of these species in the Grande Ronde River basin are lacking.

3. Information on limiting factors of the above species in the Grande Ronde River basin is needed.

4. Life history and ecological information of the above species is lacking. Educational institutions and other research groups should be encouraged to study the life history and ecology of these species to better understand factors that limit populations and provide some basis for assessing their well-being.

Policies

Policy 1. These fish species shall be managed for natural production.

Objectives

Objective 1. Identify pacific lamprey enhancement opportunities and implement projects which will bring back populations in the Grande Ronde River basin.

Assumptions and Rationale

1. Population levels of lamprey are unknown, but are very limited in the Grande Ronde River basin.

2. Lamprey are an integral part of the diversity of fishing opportunity for the Tribes.

Actions

Action 1.1 Close the Grande Ronde River and tributaries to potential sport harvest of lamprey.

Action 1.2 Research historical distribution through literature and interviews.

Action 1.3 Conduct presence, absence, and abundance inventories.

Action 1.5 Monitor recruitment, abundance, size, population structure, distribution, and growth rates of all non-game fish populations.

Objective 2. Maintain healthy sustainable populations of the above species.

Assumptions and Rationale

1. Habitat protection efforts will help maintain adequate habitat for these species.

2. As far as we know, none of these species are at a critical level of abundance.

3. Although these species have limited direct value to fisheries, they need to be recognized for their importance as a food source for other fish and for being a natural part of the Grande Ronde River basin ecosystem, contributing to its complexity.

4 No unauthorized introductions of freshwater fishes will occur.

Actions

Action 2.1 Encourage educational institutions and other research groups to study the life histories, ecology, behavior, and other aspects of these species.

Action 2.2 Support and become involved in cooperative interagency research on the ecological communities these species occupy.

Action 2.3 Expand efforts to evaluate the factors affecting survival of these species.

Action 2.4 Inventory stocks of these species.

Objective 3. Determine the population status of all non-game fish.

Assumptions and Rationale

1. Information on the abundance of these fish is lacking.

2. Past habitat degradation may have expanded the distribution and increased densities of some of these species in the Grande Ronde River basin.

3. Habitat enhancement projects to improve general quality for other fish species may affect changes in some non-game fish populations.

Actions

Action 3.1 Conduct an inventory of the relative population abundance and determine habitat requirements of these fish.

Action 3.2 Determine limiting factors which have been or are currently impacting lamprey populations. Limiting factors analyses (including assessment of mainstem passage problems) will be conducted on representative populations to identify problems.

Objective 4. Assess the population status of crayfish in the Grande Ronde River basin.

Assumptions and Rationale

1. Catch information is not reported and should be collected for all waters.

Actions

Action 4.1 Conduct biological sampling in key areas to determine size and age composition and relative abundance of crayfish.

Objective 5. Determine the size and importance of the recreational crayfish harvest in the Grande Ronde River basin.

Assumptions and Rationale

1. Currently there is no measure of the impact of recreational harvest or fishery potential of crayfish.

2. There are no estimates of current harvest or effort.

3. Recreational harvest is widespread but is generally at low levels.

Actions

Action 2.1 Conduct creel studies in key areas to evaluate harvest and effort.

ANGLING LAW ENFORCEMENT

Background

Angling regulations are enforced by the Oregon State Police (OSP). Boating regulations are enforced by the OSP and Union and Wallowa County Sheriff. These regulations exist to protect fishery resources, to permit an orderly and equitable use of the resources, and to provide public safety.

Violations occur in the Grande Ronde River basin. Fishing without a license, fishing with illegal gear (i.e., barbed hooks), taking undersize fish, and exceeding the harvest limits are the most common violations. Poaching (e.g. night fishing or fishing in closed sections of the river), snagging, and gillnet fishing also occurs. Trout angling in streams prior to the opening of the season also occurs. Snagging and pitch forking of salmon is suspected to be a problem in some locations.

Although the OSP and the Union and Wallowa County Sheriff's Department are generally responsible for enforcement of angling and boating laws respectively, these agencies also work together. ODFW provides assistance in curtailing illegal harvest and promoting boating safety.

Policy 1. **Ensure continued protection for the fishery resource.**

Objectives

Objective 1. **Protect wild and federally listed fish populations and provide for an equitable harvest of surplus fish by reducing illegal harvest. This reduction will be achieved through coordinated efforts with Oregon State Police, Union and Wallowa County Sheriff Department, and ODFW.**

Assumptions and Rationale

1. Violations of sport fishing regulations occur in the Grande Ronde River basin.
2. Foul-hooking of spring chinook salmon may increase with the development of fisheries resulting from the release program at Lookingglass Hatchery.
3. Law enforcement staff levels are inadequate to effectively protect the fishery resource.

Actions

Action 1.1 Increase efforts to educate anglers (especially juveniles) and the general public on the reasons for and the benefits of angling regulations and the detriments of illegal harvesting. Encourage their help in apprehending violators i.e., calling "Turn In Poachers" (TIP) if they witness illegal activities.

Action 1.2 Work with sportsmen's groups to organize and to pressure the courts to deliver substantial penalties to violators, and encourage newspapers to publish the results.

Action 1.3 Encourage the legislature to provide funding for adequate law enforcement and staffing, with the addition of one full time cadet assigned to the Grande Ronde River basin.

Action 1.4 Investigate methods to increase law enforcement man-hours i.e., the possibility of utilizing sheriff deputies for wildlife law enforcement.

Action 1.5 Work with the OSP, Union and Wallowa County Sheriff, Oregon State Parks, and USFS to post signs highlighting Grande Ronde River fishing regulations and provide detailed angling regulation pamphlets at access sites.

Action 1.6 Increase angler checks for compliance with size, bag limit, and gear regulations.

Action 1.7 Work with the Oregon State Marine Board and Sheriff's Department to increase public education as to the reasons for and benefits of boating safety, and encourage reporting of violators.

APPENDIX C. STOCKING POLICY REVIEW PROCESS

The guidelines listed below are excerpted from the statewide trout management plan that was accepted by the Oregon Fish and Wildlife Commission in November of 1987. This guideline provides for an orderly program of introducing new species, races, or stocks of fish into Oregon waters and for transferring existing stocks within the state. The guide outlines procedures for (1) requesting authorization for introductions, (2) evaluating requests. and (3) upon acceptance, implementation of introductions into the management plans of ODFW.

The guide applies to state and federal agencies, private individuals, or groups desiring to plant fish into public and private waters of the state. ODFW is charged with controlling fish transfers within the state and administering the fish transport permit system.

Evaluation

All introductions of new species into public waters within the basin must be followed by an evaluation of their contribution to public fisheries. This evaluation will include examination of adverse effect on other species to determine if the introductions are dependent upon the findings of this evaluation. Evaluation plans must be included in the introduction proposal.

Annual Requests

All requests to release fish within public waters under ODFW rearing or transfer programs must be authorized by inclusion in the production-release schedule assembled annually by the Fish Culture Section. This schedule includes all salmon, steelhead, trout, warmwater, or other species to be released, by ODFW, in public waters. No other releases are authorized except to private ponds or facilities under fish transport or release permits.

Introductions by Private Parties

Fish transport permits are required of private hatcheries and individuals to transfer fish into Oregon and to transfer fish between locations within or through the state even though the fish are not to be released onto Oregon public waters at the time of transfer. A record of disease and virus inspection, certified by a pathologist acceptable to ODFW, must be submitted along with a request to import fish or eggs into Oregon. Transfers are not generally allowed if they will be the first introduction of a new species, stock, or fish disease to that system or area.

Introduction of a new species or stock requires an introduction proposal as outlined herein. The proposal may be required of the private party wishing to introduce the stock of fish or written in conjunction with the appropriate district management biologist of ODFW.

Introduction or Transfer of Fish Into Oregon Waters (Statewide General Guidelines)

A.

1. Any fish may be released into any public lake, stream, or estuary in which the species and stock is indigenous.

    a. Introductions into new public impoundments must be reviewed and included in an accepted management plan for that impoundment.

    b. All public hatchery or wild fish or adults from which eggs are taken for shipment must have a pathological examination prior to release of the fish or progeny into Oregon waters or transfer to or between hatcheries, except within the same stream system or to an isolation facility.

    c. No fish shall be released when there is evidence that such action will constitute the first exposure of the native stock to a disease.

    d. All fish imported into Oregon for release in public or private waters of Oregon must be inspected for disease as required by regulations then in effect.

2. Releases, public or private, upstream from public hatcheries must be coordinated with the appropriate fish agencies and ODFW personnel.

3. Fish release schedules will be coordinated to minimize competition with resident trout, juvenile steelhead, juvenile salmon, or other hatchery stocks.

4. Common hatchery stocks of trout and kokanee may be used statewide in accordance with annual Fish Culture Section production scheduling and review, but they are subject to appropriate disease clearance prior to transfer.

5. Hatchery-developed stocks will be considered as indigenous stocks for the stream on which the hatchery is located.

B.

Fish of the same species as those to be counted will not be released into spawning fish index survey areas so as to affect said index areas. See specific species plans and basin management plans for stocks appropriate to areas of the state and to individual watersheds. Standard index area listings can be provided upon request.

Release of fish into specific index areas or into areas not yet covered by basin plans may be authorized by the Assistant Director, Fisheries.

C.

Introduction of species or stocks not already found in a waterbody or stream system must be carefully considered. A guide for proposing and processing new introductions follows.

1. Specifics of ongoing and past rearing and transfer practices or stocks introduced are shown in management plans, fish production records, or other lists.

2. Public waters are those available to the public for fishing, whereas private waters (as used herein) are those which have restricted access for public fishing. All waters are waters of the State, however.

Developing Fish Introduction Proposals

The attached Fish Introduction Proposal format is provided to be used by anyone (ODFW or others) who proposes to introduce a species or strain of game or nongame fish onto Oregon waters where they do not already exist or where they have not existed in the past. Region and staff review is required for all such introductions. Final staff approval or rejection will be made by the assistant director, Fisheries. The format will standardize the practice of requesting fish introductions and will assure that all persons concerned with such an introduction will have an opportunity to review the proposal and file their comments, recommendations, approvals, or rejections.

The fish introduction proposal format is to be used as follows:

1. The district (research, or citizen club, group, individual, etc. working with the biologist) contemplating making the introduction is normally the originator of the written proposal. Parts I, II, and III should be completed giving as much information as necessary to clearly explain the proposal. The proposal is then forwarded to the regional supervisor. An information copy should also be sent to the appropriate staff biologist at the Portland office.

2. The regional and assistant regional supervisors review the proposal making necessary comments and forward the Proposal Comment to Portland (Attention: Fish Introduction Coordinator (FIX)).

3. The proposal with region's comments will be routed, by the FIX, through the Portland staff for review. Comments will be solicited from other ODFW sections and outside agencies as appropriate to the particular proposal.

4. Final collation will be handled by the FIX who is responsible for inclusion of all comments.

5. Review and approval (or rejection) of the proposal by Assistant Director, Fisheries, is required before it can be included in the management plan for that body of water.

6. Appropriate response is sent to the region and the originating district biologist.

7. Inclusion in a management plan for the pertinent water body, stream system, or basin with appropriate review and acceptance of the plan.

Format for a fish Introduction Proposal

TO: Region/Portland Headquarters Fishery Staff (Attention FIX)

FROM: (Originator of Proposal)

The following proposal to introduce (species) , into an Oregon water is being submitted for approval:

I. WATER: name .

Tributary to --(name of stream and system)
Section --(if a stream)
Watershed --(asin)

II. PRESENT STATUS OF RECEIVING WATER:

History of watershed in general
Existing fish populations
Fisheries, etc.

III. PROPOSAL:

A. Species --
Strain -- (primarily for salmonids)
Stock Source -- (origin of fish)
Disease history of place of origin
Stock spawning time
Stock migration pattern (timing, freshwater, ocean)
General review of the species in its native area (include ability to compete with other species, reproduction rate, etc.).
Number and Size
Time of Release

B. Objective

C. Justification

Management Need

D. Expected Impact

Advantages and Disadvantages

Effects on Existing Fish Populations

1. Rearing competition potential with existing stocks.

2. Conflicts in spawning time with existing stocks. Effects on Existing Fish Populations

Possible conflicts with other programs in the watershed (Management, Research, Cultural Planning Zoning, etc.).

Possible genetic concerns.
Potential use or contribution of introduced species.

E. Evaluation of Results
Methods for evaluating results
Period of evaluation

F. Economics
Cost of Introduction
Benefits, etc.
Method of financing introduction and evaluation

G. Additional comments or information.

IV. REGIONAL OFFICE:

Regional supervisor or assistant will add necessary comments, recommendations, signature, date of review, and forward to Fish Introduction Coordinator (FIX) as Portland Headquarters.

V. FISH INTRODUCTION COORDINATOR

Receives proposal for introduction and confers with the appropriate staff specialist for the species to be introduced, then sends a copy to the following for review, additional comments, and recommendations (if comments have not been included previously).

A. Pathologist

Review and add comments, recommendations, signature, and date on a separate memo and return to the FIX.

B. Other agencies as necessary

C. Research and Development Personnel Review and add comments, recommendations, signature, and date on a separate memo and return to the FIX.

D. Fish Division Staff

Review and add comments, recommendations, signature, and date on a separate memo and return to the FIX.

E. Assistant Chief, Fisheries (after other comments are attached)

Review proposal and all correspondence, add comments, recommendations, signature, date, and send to FIX for submission to Assistant Director, Fisheries..

VI. ASSISTANT DIRECTOR FISHERIES (after review by Assistant Chiefs):

Make final decision to approve or reject proposal. Return proposal to FIX. (Approval is only authorization to proceed with development of a management plan for the water body(s) involved).

VII. FISH INTRODUCTION COORDINATOR

Send copy (or packet) to regional and originating district biologist for their record and action if appropriate.

VIII. DISTRICT BIOLOGIST/REGION

Prepare management plan as needed for review via normal management plan development procedures.

APPENDIX E.

Oregon Administrative Rules direction relative to planning efforts.

OAR 635-07-501 Definitions

(14) "Goal" means a philosophical statement and desirable direction of an ODFW program which leads to agency policy and then to rules and operation plans for implementation.

(18) "Management plan" means:

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

(b) Which may include specific information or alternatives relative to how goals and policies can be achieved, e.g. techniques and guidance for implementation of the basic plan normally found in operation plans.

(22) "Objective" means a specific statement of planned results to be achieved by a predetermined date. Once achieved, objectives represent measurable progress toward attainment of the broader goal.

(23) "Operation plan" means an action plan developed by the Department that generally addresses how the objectives in a management plan for a specific geographic area or harvest, and production of a species will be attained.

(25) "Policy" means overall rule to embrace the goals and acceptable general procedures.

OAR 635-07-510 Goals of Fish Production and Management

Goals of fish production and management will be:

(1) The Fish and Wildlife Commission will adopt in public hearing management plans for fish species.