COAST FORK WILLAMETTE SUBBASIN

Fish Management Plan

Oregon Department of Fish & Wildlife

Coast Fork Willamette Subbasin Fish Management Plan

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TABLE OF CONTENTS

CONTENTS (continued)

INTRODUCTION

The Fish Management Policy of the Oregon Department of Fish and Wildlife (ODFW) requires that management plans be prepared for each basin or management unit. The area covered by the Coast Fork Willamette Subbasin Fish Management Plan includes running waters of the Coast Fork Willamette River and its tributaries. Fish management plans for Dorena and Cottage Grove Reservoirs were adopted in 1986.

Basin plans provide the public and other agencies the opportunity to help formulate ODFW management programs. They also provide a comprehensive approach to management of all fish species, and establish management priorities so that the Department's funds and personnel can be used accordingly. Basin plans place in law (Oregon Administrative Rules) the goals, objectives and policies of basin management.

Preparation of this plan was guided by species plans for trout (ODFW 1987a) and warmwater game fish (ODFW 1987b), and the Willamette Basin Fish Management Plan (ODFW 1988). The species plans contain statewide management goals, guidelines, and objectives that provide general direction for basin management plans. The Natural Production and Wild Fish Management Policy (ODFW 1990), Manual for Fish Management (ODFW 1977), a Department Guide for Introductions and Transfers of Finfish into Oregon Waters (ODFW 1982) and Fish Disease Control Guidelines (ODFW 1979) also guide fishery resource management.

The Coast Fork Willamette Subbasin Fish Management Plan was developed with the assistance of a public advisory committee and a technical advisory committee. The public advisory committee represented user groups and other interested citizens. The function of this committee was to serve as a sounding board for public interests. Members of this committee were:

Member	Affiliation
Bob Bumstead	McKenzie Flyfishers
Rod Hatter	Emerald Bass Club
Glen Hills	Unaffiliated
Mark Hoy	Unaffiliated
Richard Johnson	Northwest Steelheaders
Bill Laing	McKenzie Flyfishers
Michael Marczuk	McKenzie Flyfishers
Lynn Moore	Unaffiliated
Greg Pitts	Cascade Family Flyfishers
Don Wouda	McKenzie Guides

The technical advisory committee was composed of representatives of federal and private land management agencies and federal fisheries management agencies. This committee reviewed drafts of the plan. Members of this committee were:

Member	Affiliation
Bill Chapman	Lane County Parks
Wayne Elliot	Bureau of Land Management
Ken Kestner	Rigdon Ranger District, USFS
Thom Lanfear	Lane County Land Management Division
Rick Scott	Lowell Ranger District, USFS
Bob Walters	Bureau of Land Management
Herb Wick	Rigdon Ranger District, USFS
Jim Wieman	Cottage Grove Ranger District, USFS

The habitat and anadromous fish sections were originally prepared as part of the Integrated System Plan for Salmon and Steelhead Production in the Columbia River Basin (Columbia Basin Fish and Wildlife Authority, 1990). These sections have been modified to fit ODFW's format for subbasin plans.

Sections of this plan cover habitat, the major species or groups of species, and angling access. Each of these sections contains:

1. Background and Status -- information that explains the context of the policies, objectives and actions.

2. Policies -- constraints for the objectives and actions.

3. Objectives -- what is to be accomplished.

4. Actions -- how the objective will be achieved.

GENERAL CONSTRAINTS

Besides the statewide species plans and the Willamette Plan, the Coast Fork Willamette Plan must also conform to other established constraints such as federal acts (e.g., Wild and Scenic Rivers, Wilderness, Endangered Species), state statutes, administrative rules, memoranda of understanding and other policies.

Legal Considerations

The Oregon Forest Practices Act (ORS 527.610 to 527.730) was adopted in 1972 and is administered by the Oregon Department of Forestry. Forest Practices Rules regulate commercial timber operations on state and private land and contain provisions to protect aquatic habitat. USFS and BLM have agreed to meet or exceed Forest Practices Rules and state water quality standards. The Forest Practices Act does not apply within the urban growth boundary of towns and cities which may or may not have regulations for stream protection.

The Oregon Removal-Fill Law (OAR 141-85-005 to 141-85-090) requires a permit for the removal or filling of 50 cubic yards or more of material in natural waterways. The Division of State Lands issues permits and enforces the law. the Department has the opportunity to recommend conditions on permits to protect fish and wildlife.

DEQ has developed state water quality standards that are in compliance with federal standards. DEQ administrative rules (Chapter 340, Division 41) address water quality standards for the Coast Fork Willamette subbasin.

The Oregon Land Conservation and Development Commission has developed statewide planning goals. Goal 5, which addresses fish and wildlife habitat, and Goal 6, which addresses water quality, affect fishery resources. Lane County has adopted a land use plan.

The Willamette River Greenway Program, administered by State Parks, includes 29.7 miles of the Coast Fork Willamette from its mouth up to Cottage Grove Dam.

Water rights have not been adjudicated in the Coast Fork Willamette subbasin.

Senate Bill 140 (ORS 537.332 through 537.360) directed the Water Resources Commission to convert minimum streamflows to in-stream water rights. In 1989 the Oregon Fish and Wildlife Commission adopted OAR 635-400-000 through 635-400-040 to identify procedures (including amount of flow) to be followed by the Department in applying for in-stream water rights.

Oregon Senate Bill 523 of 1985 initiated a coordinated effort among state agencies for planning and managing water resources.

Oregon House Bill 2990 exempts streams having anadromous fish from hydroelectric development. The Protected Areas program of the Northwest Power

Planning Council extended protection to streams significant to resident fish. A total of 123 miles of stream are protected from hydroelectric development in the Coast Fork Willamette subbasin.

Agreements with other Agencies

Each of the land and water management agencies in the Coast Fork Willamette subbasin has regulatory authority over some aspect of land or water use, or has overall responsibility for specific geographic areas. Each of these agencies has its own policies, procedures, and management directives associated with its area of responsibility. ODFW coordinates with these agencies regarding their habitat protection and management programs. Applications for permits issued by other agencies are forwarded to ODFW to review and recommend conditions or denial to avoid impacts on fishery interests. The role of ODFW in habitat protection is not usually through direct management, however, the Department does have authority to require fish screens and fish passage, can apply for in-stream water rights to protect fish habitat and can collect value of fish and wildlife destroyed and costs of habitat restoration from polluters.

Memoranda of understanding among ODFW and the Bureau of Land Management (BLM), U.S. Forest Service (USFS), and the U.S. Army Corps of Engineers (USACE) describe cooperative activities for protecting and improving fish habitat on federal lands. ODFW reviewed the Umpqua National Forest Plan (USFS 1990) and will comment on a new BLM management plan for western Oregon to be completed in the early 1990s. Forest Service and BLM fish habitat improvement projects are closely coordinated with ODFW. Annual contracts with USACE have been established to mitigate for fish production lost as a result of USACE projects.

USACE coordinates its annual operating plan for Willamette Basin reservoirs with the State of Oregon through the Water Resources Department. ODFW recommends opportunities to protect fish and wildlife through reservoir and downstream flow manipulation based on each year's water supply forecast.

The Oregon Water Resources Department (WRD) is updating its water management plan for the Willamette Basin (WRD 1985). The plan affects future water rights, sets priorities for water use, and prescribes actions to solve water problems. ODFW has identified issues for the planning process.

The Governor's Watershed Enhancement Board provides an opportunity for individuals and organizations to be involved in watershed rehabilitation. The board includes a member of the Oregon Fish and Wildlife Commission.

General Policies

The following general policies apply to all subbasin plans in the Willamette basin, including the Coast Fork Willamette subbasin.

Policy 1. To the extent authorized by law, the Department shall seek compensation for losses of production due to development and other man-made causes.

Policy 2. Hatchery production shall be evaluated to determine if benefits exceed costs.

Policy 3. The number of hatchery fish stocked in the Willamette Basin, regardless of species and size, shall not be increased and stream systems not currently receiving hatchery fish shall not be stocked, with the following exceptions:

(a) Experimental programs where the number of fish released is relatively small and a planned and funded evaluation program exists;

(b) Rehabilitation programs for native species;

(c) As provided for in subbasin plans adopted by the Commission in public hearing; and

(d) Special situations approved by the Commission in public hearing.

Policy 4. Stocking levels and areas shall be addressed in subbasin plans.

HABITAT

Background and Status

Basin Description

The Coast Fork Willamette subbasin (Figure 1) has about 600 perennial streams that drain 665 square miles (SWRB 1961). Most (96%) of the watershed is in Lane County and a small portion (4%) is in Douglas County. Big River and Saroute Creek rise in the Calapooya Mountains and join to form the Coast Fork Willamette River. The Coast Fork Willamette traverses 40 miles from its origin to its mouth. The Row River, which enters the Coast Fork Willamette at River Mile (RM) 20.7, drains nearly 60% of the subbasin (WBTF 1969). The Coast Fork Willamette joins the Middle Fork of the Willamette River just south of Eugene to form the Willamette River.

Over 90% of the subbasin is mountainous with about 75% over 1,000 feet in elevation and about 40% over 2,000 feet (SWRB 1961). Fairview Peak is the highest point at 5,993 feet. The lowest point is 430 feet at the mouth of the Coast Fork Willamette. Stream gradients are generally higher in the upper reaches of the subbasin than in the lower and middle portions (Figure 2). In turn, natural barriers to upstream movement of fish, such as falls, are more prevalent in the upper subbasin.

Upland vegetation varies markedly with elevation and as a direct consequence of changes in topography and precipitation (Franklin and Dyrness 1973). Primary tree species include Douglas fir, western red cedar, white fir and grand fir. Hardwood species occur as subordinate species in some stands of conifers or as relatively pure stands in localized areas (USFS 1987b). Much of the upper subbasin has been logged and replanted with commercial species of conifers. Lowlands in the subbasin have been modified by human activity to create a mosaic of oak woodlands, coniferous forests, grasslands and chaparral-type shrub communities (Franklin and Dyrness 1973).

Riparian zones are dominated by canopies of cottonwood, red alder and bigleaf maple. Grasses and sedges can be locally abundant. Vegetative complexity varies as a result of the many combinations of elevations, topography, aspect, stream gradient, soil and stream width (USFS 1987a). Plant species distribution and mix have been highly modified by logging and farming activities in localized areas. In general, riparian zones in the upper subbasin provide adequate shade to streams (N. Armantrout, BLM, personal communication), but are deficient in other aspects (such as inputs of large woody debris) as a result of the intense logging activities.

Streamflows mimic seasonal precipitation patterns. Extremes in flow are moderated by Dorena and Cottage Grove dams. Average monthly discharge near the mouth of the Coast Fork Willamette ranges from 180 cfs in August to 3,760 cfs in December and averages 1,500 cfs (Table 1). Minimum streamflow standards are largely achieved by releases from these dams. Many smaller tributaries in the upper basin are intermittent as a result of geologically poor aquifer development (SWRB 1961).

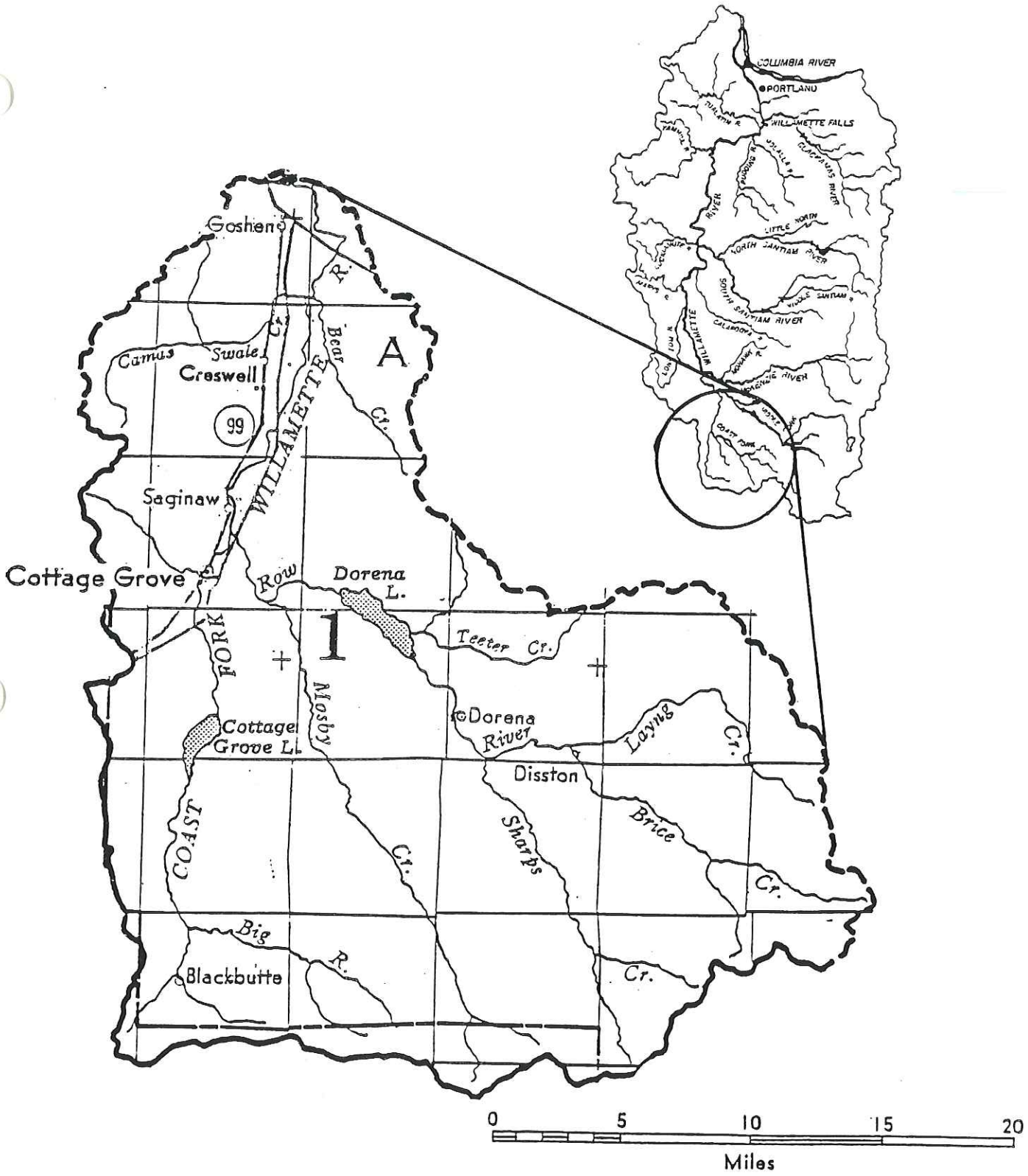

Figure 1. The Coast Fork Willamette subbasin.

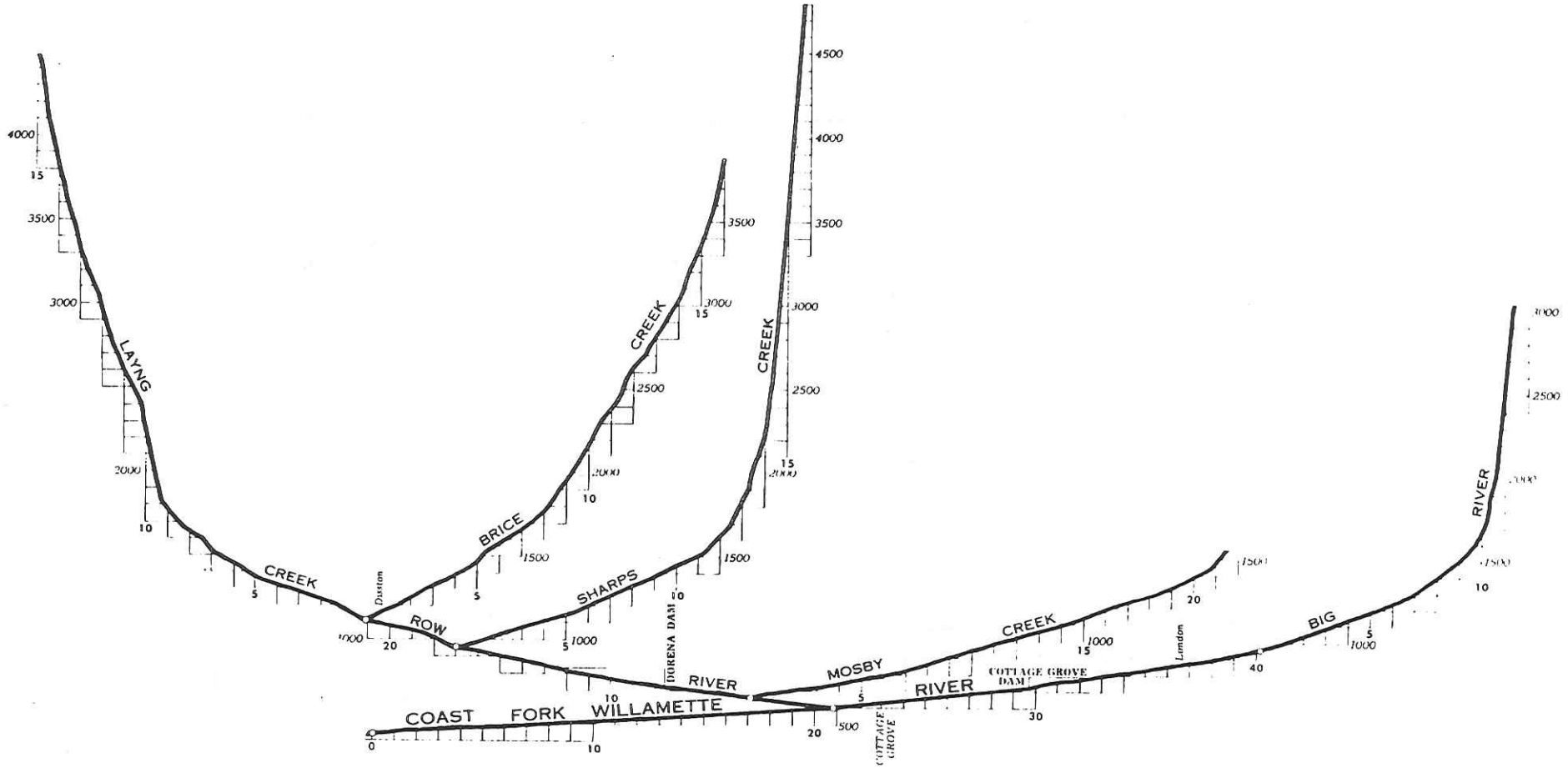

Figure 2. Profiles of stream gradients in the Coast Fork Subbasin (SWRB 1961).

Table 1. Monthly and annual discharges at five locations in the Coast Fork Willamette subbasin for 1977-86 (USGS, unpublished).

Station	Mean discharge (cfs)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Coast Fork Willamette at Goshen													
	2,169	2,852	1,672	1,743	995	591	225	181	801	982	1,834	3,663	1,467
Coast Fork Willamette below Cottage Grove Dam													
	335	422	228	227	122	94	54	49	234	241	323	610	245
Coast Fork Willamette at London													
	261	392	273	277	150	77	29	19	29	52	233	412	182
Row River near Cottage Grove Dam													
	973	1,188	660	838	524	355	134	124	542	643	850	1,755	713
Mosby Creek at mouth													
	299	353	284	295	184	72	20	12	32	44	214	431	186

Fish distribution and production potential in the Coast Fork Subbasin can be roughly delineated by upper values of water temperature. Streams above Cottage Grove and Dorena reservoirs rarely exceed 70 F and are generally within desirable ranges for salmonids. Higher water temperatures prevail downstream of the dams (Table 2), which favors production of warmwater species (WBTF 1969).

Streams above Cottage Grove and Dorena reservoirs rarely exceed 70° F and are generally within desirable ranges for salmonids. Higher water temperatures prevail in the reservoirs

Mercury has been found in fish from Cottage Grove Reservoir and throughout the length of the Coast Fork Willamette (Klaudy Letter to Max Smith, ODFW, Springfield, received December 2, 1987). Health authorities have suggested limited consumption fish from this area. Contribution of mercury mining activities in the watershed to the problem is unknown.

Cottage Grove and Dorena reservoirs are turbid in winter months as a result of wave action and sediment loading from storms and human activity upstream. Water from the reservoirs carries sediment that contributes to siltation in the Coast Fork Willamette and Row River.

Water quality data collected by the Oregon Department of Environmental Quality (DEQ) is presented in Table 2. Additional data collected by DEQ from the Coast Fork Willamette (RM 3 and RM 6.4) indicate high bacterial counts and

periodic low dissolved oxygen. Because DEQ recently declared the Coast Fork Willamette "water-quality limited" (J. Johnson, DEQ, personal communication), the system will be monitored more extensively to determine extent and causes of the problems.

Table 2. Water quality characteristics of the Coast Fork Willamette subbasin (DEQ, unpublished).

Location	Seasonal[a] mean values			
	Winter	Spring	Summer	Fall
Coast Fork Willamette at US 58 Bridge (RM 5.6)				
pH	7.0	7.2	7.3	6.9
Temperature (°F)	45.1	52.7	62.8	51.6
Dissolved Oxygen (mg/l)	11.6	10.3	9.0	10.5
Turbidity (FTU)	15.3	8.1	3.1	16.0
Coast Fork Willamette at Creswell, OR				
pH	--	8.3	8.1	7.1
Temperature (°F)	--	77.0	71.8	60.8
Dissolved Oxygen (mg/l)	--	9.9	10.0	9.4
Turbidity (FTU)	--	--	--	--
Coast Fork Willamette at Frank Parrish Road				
pH	7.3	7.6	7.8	7.2
Temperature (°F)	43.5	61.3	67.9	49.9
Dissolved Oxygen (mg/l)	11.7	10.3	9.2	10.8
Turbidity (FTU)	15.2	7.5	2.8	11.1
Row River at County Road Bridge				
pH	--	7.8	8.0	--
Temperature (°F)	--	66.2	63.2	--
Dissolved Oxygen (mg/l)	--	9.8	10.4	--
Turbidity (FTU)	--	--	--	--

[a]Winter = Jan-Mar; Spring = Apr-Jun, Summer = Jul-Sep; Fall = Oct-Dec.

Land Use

The majority (64%) of the 426,437 acres of land is privately owned with the balance under federal ownership. Management of federal lands is almost equally divided between the Umpqua National Forest (20%) and the Bureau of Land Management (16%).

Commercial forest covered 84% of the Coast Fork Willamette subbasin in 1969 (WBTF 1969) including all headwater drainages. Much of the forested land has been logged at least once. Before forest practices were modified to protect streams, high erosion, channel-cutting, debris dams, and extreme losses of riparian and in-stream cover were common. Timber harvest can cause increased sedimentation and siltation of streams and has had significant impacts on fish production in the upper Coast Fork Willamette subbasin (Sharps Creek) (USFS 1987b). Soil on the steeper slopes of the Calapooya Mountains in the upper Coast Fork Willamette subbasin are particularly susceptible to erosion (WBTF 1969).

Less than 10% of the Coast Fork Willamette subbasin is suitable for agricultural crops (SWRB 1961). In the upper subbasin, cultivated land is largely restricted to valley floors of the Coast Fork Willamette, Row River and Mosby Creek. Downstream (north) of the town of Creswell, the valley widens and supports the major agricultural activity in the subbasin. Negative effects of agriculture on fish production have been minor.

The Bohemia Mining District in the upper Row River drainage has been the most productive mining district of the Cascade Range (SWRB 1961). Mines have yielded gold, silver, copper, lead, zinc, and antimony. Activity in the area today is limited, however interest in recreational mining appears strong. Mercury has been intensively mined from the Black Butte area in the upper reaches of the Coast Fork Willamette. The Hobart Butte area on the west side of the upper Coast Fork Willamette has been mined for high grade refractory clay. These clay deposits hold contain alumina that may be mined in the future. Sand and gravel are extensively mined from the lower subbasin.

The most significant residential and commercial development is around the town of Cottage Grove. Cottage Grove straddles both banks of the Coast Fork Willamette and has extensively modified the river's path and riparian vegetation for over two miles. Other population centers include Creswell. The Eugene/Springfield metropolitan area is nearby. Rural residential structures are prevalent. Lumber mills at Cottage Grove and Culp Creek are potential sources of pollution.

Cottage Grove Dam on the Coast Fork Willamette and Dorena Dam on the Row River were completed in 1942 and 1949, respectively. These dams are operated by USACE for flood control, irrigation and navigation. They also provide recreation, in-stream flows, and pollution abatement. Neither of the projects have fish passage facilities and together they eliminated about 80 miles of stream habitat for anadromous salmonids (USACE 1982). Wave action erodes unstable soils causing turbidity in the reservoirs and below the dams (Hutchison et al. 1966a). Temperature of the water in the reservoirs increases during the summer months and the release of the warm water appreciably reduces the value of the lower Row River and Coast Fork Willamette for production of salmonids (Hutchison et al. 1966a; USACE 1982).

Significant portions of flow in the subbasin have been appropriated for out-of-stream uses (Table 3). However, little water is actually taken (Table 4). Minimum in-stream flows are listed in Table 5.

Table 3. Water rights in the Coast Fork Willamette subbasin (WRD, unpublished).

Stream	Water use (cfs)					Total
	Agriculture	Industrial	Municipal	Domestic	Recreation	
Coast Fork	59.8	11.0	7.5	>0.1	>0.1	78.4
Berkshire Cr.	2.4	0	0	0	0	2.4
Bear Cr.	8.3	0	0	>0.1	0	8.3
Camas Swale	4.3	0	0	>0.1	0	4.3
Hill Cr.	6.8	0	0	0	0	6.9
Gettings Cr.	3.2	0	0	0	0	3.2
Silk Cr.	0.7	0	1.0	>0.1	0	1.7
Row R.	24.2	0	12.2	0	0	36.4
Mosby Cr.	2.0	0	0	0	0	2.0
Rat Cr.	2.5	0	0	>0.1	0	2.5
Culp Cr.	3.2	0	0	0	0	3.2
Sharps Cr.	3.9	0	0	0	0	3.9
Layng Cr.	0	0	8.0	0	0	8.0
Other	9.6	0.2	0	0	0.1	10.0
Total	131.1	11.2	28.7	>0.1	0.2	171.3

Table 4. Surface water withdrawals by use category in the Coast Fork Willamette subbasin (USGS, unpublished).

Use	Quantity (cfs)
Public supply	1.52
Domestic	0.31
Irrigation	4.97
Livestock	0.50
Industrial	1.90
Total use	9.19

Table 5. Minimum in-stream flows adopted for streams of the Coast Fork Willamette subbasin (WRD 1985).

Location	Minimum flow (cfs)		Priority date
	Natural	Storage releases	
Coast Fork Willamette above confluence with Row River	15	100	6-22-64
Row River at mouth	40	150	6-22-64
Coast Fork Willamette at mouth	40	250	6-22-64

No federally designated wilderness areas exist in the Coast Fork Willamette subbasin. ODFW (Letter from Randy Fisher, ODFW, Portland, to K. Norm Johnson, Oregon State Department of Forestry, Salem, dated May 12, 1988) reviewed the draft Umpqua National Forest Plan (USFS 1987b) and supported the proposed allocations (with recommended changes) for roadless areas as follows: Hardesty Mountain (2,555 acres), Bulldog Rock (6,997 acres), Fairview (7,648 acres), and Pudding Rock (5,502 acres).

Policies

Policy 1. **The Department shall actively pursue and promote habitat protection and improvement necessary to achieve the objectives for management of the subbasins' fish resources.**

Policy 2. **The Department shall coordinate with and advise agencies that manage the land and water resources of Willamette subbasins.**

Policy 3. **Habitat protection shall be emphasized over habitat rehabilitation and enhancement.**

Policy 4. **Potential losses of fish production from habitat alteration shall be prevented or reduced to the extent possible.**

Objectives

Objective 1. **Protect fish populations from impacts caused by land use activities.**

Assumptions and Rationale

1. Maintaining high quality habitat is essential to maintaining self-sustaining fish populations.

2. Logging and related activities on steep slopes and highly erodible soils can be particularly damaging to fish habitat.

3. Water withdrawals reduce available habitat and increases water temperatures.

4. In-stream water rights and conditions on water use permits, state and federal water quality standards, and zoning restrictions help protect fish habitat.

5. Removal of large woody debris and gravel from streams destroys fish cover and pool habitat, reduces channel stability and increases bank erosion.

6. DEQ recently declared the Coast Fork Willamette a "water quality limited" stream.

7. Cottage Grove and Dorena dams have altered patterns of water flow causing some unfavorable conditions for fish, but water releases help abate pollution downstream.

8. Dorena and Cottage Grove dams reduce recruitment of gravels downstream.

Actions

1.1 Reduce impacts of logging and related activities on fish habitat by assisting DOF in applying the Forest Practices Rules and working with BLM and USFS to protect aquatic habitat from degradation resulting from timber harvest.

1.2 Identify stream reaches needing protection and apply for in-stream water rights.

1.3 Review permits, make on-site inspections and perform other such activities in order to assist WRD, DSL, USACE, Lane County and other agencies in protecting habitat.

1.4 Ensure minimum flows are released from Dorena and Cottage Grove dams.

1.5 Reduce impacts of diversions on fish by working with the watermaster to ensure that withdrawals do not exceed water rights.

1.6 Ensure that all diversions are properly screened and maintained.

1.7 Investigate fish kills resulting from spills of hazardous materials and collect value of fish and wildlife destroyed and costs of habitat restoration from polluters.

1.8 Encourage USACE to include the Coast Fork Willamette subbasin in the Willamette System Temperature Control Study. This study will determine the effect of dams on water temperatures downstream and the costs and benefits of retrofitting the dams to regulate the temperature of water released.

Objective 2. Restore and enhance riparian and in-stream fish habitats.

Assumptions and Rationale

1. Habitat restoration and enhancement will increase natural production.

2. Restoration and enhancement projects can play an important role in education and consolidation of support for fishery resources.

3. Current physical and biological stream surveys do not adequately identify habitat factors that limit production and allow evaluation of habitat enhancement needs.

Actions

2.1 Update existing physical and biological stream surveys and conduct new surveys. Supplement ODFW efforts with volunteers, sporting clubs, private landowners, and public land management agencies.

2.2 Establish basin-wide priorities and implement habitat restoration and enhancement projects.

2.3 Identify unnatural barriers to fish passage such as road culverts, diversion structures and check dams. Work with landowners, volunteer groups and individuals to obtain compliance with ODFW fish passage statutes.

2.4 Implement ODFW fish screening statutes based on priorities developed through the ODFW Screen Report and basin planning

2.5 Work with Weyerhaeuser to develop routine maintenance duties for their dam in Cottage Grove (RM 25).

WINTER STEELHEAD

Background and Status

Origin

The Coast Fork Willamette subbasin is believed to have supported a small run of winter steelhead before the construction of cottage grove and Dorena dams in the 1940s (Hutchison et al. 1966a). Winter steelhead are considered absent from the Coast Fork Willamette subbasin, although adults may occasionally stray from the nearby Middle Fork subbasin.

Hatchery Production

Winter steelhead were released from 1950 through 1960 to reestablish a run and a fishery (Hutchison et al. 1966a). Small sporadic runs in the Coast Fork Willamette and Row rivers were reported in the 1950s and 1960s. Hutchison et al. (1966b) observed 7 winter steelhead redds in 1966 from which Clady (1971) estimated a total run of 21.

Angling and Harvest

Catch of winter steelhead was low according to ODFW punchcard estimates (Table 6). The subbasin has been closed to steelhead angling since 1981.

Table 6. Angler catch of winter steelhead in the Coast Fork Willamette subbasin from punch card estimates (ODFW 1987).

Run year	Catch
1977-78	12
1978-79	20
1979-80	3
1980-81[a]	0

[a] The Coast Fork Willamette has been closed to steelhead angling from 1981 to present.

Management Considerations

Winter steelhead in the Coast Fork Willamette is not included on ODFW's list of wild fish populations. The program to reestablish winter steelhead is believed to have failed because of unsuitable habitat conditions. Cottage Grove and Dorena dams block upstream and downstream passage to potential spawning and rearing areas (USACE 1982). Warmwater and non-game fish species may prey on or compete with juvenile salmonids below Cottage Grove and Dorena dams (Hutchison et al. 1966a). USACE dams dampen freshets that facilitate smolt and adult migrations.

Policies

Policy 1. The Coast Fork Willamette subbasin shall not be managed for winter steelhead.

SPRING CHINOOK

Background and Status

Origin

Spring chinook are native but were probably never abundant in the Coast Fork Willamette subbasin (Willis et al. 1960). Dorena and Cottage Grove dams were built without upstream fish passage which blocked spring chinook from their spawning areas. Dimick and Merryfield (1945) did not observe any spring chinook in the subbasin in 1944, but gathered verbal reports of spring chinook spawning in the Row River prior to construction of Dorena Dam. Mattson (1948) did not include the Coast Fork Willamette subbasin as a major spawning area.

Hatchery Production

The U.S. Fish and Wildlife Service constructed an experimental hatchery below Dorena Dam to test the suitability of reservoir water for hatching spring chinook. The hatchery operated in 1951 and 1952. The reservoir water was deficient of oxygen and too warm for rearing salmonids (Willis et al. 1960). However, the major problem may have been hydrogen sulfide. The experiment was terminated at about the time that hydrogen sulfide would have ceased being a problem (E. Smith, ODFW, personal communication). Juvenile spring chinook were released in 1950 followed by releases in 1953 and 1955.

Cottage Grove Reservoir was stocked from 1969 through 1976 as part of a reservoir rearing study (Table 7). Survival of the 1971 brood year was 31% from fry to smolt and 0.11% from smolt to adult (Smith 1976). Other fry to smolt survival rates ranged from 16.1% for the 1974 brood to 0.1% for the 1970 brood (mean = 7%). Estimated annual returns from these releases were less than 100 adults in 1972 to 1974 and 300 in 1975. An estimated 1,800 spring chinook destined for Cottage Grove entered the mouth of the Willamette River in 1976 and about 350 returned to the Coast Fork Willamette (Smith 1976). ODFW conducted surveys between 1969 and 1983 and reported chinook redds in the Coast Fork Willamette from its mouth to Cottage Grove Dam and in Row River below Dorena Dam (Table 8). Although categorized as fall chinook redds, some redds were undoubtedly from spring chinook produced from releases in Cottage Grove Reservoir (E. Smith, ODFW, personal communication).

The only release made since 1976 was a relatively small number of fry in the Coast Fork Willamette in 1983.

Table 7. Releases of spring chinook in the Coast Fork Willamette subbasin[a] (ODFW, unpublished data).

Brood year	Release date	Number	Size	Location	Stock
1968	4/69	661,040	Fry	Big River	Willamette
	10/69	5,100	Smolt	Cottage Grove Res.	Willamette
1969	3/70	1,078,920	Fry	Cottage Grove Res.	Willamette
	4/70	282,986	Fry	Cottage Grove Res.	Willamette
	5/70	313,497	Fry	Cottage Grove Res.	Willamette
1970	3/71	359,280	Fry	Cottage Grove Res.	Wind River
1971	5/72	581,361	Fry	Cottage Grove Res.	N. Santiam
	5/72	536,870	Fry	Cottage Grove Res.	Fall Creek
1972	5/73	117,935	Fry	Cottage Grove Res.	Wind River
	5/73	1,001,918	Fry	Cottage Grove Res.	Wind River
1973	4/74	1,096,680	Fry	Cottage Grove Res.	Willamette
1974	4/75	1,113,600	Fry	Cottage Grove Res.	Willamette
1975	4/76	854,596	Fry	Cottage Grove Res.	Wind River
1982	3/83	146,366	Fry	Coast Fork Willamette	Dexter

[a] Prior to 1968, Juvenile spring chinook were released below Cottage Grove and Dorena dams in 1950, 1953, and 1955 (Willis et al. 1960).

Table 8. Number of chinook[a] redds observed from surveys conducted from late September to early October in the Coast Fork Willamette subbasin (compiled from Hansen 1977, 1978; Hansen and Williams 1979; Smith et al. 1982, 1983, 1985).

Location	Number of redds														
	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983[b]
Coast Fork[c]	8	92	8	30	17	11	10	1	1	2	1	4	17	7	7
Row River[d]	1	0	3	0	20	5	3	2	3	2	0	0	1	1	1

[a] Although conducted as fall chinook redd surveys, some of the observed redds were from spring chinook.
[b] No surveys have been conducted after 1983.
[c] Survey of 47.8 km from mouth to Cottage Grove Dam by plane.
[d] Survey of 12.2 km from mouth to Dorena Dam by plane.

Angling and Harvest

Punch-card estimates of catch for 1977 through 1980 are listed in Table 9. In 1976, before statistics for the Coast Fork Willamette were separated from the rest of the Willamette, Oregon State Police interviewed over 2,000

anglers who harvested 210 adult spring chinook below Cottage Grove Dam (Smith 1976). A much higher catch was possible, but the season was closed on June 10.

Table 9. Sport catch of spring chinook in the Coast Fork Willamette (ODFW 1989).

Run year	Number of fish
1975	--[a]
1976	--[ab]
1977	318
1978	737
1979	627
1980[c]	9

[a] Coast Fork Willamette catch not differentiated from Willamette River catch.
[b] Smith (1976) reported that Oregon State Police interviewed over 2,000 anglers who caught 210 spring chinook in the Coast Fork Willamette. Angling was closed June 10 due to low escapement at Willamette Falls.
[c] Closed to spring chinook angling after 1980.

Management Considerations

Dorena Dam on the Row River was constructed without upstream or downstream fish passage facilities which blocked access to spawning areas. Low flows in summer and release of warm water from Dorena and Cottage Grove dams during adult holding and spawning in late summer and early fall reduce the value of the Row River and Coast Fork Willamette below the dams for chinook salmon production (Hutchison et al. 1966a). Recent monitoring by DEQ (J. Johnson, DEQ, personal communication) revealed water quality problems, including low dissolved oxygen and high pH, in the Coast Fork Willamette during the summer months.

Smith (1976) noted that predators were abundant in Cottage Grove Reservoir, which required frequent chemical treatment to obtain adequate smolt survival and that relatively high levels of mercury in the reservoir resulted in accumulation in tissues which potentially affected survival of the smolts when they entered salt water. Smith (ODFW, personal communication) observed that flows were too low during critical periods for migration of adult spring chinook up the Coast Fork Willamette. Adults were vulnerable to snagging because of the low, clear water and many died before spawning.

Policies

Policy 1. Spring chinook salmon shall not be released into the Coast Fork Willamette subbasin.

FALL CHINOOK

Background and Status

Origin

Fall chinook are not native to the Coast Fork Willamette subbasin. Two stocks of fall chinook were introduced, Tule stock from the lower Columbia River in 1967 and Cowlitz stock from the Cowlitz River, Washington in 1972 through 1974. A self-sustaining run probably does not exist today, although tule stock fall chinook may occasionally stray from releases elsewhere in the Willamette basin.

Hatchery Production

Past releases are summarized in Table 10. Am estimated 500 adults returned in 1974 (Hansen 1977). Redd surveys (Table 11) and naturally produced fry (Hansen 1978, ODFW 1980) indicated some natural production resulted. Survival was suspected to be poor, because of intense predation by the abundant northern squawfish (Hansen 1978). Hansen (1978) found evidence that Cowlitz stock juveniles did not migrate out of the subbasin until fall.

Table 10. Releases of hatchery fall chinook in the Coast Fork Willamette subbasin.

Brood year	Stock	Release date	Hatchery	Number	Size	Location
1966	Willamette	3/67	Bonneville	241,638	Fry	Coast Fork
		3/67	Bonneville	184,797	Fry	Big River
1971	Cowlitz	6/72	Elk River	2,314,665	Fingerlings	Row River
1972	Cowlitz	5/73	Aumsville	495,675	Fingerlings	Row River
1973	Cowlitz	5/74	So. Santiam	202,824	Fingerlings	Row River
		5/74	Aumsville	1,976,005	Fingerlings	Row River

Table 11. Number of redds observed from early and late spawning stocks of fall chinook in the Coast Fork Willamette subbasin (compiled from Hansen 1977, 1978; Hansen and Williams 1979; Smith et al. 1982, 1983, 1985).

Year	Coast Fork[a]		Row River[b]		Mosby Creek	
	Early[c]	Late[d]	Early[b]	Late[c]	Early	Late[c]
1969	8	--	1	--	--[d]	--
1970	92	--	0	--	--	--
1971	8	--	3	--	--	--
1972	30	--	0	--	--	--
1973	17	--	20	--	--	--
1974	11	--	5	47	--	43
1975	10	44	3	55	--	48
1976	1	18	2	35	--	41
1977	1	--	3	--	--	18
1978	2	--	2	14	--	42
1979	1	--	0	--	--	--
1980	4	--	0	--	--	--
1981	17	--	1	--	--	--
1982	7	--	1	--	--	--
1983	7	--	1	--	--	--

[a] Survey of 47.8 km from mouth to Cottage Grove Dam by plane.

[b] Survey of 12.2 km from mouth to Dorena Dam by plane.

[c] Surveys conducted in early October.

[d] First adult returns were expected in 1974 from release of 1971 brood year juveniles. Surveys conducted in late November.

[e] No surveys were conducted after 1983.

Harvest

Some good catches of fall chinook in the Coast Fork Willamette occurred between 1975 and 1978 (Table 12), but catch could have been confused with spring chinook returning from releases in Cottage Grove Reservoir. Salmon angling has been closed since 1980.

Table 12. Sport catch of fall chinook from the Coast Fork Willamette subbasin[a] (ODFW 1989).

Run year	Catch
1975	434
1976	177
1977	64
1978	101
1979	0[a]

[a] Closed to angling for fall chinook since 1979.

Management Considerations

Past releases of early spawning tule stock and late spawning Cowlitz stock failed to produce self-sustaining runs. Natural production may be limited by competition and predation from non-game species and release of warm water from Dorena and Cottage Grove dams in the fall which accelerates egg incubation so that juveniles emerge during winter floods and at a time of low food supply. Returning tule adults could stray into the Middle Fork Willamette or McKenzie rivers and spawn with spring chinook.

Policies

Policy 1. Only releases of late spawning stocks with an evaluation program are allowed.

Objectives

Objective 1. Investigate introducing a run of late spawning fall chinook salmon.

Assumptions and Rationale

1. A late spawning stock would spawn when egg incubation temperatures are cooler and could not interbreed with native spring chinook in the McKenzie or Middle Fork Willamette Rivers.

2. Early spawning fall chinook such as tule are not allowed because of potential straying into the Middle Fork and McKenzie rivers and interbreeding with spring chinook.

3. Any releases of fall chinook will be evaluated through the ODFW stocking policy review process.

4. No releases of a late spawning stock are anticipated in the near future.

TROUT

Background and Status

Origin

Rainbow and cutthroat trout are native to the Coast Fork Willamette subbasin. Wild cutthroat trout are widely distributed and are found in almost all streams capable of supporting fish. Wild rainbow trout coexist with cutthroat trout in Mosby Creek and Row River.

Natural barriers have isolated cutthroat populations in many headwater areas of the subbasin. Cottage Grove Dam isolates cutthroat populations above the dam from those below the dam. Dorena Dam isolates both rainbow trout and cutthroat trout populations. Downstream migration over these barriers is possible which allows a one-way flow of genetic material between populations. Hatchery rainbow trout have been stocked for a number of years and may have interbreed to some extent with the native stock.

Life History and Population Characteristics

Densities of resident trout have not been systematically assessed. Based on miscellaneous creel and survey data, density of wild rainbow trout is low to moderate in Mosby Creek and Row River. Cutthroat trout are relatively numerous in most smaller, higher elevation tributaries (ODFW, unpublished data). They are the only salmonid present in many small and higher elevation streams. Densities of wild cutthroat trout are moderate in the lower reaches of the Row River, Mosby Creek, and upper Coast Fork Willamette from Cottage Grove to the headwaters and low in the lower Coast Fork Willamette.

Data on age and growth of wild rainbow trout is very limited. Five rainbow trout from the Row River were one year of age and ranged between 4.3 and 5 inches in fork length (Hunt 1982).

Age of cutthroat trout in small tributary streams in the Willamette system is often different from that of cutthroat trout in lower stream reaches (Moring and Youker 1979). In the upper Row River drainage, only 2 of 86 were older than two years (Table 13).

Table 13. Age structure of cutthroat trout collected by electroshocking in the Coast Fork Willamette subbasin.

Location	Sample size	Percent at age 0	1	2	3	4+
Row River[a]	86	0	62	36	2	0
Row River Rat and Mosby creeks[b]	58	21[c]	52	24	3	0

[a] Hunt (1982).
[b] Mooring and Youker (1979).
[c] All of these age 0 fish were captured from Rat Creek.

Length at age for cutthroat trout (Table 14) are within the range for other populations in the Willamette Valley (Moring and Youker 1979).

Native rainbow trout in the upper Willamette watershed spawn during spring months (ODFW 1987). Peak spawning in the McKenzie subbasin occurs in March and April (ODFW, unpublished information).

Cutthroat trout in the Willamette Valley spawn over a broad range of time, but mostly from January through March. The only months spawning activity has not been observed are July, October, and November (Moring and Youker 1979). Time of spawning may vary between lower and higher elevation streams and is most likely related to flow and water temperature cycles . (Moring and Youker 1979).

Table 14. Age specific lengths for cutthroat trout in the Coast Fork Willamette subbasin (Mooring and Youker 1979).

Location	Fork length (in) at age 1	2	3	4
Row River[a]	3.5-6.1	5.0-10.0	5.6-10.5	--
Row River drainage[b]	--	4.1-4.6	--	--

[a] Hunt (1982).
[b] Mooring and Youker (1979). Includes samples from Rat and Mosby creeks and the main stem Row River.

Miscellaneous creel data suggests that some hatchery rainbow trout migrate downstream from Dorena Reservoir during winter months.

An upstream movement of larger-sized cutthroat trout during late fall through early summer has been documented in other streams of the Willamette system such as the Marys (Wetherbee, ODFW, unpublished data) and McKenzie (Moring and Youker 1979) rivers. At least some of this movement is related to spawning (Nicholas 1978). Cutthroat trout in small tributaries, however, may exhibit minimal migration (Wyatt 1959; Aho 1977).

Hatchery Production

Hatchery cutthroat have not been released often. No legal-size fish have been released since 1973 (Table 15).

Table 15. Releases of cutthroat trout in streams of the Coast Fork Willamette subbasin, 1955-79[a].

Year	Number of fish released	
	Fingerlings	Yearlings
1967	0	4,500
1968	0	0
1969	0	0
1970	0	0
1971	0	0
1972	5,380	0
1973	20,056	0

[a] No cutthroat were released during 1955-67 and since 1973.

Hatchery rainbow trout are released annually and have generally been limited to legal-sized fish since at least 1955, the earliest date of available records. The lone exception was in 1958 when 79,487 fingerling rainbow trout were released. The number of stream sections stocked was reduced from six in the 1960s to two in the late 1970s (Table 16). Number of legal-sized trout stocked has varied between 4,006 and 19,680 during 1980-89, mostly Cape Cod stock with some Willamette stock.

Table 16. Releases of legal sized rainbow trout in streams of the Coast Fork Willamette subbasin, 1955-89.

Year	Coast Fork Willamette	Row River	Mosby Creek	Sharps Creek	Layng Creek	Brice Creek	Total
1955	0	13,759	2,602	2,974	2,398	2,398	24,131
1956	6,014	7,403	3,536	2,502	2,010	2,010	23,475
1957	9,911	7,009	4,004	3,003	2,001	2,000	27,928
1958	18,009	9,002	5,004	3,004	2,004	2,007	39,030
1959	12,031	15,998	6,001	4,001	3,999	3,098	45,128
1960	12,007	14,599	8,004	8,002	3,996	4,003	50,611
1961	8,003	16,066	6,602	6,000	3,998	1,176	41,845
1962	8,029	16,200	7,862	6,015	4,002	4,002	46,110
1963	8,075	16,595	7,964	6,000	4,002	3,999	46,635
1964	8,001	14,893	8,003	6,020	5,004	4,030	45,951
1965	4,000	11,972	6,003	6,004	3,002	3,002	33,983
1966	2,000	12,993	4,001	4,999	2,999	3,000	29,992
1967	7,000	11,001	4,002	4,994	3,001	3,001	32,999
1968	7,999	12,003	3,999	5,000	3,000	2,995	34,996
1969	8,004	10,006	3,004	6,003	2,002	2,002	31,021
1970	7,996	10,001	2,998	5,002	2,000	2,000	29,997
1971	9,500	9,006	3,001	5,002	2,002	2,002	30,513
1972	9,993	9,487	3,000	4,967	2,000	0	29,447
1973	10,042	6,026	2,502	4,022	2,000	0	24,592
1974	10,002	12,006	0	3,002	0	0	25,010
1975	10,000	12,001	0	3,000	0	0	25,001
1976	9,496	10,501	0	0	0	0	19,997
1977	9,999	10,003	0	0	0	0	20,002
1978	9,601	10,000	0	0	0	0	19,601
1979	9,161	9,992	0	0	0	0	19,153
1980	10,003	9,677	0	0	0	0	19,680
1981	10,113	9,511	0	0	0	0	19,624
1982	5,937	8,951	0	0	0	0	14,888
1983	5,490	7,776	0	0	0	0	13,266
1984	3,654	5,481	0	0	0	0	9,135
1985	4,006	0	0	0	0	0	4,006
1986	4,006	0	0	6,021	0	0	10,027
1987	4,977	0	0	5,289	0	0	10,266
1988	3,985	0	0	6,059	0	0	10,044
1989	4,035	0	0	6,003	0	0	10,038
1990	1,989	0	0	2,998	0	0	4,987
1991	2,016	0	0	3,010	0	0	5,026

Angling and Harvest

Estimates of angler use and catch rate are not well substantiated. Therefore, estimates of total harvest of wild trout are impossible to make with any confidence. Miscellaneous creel surveys (ODFW, unpublished) suggest that catch of stocked rainbow trout approaches or exceeds 40% in the Coast Fork Willamette at Cottage Grove and is probably below 40% for Sharps Creek.

Management Considerations

Both rainbow and cutthroat trout are native to the Coast Fork Willamette subbasin. Wild cutthroat trout are found in almost all streams supporting fish and provide moderate intensity self-sustaining fisheries throughout the subbasin. Wild rainbow trout are confined to Row River and Mosby creek. They also provide moderate intensity self-sustaining fisheries. Releases of legal-size hatchery rainbow trout provide a popular fishery in downtown Cottage Grove and a less utilized fishery in Sharps Creek. These fisheries are much more intense than could be supported by natural production and add diversity to potential angling opportunities. Angling and competition between hatchery and wild trout may suppress wild cutthroat trout production in Sharps Creek.

The provisional inventory of stocks for the Wild Fish Management Policy lists cutthroat trout above and below cottage Grove and Dorena dams as separate populations, and rainbow trout above and below Dorena Dam as separate populations. This may change as new information is collected on life history characteristics, migration and barriers separating populations.

Policies

Policy 1. Rainbow trout shall be managed for natural and hatchery production and cutthroat trout shall be managed for natural production of the wild populations.

Objectives

Objective 1. Protect and enhance the productivity of wild cutthroat and rainbow trout populations.

Assumptions and Rationale

1. Protection, restoration and enhancement of high quality habitat will help maintain the genetic diversity and productivity of wild trout populations.

2. Better information on abundance and life history of cutthroat and rainbow trout will help identify habitat enhancement opportunities.

3. Willamette basin cutthroat and rainbow trout are listed as stocks of concern due to insufficient information regarding their status. Population and habitat inventory and monitoring should be a high priority.

4. Potentially unique populations of cutthroat trout exist above natural barriers. Dorena and Cottage Grove dams isolate portions wild rainbow and cutthroat trout populations.

Actions

1.1 Monitor distribution and relative abundance of wild cutthroat and rainbow trout.

1.2 Conduct life history studies of wild cutthroat trout.

1.3 Identify and implement habitat improvement opportunities for cutthroat and rainbow trout.

Objective 2. Provide self-sustaining fisheries for cutthroat trout and rainbow trout in streams not designated for release of hatchery trout.

Assumptions and Rationale

1. The widely dispersed fisheries in these areas for cutthroat and rainbow trout under general angling regulations best fit the Basic Yield alternative of the Trout Plan.

2. Wild cutthroat trout are available to anglers in most streams.

3. The Row River below Dorena Dam offers anglers a good seasonal opportunity to catch wild rainbow trout. Angler opportunity is often limited by regulation of flow from Dorena Dam.

4. There is limited potential for production of large numbers of large trout.

5. Angling pressure is relatively light.

6. Current harvest levels are unknown.

Actions

2.1 Improve monitoring of angler effort, harvest, and catch rate for wild cutthroat and rainbow trout.

2.2 Identify special angling regulations or other management actions for specific streams to enhance the diversity of trout fisheries.

Objective 3. Diversify angling opportunity by releasing legal-sized hatchery rainbow trout in areas restricted to the Coast Fork Willamette (RM 22-24) and Sharps Creek (RM 0-10).

Assumptions and Rationale

1. The high catch rates resulting from stocking hatchery trout attract many anglers that provide economic benefits to local communities. Angler participation can be evaluated relative to size of water stocked and proximity of the stocked water to other productive but underutilized trout fisheries.

2. Only streams included in the Department's current hatchery program will be stocked with hatchery trout. Current releases are 2,000 legal-sized rainbow trout in the Coast Fork Willamette within the city limits of Cottage Grove (RM 22-24), and 3,000 fish in Sharps Creek (RM 0-10).

3. Releases of legal-size trout in the Coast Fork Willamette in a park within the city limits of Cottage Grove provides a popular (especially among younger anglers) consumptive fishery, that best fits the Intensive Use alternative of Oregon's Trout Plan. The catch probably exceeds 40%.

4. Release of legal-size trout in Sharps Creek provides an angling opportunity that best fits the Basic Yield alternative of Oregon's Trout Plan. This fishery has not attracted a large number of anglers. Harvest may be substantially less than 40%. Angling and competition between hatchery and wild trout may suppress wild trout production. This program should be evaluated to ensure that it meets standards of Oregon's Trout Plan and Wild Fish Management Policy.

5. Hatchery fish released in Sharps Creek may contribute to downstream fisheries in Row River and Dorena Reservoir.

6. Cape Cod stock meets the reproductively isolated guideline of the Wild Fish Management Policy.

Actions

3.1 Release 5,000 legal-sized rainbow trout at sites between RM 22-24 of the main stem Coast Fork Willamette and RM 0-10 of Sharps Creek.

3.2 Monitor trends in abundance and harvest of wild trout.

3.3 Determine catch of hatchery produced trout and angler effort.

3.4 Modify stocking programs to conform to guidelines in the Trout Plan and the Wild Fish Policy if necessary based on impacts to the wild fish populations, angler effort and percent return of stocked fish.

WARMWATER FISH

Background and Status

Origin

Streams of the Coast Fork Willamette subbasin support naturally reproducing populations of largemouth bass, bluegill, brown bullhead and yellow bullhead. These species introduced into the Willamette basin into the 1800s. Smallmouth bass were introduced in the lower Coast Fork Willamette in the early 1980s (Table 17), however, no evidence of natural production has been found.

Table 17. Releases of smallmouth bass in the main stem Coast Fork Willamette (ODFW, unpublished).

Date released	Number released	Size released
November 1980	3,623	2-3"
October 1981	2,949	3-6"
July 1983	965	2-3"

Life History and Population Characteristics

Stream dwelling populations of warmwater game fish are generally restricted to the lower portion of the Coast Fork Willamette (Table 18). Specific data on the life history characteristics of warmwater game fish in the Coast Fork Willamette subbasin is lacking. The populations probably do not exhibit life history characteristics substantially different from the general descriptions presented in the Warmwater Game Fish Management Plan.

Table 18. Survey data of warmwater game fish in the Coast Fork Willamette River. All fish were collected with a boat electroshocker. (ODFW, unpublished data).

Site	Date	Species[a]	Number collected	Size range (in.)
RM 0- 6.4	8/79	LB	2	3.6-18.4
		BC	2	7.3- 9.0
		Bg	2	3.0- 5.2
		BrB	2	8.3- 8.5
		YB	1	6.5
RM 17-20.8	8/79	None	---	---
RM 27-29.4	8/79	None	---	---

[a] LB=Largemouth bass, BC=Black crappie, Bg=Bluegill, BrB=Brown bullhead, YB=Yellow bullhead.

Hatchery Production

Populations of warmwater gamefish are currently maintained by natural reproduction.

Angling and Harvest

Although little data exists on angler participation and harvest, effort is believed to be light.

Management Considerations

Streams of the Coast Fork Willamette subbasin provide limited opportunities for warmwater angling. Existing populations of warmwater game fish are small and are confined primarily to valley floor streams from Cottage Grove downstream. Demand for warmwater angling is increasing. The Coast Fork Willamette below Cottage Grove supports few salmonids but non-game fish such as squawfish, chiselmouth, peamouth, suckers and redside shiners are abundant.

Objectives

Objective 1. Maintain existing warmwater game fish populations.

Assumptions and Rationale

1. Existing populations of warmwater game fish will provide relatively stable, self-sustaining fisheries if habitat is protected, restored and enhanced.

Actions

1.1 Inventory distribution and abundance warmwater game fish in the Coast Fork Willamette below Cottage Grove Dam and the Row River below Dorena Dam.

1.2 Implement applicable habitat protection actions listed in the Habitat section.

1.3 Identify and implement habitat improvement opportunities for warmwater game fish.

Objective 2. Provide a diversity of warmwater angling opportunities.

Assumptions and Rationale

1. The broad range of opportunities with a variety of species and sizes of fish best fit the Basic Yield option of the Warmwater Game Fish Management Plan.

2. The angling effort for warmwater game fish would increase if the public were better informed of opportunities.

3. Introductions of new species of warmwater game fish such as smallmouth bass will increase angler effort and diversify fisheries.

4. Previous introductions of smallmouth bass (early 1980s) were unsuccessful in establishing a self-sustaining population. Definitive reasons for the failure are unknown, but it may be that habitat is insufficient or the stock, sites, size, number of fish or time of release were inappropriate.

Actions

2.1 Implement appropriate actions listed in the Access section.

2.2 Improve collection of information on angling effort and harvest.

2.3 Prepare a guide to warmwater angling opportunities in the Upper Willamette Valley.

2.4 Continue to inform the public of angling opportunities through ODFW's weekly fishing report.

2.5 Consider releasing smallmouth bass or other species in the lower Coast Fork Willamette.

Objective 3. Minimize impacts of new species of warmwater game fish on indigenous species.

Assumptions and Rationale

1. Warmwater game fish can compete with salmonids and other endemic fish species.

2. Releases of new species of warmwater fish will be evaluated through the ODFW Stocking Policy Review Process.

Actions

3.1 Discourage illegal introductions of warmwater game fish by anglers about the possible negative consequences.

OREGON CHUB

Background and Status

Origin

The Oregon chub is a small minnow historically recorded only from the Willamette and Umpqua basins in Oregon. The Willamette Population is now considered to be genetically discrete from the Umpqua population, which will most likely be classified as separate species (Markle et al. 1990).

Oregon chub were introduced into Dorena Pond in August 1990. The pond contains brown bullhead, bluegill and largemouth bass and is therefore not considered an ideal site. It is too early to know if this population will persist.

Life History and Population Characteristics

Main stem meanders and oxbows, stable backwater sloughs, marches, and beaver ponds offer the best habitat for Oregon chub. They prefer shallow water with little to no velocity, summer water temperatures exceeding 64°F and depositional substrate with abundant aquatic vegetation (Markle et al. 1990).

Much of what we know about the biology of the Oregon chub was documented by Pearsons (1989). He found spawning to occur in aquatic vegetation during spring to early summer. Sexual maturity was evident in individuals by the time they reached 1.4 inches while the largest specimen collected was less than 3 inches. Fecundity ranged from 147 to 671 eggs per female. Oregon chub were characterized as opportunistic feeders with food consisting mostly of zooplankton but supplemented by chironomids, mayflies, and other small aquatic invertebrates.

Management Considerations

The decline of the Oregon chub in the Willamette system correlates with the construction of dams and flood control projects in the Willamette Valley. Historically, the main stem Willamette had a braided channel with numerous secondary side channels and wetlands. During winter and spring flooding, Oregon chub dispersed in the flood plain to pond and slough habitats where spawning and juvenile rearing occurred. With flood control projects, channelization of the Willamette River and loss of backwaters, sloughs, and ponds, available habitat for Oregon chub was greatly reduced.

Oregon chub may also be vulnerable to predation by introduced warmwater fish species. Warmwater fish are often the dominant inhabitants of quiet waters along the Willamette River. They are probably a major detriment to recolonization, if not a cause of the decline of the Oregon chub.

The Oregon Department of Fish and Wildlife lists the Oregon chub as a sensitive species due to declines in numbers and suitable habitat. Oregon chub is on the federal register as a category 2 species. A petition to list the Oregon chub on the federal register as endangered has been submitted by Markle and Pearsons (1990) in light of decreased and restricted distribution.

An interagency task force representing ODFW, USACE, USFS, USFWS and Oregon State University has been formed to coordinate management of Oregon chub in the Willamette basin. The task force has drafted a conservation agreement for Oregon chub which is the basis of the objectives and actions for Oregon chub in this plan.

The Coast Fork Willamette subbasin is considered likely to have undocumented Oregon chub populations. Finding undocumented populations and establishing new populations have been given a high priority in this plan. Management of Oregon chub in the subbasin will be compatible with the Wild Fish Management Policy.

Objectives

Objective 1. Protect existing populations.

Assumptions and Rationale

1. Undocumented populations of Oregon chub may exist in the Coast Fork subbasin.

Actions

1.1 Continue efforts to locate populations of Oregon chub.

Objective 2. Establish new populations.

Assumptions and Rationale

1. Habitat for Oregon chub probably exists within the subbasin. Further investigation may identify potential sites.

Actions

2.1 Release Oregon chub in appropriate sites following guidelines in the Conservation Agreement for Oregon Chub (ODFW et al. 1990).

2.2 Monitor introduced populations.

Objective 3. Increase public understanding of the status of Oregon chub and the factors that influence abundance.

Assumptions and Rationale

1. The status and importance of the Oregon chub is recognized by only a small portion of the general public.

Actions

3.1 Publicize efforts taken to protect and enhance populations of Oregon chub.

3.2 Educate anglers about the status of the Oregon chub and the risks of introducing exotic species.

ANGLER ACCESS

Background and Status

The state land board classifies the Coast Fork Willamette River as "navigable" from RM 23 to RM 45 (DSL 1983). This classification if based on the historical use of the river for log drives. Stream banks of waters designated as navigable are publicly owned up to the ordinary high water mark. Unless lands above the ordinary high water mark are publicly owned or access is granted by private owners, access can be restricted to boaters only. Much of the stream bank along the lower reaches of the system is privately owned. The Willamette Greenway does provide some access for bank anglers and several launch sites for boaters from Cottage Grove Dam to the mouth. BLM, USACE and USFS land provide good access to much of the upper reaches.

Policies

Policy 1. The Department shall seek to provide public angling access to allow use of fish populations, provide a diversity of angling opportunities, and disperse angling effort.

Objectives

Objective 1. Increase access to public waters for angling.

Assumptions and Rationale

1. No access needs were listed by ODFW (1990) for the Coast Fork Willamette subbasin.

2. Angling opportunities on the Row River below Dorena Dam are reduced by low flows.

3. Angling access needs could change as angling pressure changes.

Actions

1.1 Cooperate with the USACE to determine flows that improve opportunities for angling below Dorena Dam.

1.2 Periodically review access needs.

PLAN ADOPTION AND REVIEW

This plan is intended to provide both long term and short term direction for management of fish and fisheries in the Coast Fork Willamette subbasin. It should not be viewed as the final statement on the management of the fish and fisheries in the Coast Fork Willamette subbasin. The plan will respond to changes in condition of the resources, desires of the public and to new information. A public meeting will be held every two years to review progress towards meeting objectives and to allow input on modifications to the priorities and actions identified in the plan. This review will precede submitting the Department's biennial budget to the legislature.

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. Every 5 years, the entire plan will be reviewed, revised and the changes in administrative rules presented to the Fish and Wildlife Commission for adoption.

PRIORITY OF ACTIONS

The following are considered the highest priorities in the Coast Fork Willamette subbasin:

-- Protect fish populations from impacts caused by land use activities.

-- Protect and enhance the productivity of wild cutthroat and rainbow trout.

-- Locate populations of Oregon chub.

-- Provide additional angling opportunities for warmwater game fish while protecting native species.

-- Maintain public access.

The Coast Fork Willamette Subbasin Fish Management Plan lists many activities, more than can be completed within existing budgets. Some activities are currently on-going and only need to be continued or modified. Other activities are new and need funding before they can be implemented. In order to achieve the objectives of this plan within the Department's budgetary and staff limitations, priorities for funds and effort must be identified.

High priority activities were identified for habitat, species and access (Table 19). A "yes" in the currently funded column denotes that at least some funding is budgeted under existing programs. If addition funds are needed, it is noted in the remarks column.

Table 19. High priority issues in the Coast Fork Willamette Subbasin Fish Management Plan and funding status.

Issues	Currently funded	Remarks
HABITAT		
Apply for in-stream water rights to ensure adequate flow for fish production. (Action 1.2)	Yes	
Prevent impacts of timber harvest on fish production. (Action 1.1)	Yes	
Review permit applications to prevent impacts from development on fish production. (Action 1.3)	Yes	
Enhance habitat for cutthroat and rainbow trout. (Action 2.2)	Yes	Additional funding needed
TROUT		
Determine distribution, abundance and life history of cutthroat trout. (Action 1.1)	Yes	Additional funding needed
WARMWATER		
Determine distribution and abundance of warmwater fish in the Coast Fork Willamette river below Dorena and Cottage Grove dams. (Action 1.1)	Yes	Additional funding needed
Develop a warmwater angling guide for the upper Willamette district. (Action 2.3)	Yes	
OREGON CHUB		
Search for populations of Oregon chub. (Action 1.1)	Yes	
ANGLING ACCESS		
Determine flows below Dorena Dam that improve angling. (Action 1.2)	Yes	

REFERENCES

Aho, R.S. 1977. A population study of the cutthroat trout in an unshaded section of stream. M.S. Thesis. Oregon State University, Corvallis.

Clady, M.D. 1971. The biology of the winter steelhead of the Willamette River, Oregon. Oregon State Game Commission, Portland.

Columbia Basin Fish and Wildlife Authority. 1990. Integrated system plan for salmon and steelhead production in the Columbia River Basin, Public review draft. Portland.

Dimick, R.E., and R. Merryfield. 1945. The fishes of the Willamette River system in relation to pollution. Engineering Experiment Station, Oregon State College, Corvallis.

Division of State Lands. 1983. Report and recommendation on the navigable waters of Oregon. Salem.

Franklin, J.F. and C.T. Dyrness. 1973. Natural vegetation of Oregon and Washington. General Technical Report PNW-8. U.S. Forest Service, Portland, OR.

Hansen, H.L. 1977. Stock assessment and enhancement of fall salmon species in the Willamette River system. Annual Progress Report. Oregon Department of Fish and Wildlife, Portland.

Hansen, H.L. 1978. Stock assessment and enhancement of fall salmon species in the Willamette River system. Annual Progress Report. Oregon Department of Fish and Wildlife, Portland.

Hansen, H.L., and R.H. Williams. 1979. Stock assessment and enhancement of fall salmon species in the Willamette River system. Annual Progress Report. Oregon Department of Fish and Wildlife, Portland.

Howell, P., K. Jones, D. Scarnecchia, L. LaVoy, W. Kendra, D. Ortmann. 1985. Stock assessment of Columbia River anadromous salmonids. Two volumes. Final Report to Bonneville Power Administration (Contract No. DE-AI79-84BP12737), Portland, OR.

Hunt, W.L. 1980. Wild trout inventory, 1980. Information Report 82-1. Northwest Region. Oregon Department of Fish and Wildlife, Portland.

Hutchison, J.M., K.E. Thompson, and J.D. Fortune, Jr. 1966a. The fish and wildlife resources of the upper Willamette basin, Oregon, and their water requirements. Oregon State Game Commission, Portland.

Hutchison, J.M., K.E. Thompson, and G.J. Hattan. 1966b. Number and distribution of steelhead trout spawning in the Willamette basin in 1966. Oregon State Game Commission, Portland.

Markle, D.F. and T.N. Pearsons. 1990. Petition to list the Oregon chub, *Oregonichthys crameri*, as an endangered species. Manuscript. Oregon State University, Corvallis, Oregon.

Markle, D.F., T.N. Pearsons and D.T. Bills. 1990. Natural history of *Oregonichthys* (Pisces: Cyprinidae) with a description of a new species from the Umpqua River of Oregon. Copeia in press.

Mattson, C.R. 1948. Spawning ground studies of Willamette River spring chinook salmon. Fish Commission of Oregon Research Briefs 1(2):21-32.

Moring, J.R., and R.L. Youker. 1979. Oregon rainbow and cutthroat trout evaluation. Final report. Oregon Department of Fish and Wildlife, Portland.

Nicholas, J.W. 1978A. A review of the literature and unpublished information on cutthroat trout (*Salmo clarki clarki*) of the Willamette watershed. Information Report 78-1. Oregon Department of Fish and Wildlife, Portland.

Oregon Department of Fish and Wildlife. 1980. Enhancement of salmon and steelhead in the Willamette River system. Quarterly progress report. Fish Division, Portland.

Oregon Department of Fish and Wildlife. 1987a. Oregon's trout plan. Fish Division, Portland.

Oregon Department of Fish and Wildlife. 1987b. Warmwater game fish management plan. Fish Division, Portland.

Oregon Department of Fish and Wildlife. 1988. Willamette basin fish management plan. Portland.

Oregon Department of Fish and Wildlife. 1989. Oregon salmon and steelhead catch data, 1975-86. Fish Division, Portland.

Oregon Department of Fish and Wildlife. 1990a. Wild fish policy. Fish Division, Portland. Draft.

Oregon Department of Fish and Wildlife. 1990b. Oregon angling access database. Fish Division, Portland.

Oregon Department of Fish and Wildlife, Oregon State University Fisheries and Wildlife Department, and Willamette National Forest. 1990. Conservation agreement for the Oregon chub in the Willamette Valley, Oregon. Draft report.

Sedell, J.R. and J.L. Froggatt. 1984. Importance of streamside forests to large rivers: the isolation of the Willamette River, Oregon USA, from its floodplain by snagging and streamside forest removal. Internationale Vereinigung fuer Theoretische und Angewandte Limnologie Verhandlungen 22: 1828-1834.

Smith, M. 1976. Rearing spring chinook salmon in Willamette River reservoirs. Closing report, Oregon Department of Fish and Wildlife, Portland.

Smith, E.M., R.H. Williams, and J.C. Zakel. 1982. Willamette River salmon studies. Annual progress report. Oregon Department of Fish and Wildlife, Portland.

Smith, E.M., R.H. Williams, and J.C. Zakel. 1983. Willamette River salmon studies. Annual progress report, Oregon Department of Fish and Wildlife, Portland.

Smith, E.M., J.C. Zakel, and W.H. Day. 1985. Willamette River salmon studies. Annual progress report. Oregon Department of Fish and Wildlife, Portland.

State Water Resources Board. 1961. Upper Willamette River Basin. Salem, OR.

U.S. Army Corps of Engineers. 1982. Willamette River projects, hydrologic and temperature effects, preliminary literature review and data analysis. Portland, OR.

U.S. Forest Service. 1987a. Draft environmental impact statement, proposed land and resource management plan, Willamette National Forest. Pacific Northwest Region, Portland, OR.

U.S. Forest Service. 1987b. Draft environmental impact statement, proposed land and resource management plan, Umpqua National Forest. Pacific Northwest Region. Portland, OR.

Water Resources Department of Oregon. 1985. Upper Willamette River Basin. Before the Water Policy Review Board, Salem.

Willamette Basin Task Force. 1969. The Willamette Basin, comprehensive study of water and related land resources. Pacific Northwest Rivers Basin Commission.

Williams, R. 1983a. Releases of coho salmon into the upper Willamette River, Oregon. Research and development section, Oregon Department of Fish and Wildlife, Corvallis.

Williams, R. 1983b. Coho salmon in the upper Willamette River: a history of establishing a run of non-indigenous salmon and prospects for renewed efforts to increase the run. Oregon Department of Fish and Wildlife, Portland. Draft.

Willis, R.A., M.D. Collins, and R.A. Sams. 1960. Environmental survey report pertaining to salmon and steelhead in certain rivers of eastern Oregon and the Willamette River and its tributaries, Part II. Survey reports of the Willamette River and its tributaries. Research division, Fish Commission of Oregon, Clackamas.

Wyatt, B. 1959. Observations on the movements and reproduction of the Cascade form of cutthroat trout. M.S. Thesis. Oregon State College, Corvallis.