LONG TOM SUBBASIN

Fish Management Plan

Oregon Department of Fish & Wildlife

LONG TOM SUBBASIN FISH MANAGEMENT PLAN

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INTRODUCTION

A high priority of the Willamette Basin Fish Management Plan (ODFW 1988) was the preparation of plans for subbasins within the Willamette basin. The Long Tom Subbasin Plan was developed to provide specific direction for management of the fish resources of the Long Tom subbasin. The scope of the plan includes the Long Tom River and its tributaries. A separate mini-plan will be written for Fern Ridge Reservoir.

ODFW is committed to the planning process as an integral part of all current and future management by the agency. The Long Tom Plan is one element of the Department's planning efforts. Species plan for coho, steelhead, coastal chinook salmon trout and warmwater game fish have been adopted. These statewide plans guide the development of more localized plans for individual river basins and subbasins.

These plans serve several needed functions. They present a logical, systematic approach to conserving our aquatic resources. They establish management priorities and direct attention to the most critical problems affecting our fisheries so that the Department's funds and personnel can be used accordingly. They inform the public and other agencies about the Department's management programs and provide them with the opportunity to help formulate those programs.

The Long Tom Subbasin Plan was developed by the Oregon Department of Fish and Wildlife with the assistance of a public advisory committee and a technical advisory committee. The public advisory committee represented user groups and interested members of the community at large. The function of this committee was to help identify objectives and actions and to serve as a sounding board for public interests. The public advisory committee members were:

Bob Bumstead
Dan Craft
Wes Hare
Rod Hatter
Glen Hills
Mark Hoy
Richard Johnson
Bill Laing
Michael Marczuk
Lynn Moore
Greg Pitts
Don Wouda

The technical advisory committee was composed of representatives of federal and state fishery and land management agencies. This committee contributed information used in the plan and reviewed drafts of the plan. Members of this committee were:

Member	Affiliation
Thom Lanfear	Lane County Land Management Division
Bill Chapman	Lane County Parks
Neil Armantrout	Bureau of Land Management
Bob Walters	Bureau of Land Management

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

The plan is divided into sections that deal with habitat, the major fish species or groups of species, and angling access. Each of these sections contains:

1. Background and Status--historical and current information on the topic of that section that helps explain the context of the policies, objectives, and actions that follow.

2. Policies--constraints or principles developed specifically for management activities in the subbasin related to that species or topic.

3. Objectives--what is intended to be accomplished.

4. Actions--solutions or methods for accomplishing the objectives.

GENERAL CONSTRAINTS

Besides the statewide species plans and the Willamette Plan, the Long Tom 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 Department of Environmental Quality (DEQ) has developed state water quality standards that are in compliance with federal water quality standards. State water quality standards are specifically directed at fish bearing waters. DEQ administrative rules (Chapter 340, Division 41) address water quality standards basin by basin.

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

House Bill 2990 of 1985 (codified in part as ORS 543.015 and ORS 543.017) provides strict standards to protect anadromous fish, resident game fish and recreation from adverse effects of hydroelectric development. Its general impact has been to halt hydro development on anadromous fish streams.

The Oregon Revised Statutes (ORS) require fish ladders and fish screens at dams and water diversions to provide upstream and downstream fish passage.

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 Forestry. 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 has 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).

County land use plans contain goals and policies for riparian protection, erosion prevention, and fish and wildlife habitat protection.

Procedures Developed by ODFW

A Department Guide for Introductions and Transfers of Finfish into Oregon Waters (1982) and Fish Disease Control Guidelines (1979) provide direction for management of fish.

Agreements with Other Agencies

Each of the land and water management agencies in the Long Tom subbasin 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), and the U.S. Army Corps of Engineers (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 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. The BLM has initiated its planning process for western Oregon. Projected date of completion is late 1990. BLM fish habitat improvement projects require close coordination with the Department of Fish and Wildlife's Salmon and Trout Enhancement Program (STEP).

ODFW and the state Water Resources Department (WRD) have a memorandum of understanding

to coordinate review and action on water rights applications that conflict with protection of fish and wildlife habitats (Memorandum of Understanding, Oregon Department of Fish and Wildlife - Oregon Water Resources Department 1990). WRD is currently updating its management programs for the Willamette Basin. Programs affect future water rights, set priorities for water use, and prescribe actions to solve water problems. ODFW, along with other state natural resource agencies, has identified issues that ODFW will cover and contribute to the Water Resources Department's planning process. Final adoption of new programs is expected in 1991. Water rights have not been adjudicated in the Long Tom subbasin.

The Governor's Watershed Enhancement Board provides an opportunity for private individuals as well as organizations to become involved in watershed rehabilitation projects. An Oregon Fish and Wildlife Commission member is a member of this board.

General Policies

The following general policies apply to all subbasin plans in the Willamette basin, including the Long Tom 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 that 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 Long Tom subbasin has about 350 miles of perennial streams (Willamette Basin Task Force 1969) that drain 410 square miles of Lane and Benton counties. The Long Tom River originates in the Coast Range Mountains and travels 55 miles before entering the Willamette River at RM 149 (Fig. 1). Its largest tributary, Coyote Creek, enters at RM 27, an area inundated by Fern Ridge Reservoir.

Flows mimic seasonal precipitation, but are affected by water releases from Fern Ridge Dam (Table 1). Average monthly flows near the mouth range from 40 cfs in July to 1,980 cfs in December and average about 700 cfs (U.S. Geological Survey, unpublished).

Stream temperatures is the lower subbasin commonly exceed 70^{o} F in the summer (Table 2). The Long Tom River between Fern Ridge Dam and its mouth can exceed 80^{o} F (Willamette Basin Task Force 1969). High water temperatures severely limit production of salmonids and favor warmwater game fish. Resident cutthroat trout appear not as affected by the warmer water temperatures as other salmonids. Excessive sedimentation is also a problem in many of the low gradient stream reaches.

A small portion of the subbasin drains the geologically older deposits of the Coast Range Mountains, but most of the subbasin courses the recent alluvial deposits of the Willamette Valley. About 95 percent of the subbasin is below 1,000 feet with the highest point at 2,100 feet and the lowest point at 248 feet. Gradients of streams are moderate to low. The headwaters and tributaries of the upper subbasin have higher gradients as they flow through the steeper slopes of the Coast Range (Fig. 2), but the topography quickly flattens. Low gradient reaches typically have mud and silt substrates with limited spawning gravels (Willis et al. 1960).

Upland vegetation varies markedly with elevation and topography. The higher elevation and steeper sloped areas are covered with conifers (Douglas fir, western hemlock and western red cedar). Hardwood stands are more prevalent in lower elevations. Vegetation on the valley floor has been highly modified to agricultural crops.

Riparian overstory vegetation consists of cottonwood, red alder and bigleaf maple. Some riparian zones have been cleared by logging and agriculture uses. Long stretches of the main stem Long Tom have been channelized and rip-rapped.

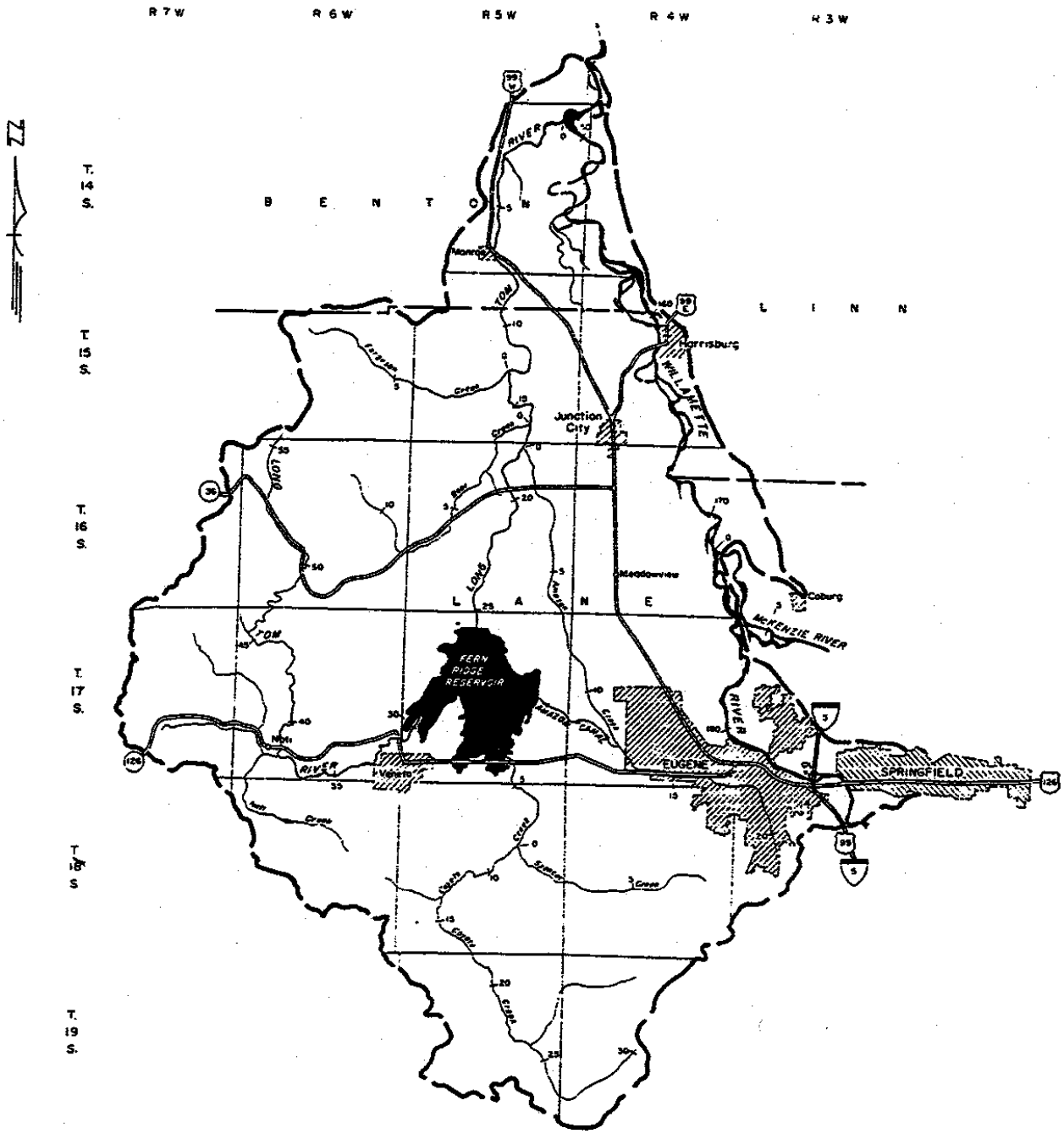


Figure 1. The Long Tom subbasin (Willamette Basin Task Force 1969).

Table 1. Monthly and annual discharges at six locations in the Long Tom subbasin (USGS, unpublished data).

Station	Mean discharge (cfs)													Years of record
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
Long Tom at Monroe, OR	1,300	1,404	707	534	243	96	39	48	75	870	1,043	1,977	692	1977-86
Long Tom at Alvadore, OR	831	707	339	350	161	78	55	67	79	846	865	1,498	474	1977-85
Long Tom below Fern Ridge Dam	831	801	343	294	140	69	48	61	72	841	795	1,348	469	1977-86
Long Tom at Noti, OR	365	512	334	247	123	68	31	15	21	36	205	495	203	1977-86
Coyote Creek near Crow, OR	296	438	237	180	68	18	4	<1	2	6	153	448	153	1977-86
Amazon Creek at Eugene, OR	18	8	9	4	2	<1	<1	<1	<1	<1	6	14	5	1963-75

Table 2. Water quality characteristics of the Long Tom at its mouth (DEQ, unpublished data).

Characteristic	Seasonal[a] mean values			
	Winter	Spring	Summer	Fall
Ph	7.3	7.7	7.6	7.3
Temperature (°F)	46.4	64.5	72.7	49.9
Dissolved Oxygen (mg/l)	11.8	10.8	8.8	11.2
Turbidity (FTU)	30.5	11.1	10.9	27.2

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

Infrequent major storms can cause massive erosion or slides of the unstable clay soils of the upper subbasin and effect water quality for long periods of time (Lane Council of Governments 1983). All tributaries above Fern Ridge Reservoir have low levels of conductance, alkalinity, and chloride (Table 3). None of the mean values for nitrogen or phosphorous exceed state guidelines, but the levels for Amazon and Coyote creeks were close and sometimes exceeded guidelines on individual days (Lane Council of Governments 1983). Fecal coliform levels and turbidity can be excessive in Amazon and Coyote creeks.

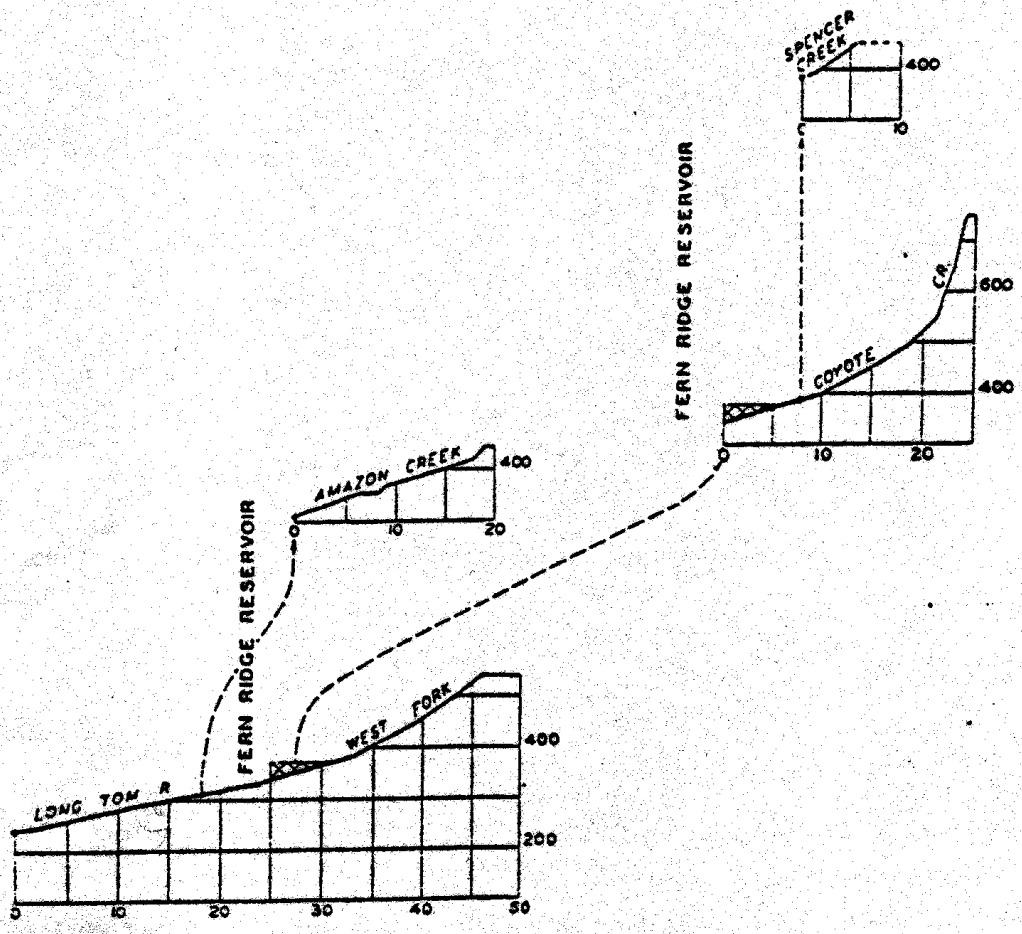
Table 3. Water quality data for the Long Tom subbasin above Fern Ridge Dam (Lane Council of Governments 1983).

Parameter	Units	Amazon Channel		Coyote Creek		Long Tom R.	
		Mean	Median	Mean	Median	Mean	Median
Flow	cfs	45.1	18.0	421	170	495	280
Temperature	°C	12.8	11.3	12.7	11.3	11.9	11.5
pH	su	7.2	7.2	7.0	7.0	6.9	6.8
Conductance	umho	140	123	100	78	44	38
Secchi	in	16.9	14.2	15.1	16.0	28.8	29.0
Turbidity	NTU	23.3	24.5	28.1[b]	22.0	9.9	6.9
Tot Coll	#/ml	18.2[b]	14.0[b]	33.3[b]	28.0[b]	3.5[b]	2.7[b]
Fecal Coll	#/ml	6.3[b]	4.0[b]	22.4[b]	12.4[b]	1.2	0.8
Total Res.	mg/l	142.2[b]	140.8[b]	107.9[b]	106.0[b]	62.4	59.0
Non Fil Res	mg/l	28.9[b]	24.0[b]	29.6[b]	34.5[b]	20.9	22.0
Nitrogen	mg/l	.14	.14	.08	.07	.20	.17
Ammonia	mg/l	.02	.02	.04	.02	.02	.01
Phos Total	mg/l	.10	.09	.10	.10	.05	.05
Phos-Ortho	mg/l	.04	.04	.04	.04	.02	.01
Alkalinity	mg/l	48.6	42.6	26.4	24.3	13.5	12.5
Hardness	mg/l	54.6	46.6	29.7	28.8	11.9	11.1
Chloride	mg/l	10.4	9.0	9.6	6.8	3.7	3.5
DO	mg/l	8.3	0.6	8.9	9.6	9.5	9.5
BOD	mg/l	4.4	4.3	4.6	4.9	2.7	2.3
COD	mg/l	20.5	19.3	12.1	11.4	8.3	7.8
Iron	mg/l	903	885	1,166	1,030	814	805
Lead	mg/l	7.4	5.5	14.2	1.0	0.8	1.0

[a] Excludes one sample (9-29-81) with extreme pollutant values which greatly skew results.

[b] Value exceeds state standards or guidelines.

Figure 2. Profiles of stream gradients in the Long Tom subbasin.



Land Use

Most (91 percent) of the land in the Long Tom subbasin is privately owned. BLM and USACE are the major federal landowners. Forestry and agriculture are the primary land uses (Table 4).

Table 4. Land use distribution in the Long Tom subbasin above Fern Ridge Dam (Lane Council of Governments 1983).

Tributary		USACE	Urban	Rural	Agric.	Forest	Total
Long Tom River	Sq. mi.	0.5	1.1	2.6	12.7	91.1	108
	%	0.5	1.0	2.4	11.8	84.4	39.3
Coyote Creek	Sq. mi.	1.0	0.7	6.6	36.9	61.8	107
	%	0.95	0.65	6.2	34.5	57.7	38.9
Amazon Diversion Channel	Sq. mi.	0.1	12.4	3.4	5.9	2.2	24
	%	0.5	51.6	14.3	24.5	9.1	13.1
Direct drainages	Sq. mi.	2.2	1.0	10.3	12.4	10.1	36
	%	6.2	2.8	28.5	34.5	28.0	13.1
Total basin	Sq. mi.	3.8	15.2	22.9	67.9	165.2	275
	%	1.4	5.5	8.3	24.7	60.1	100

About 50% of the watershed is forested with commercial forests generally restricted to the upper reaches of the watershed. Most of the forested lands in the Long Tom subbasin have 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 has cause relatively minor increases in sedimentation and siltation of streams in the Long Tom subbasin (Lane Council of Governments 1983).

About 40% of the subbasin is suitable for agriculture (SWRB 1961). The majority of cultivated lands extend from the mouth of the subbasin up to and surrounding Fern Ridge Reservoir. Above the reservoir, agriculture is limited to the narrow valley floors of the Long Tom and its larger tributaries. Negative effects of agriculture on fish production have been pervasive. Water quality has been severely impacted as a result of excessive water withdrawals and sediment yields. Livestock wastes and other agricultural by-products have caused recurring water quality problems in Coyote Creek (Lane Council of Governments 1983). Substantial decrease and modification of fish habitat has occurred on the Long Tom River as a result of channelization related to agriculture. Essentially the entire length of the Long Tom from its mouth to Fern Ridge Dam has been modified (G. McGinnis, WRD, personal communication).

The western portion of Eugene is drained by Amazon Creek. Small communities in subbasin include Veneta, Monroe and Junction City. Rural residential structures are prevalent. Pollutants from development along Amazon Creek and storm drain runoff have adversely effected fish production.

Fern Ridge Dam on the Long Tom River was completed in 1941 and is operated by the Army Corps of Engineers for flood control, irrigation and navigation. It also provides water for recreation, in-stream flows, and pollution abatement. No fish passage facilities were provided since anadromous salmonids were considered absent (USACE 1982). However, cutthroat trout that migrate between the Long Tom and Willamette rivers were blocked.

A significant portion of the Long Tom River is allocated for out-of-stream uses (Table 5) and much of the flow is diverted, primarily for irrigation (Table 6). This created low flow problems throughout much of the subbasin. A minimum streamflow of 0 from natural flows and 370 cfs from storage has been established for the Long Tom River below Fern Ridge Dam. This flow is to be provided by releases from Fern Ridge Dam. This flow is not always been met, especially during drought periods (USACE 1980).

Table 5. Water rights by category in the Long Tom subbasin (WRD, unpublished data).

Stream	Agriculture	Industrial	Municipal	Domestic	Recreation	Total
Long Tom R.						
cfs[a]	324.1	0	0	0.1	0	324.0
acf[b]	3,312.0	0	0	0	0	3,313.0
Ferguson Creek						
cfs	6.9	0	0	<0.1	0	6.8
acf	0	0	0	0	0	0
Bear Creek						
cfs	37.8	0.1	0	<0.1	<0.1	36.9
acf	0	0	0	0	0	0
Amazon Creek						
cfs	14.9	0	0	0	0	14.9
acf	0	0	0	0	0	0
Amazon Canal						
cfs	0.1	0	0	0	0	0.1
acf	0	0	0	0	0	0
Coyote Creek						
cfs	17.9	0	0	0	0	17.9
acf	38.1	0	0	0	5.0	43.1
Fern Ridge Res.						
cfs	1.1	0	0	0	0	1.1
acf	1,662.8	0	0	0	0	1,662.8
Indian Creek						
cfs	22.9	0	0	0	0	22.9
acf	2,180.4	0	0	0	0	2,180.4
Noti Creek						
cfs	43.0	0	0.2	0.7	0	44.0
acf	0	0	0	0	0	0
Other						
cfs	12.2	0	0	<0.1	0.1	12.4
acf	158.0	0	0	0	0	158.0
Total						
cfs	479.9	0.1	0.2	0.9	0.1	481.2
acf	7,353.3	0	0	0	5.0	7,358.3

[a] cfs = cubic feet per second.

[b] acf = acre feet.

Table 6. Surface water withdrawals by use category in the Long Tom subbasin (USGS, unpublished data).

Use	Quantity (cfs)
Public supply	16.1
Domestic	2.2
Commercial	<0.1
Irrigation	42.9
Livestock	1.5
Industrial	44.3
Mining	<0.1
Total	107.0

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 the 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 naturally reproducing 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. Some streams in the Long Tom subbasin are over-appropriated for out-of-stream use.

4. In-stream water rights and other 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.

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 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 Promote the STEP storm drain marking and education programs to reduce pollutants entering Amazon creek.

1.5 Ensure minimum flows are released from Fern Ridge Dam.

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

1.7 Ensure that all diversions are properly screened and maintained.

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

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 Improve passage and encourage routine maintenance at the dam on the Long Tom River at Monroe (RM 7).

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

COHO SALMON

Background and Status

Origin

Coho are not native to the Willamette River above Willamette Falls. In the 1960s coho were widely introduced above the falls including the Long Tom River (Williams 1983). Today, coho are considered absent from the Long Tom subbasin.

Hatchery Production

Early-run Toutle stock yearlings and coastal stock fry were intermittently released from 1967 through 1972 to establish a self-sustaining population (Table 7). Successful natural spawning of coho was documented (Howell et al. 1985), but adult returns were never numerous.

Table 7. Hatchery releases of coho in the Long Tom subbasin (Williams 1983).

Year	Hatchery	Stock	Number of fish		Release location
			Fry	Smolts	
1967	Nehalem	Coastal	26,700		Booker Creek
			12,500		Elk Creek
			15,700		Hayes Creek
			103,600		Long Tom River
1970	Sandy	Toutle		16,330	Ferguson Creek
1971	Cascade	Toutle		17,600	Ferguson Creek
1972	Cascade	Toutle		14,550	Ferguson Creek

Angling and Harvest

No coho were caught from 1975 through 1987 (ODFW 1989). The Long Tom subbasin has been closed to salmon angling since 1980.

Management Considerations

Coho are not native to the Long Tom subbasin. The failure of introduced hatchery fish to establish self-sustaining runs in areas below Fern Ridge Dam has been largely attributed to the high rates of harvest in the ocean and lower Columbia River fisheries (Smith et al. 1983) and low flows in the summer and fall that limit spawning and juvenile production (Howell 1986). Most of the subbasin is not accessible to anadromous fish because Fern Ridge Dam has no fish passage facilities. There are also several smaller dams downstream that hinder passage. Introducing a "late run" stock such as Cowlitz may establish some natural production, unfortunately these fish migrate north in the Pacific Ocean and do not contribute well to Oregon fisheries. Production of native cutthroat trout would be expected to be reduced if coho were introduced.

Policies

Policy 1. Coho salmon shall not be released into the Long Tom subbasin.

TROUT

Background and Status

Origin

Native cutthroat trout are found at least seasonally in almost all streams supporting fish. Fern Ridge Dam and potentially two other artificial barriers between Fern Ridge Dam and Monroe isolate segments of the population. Downstream migration over these barriers is possible which allows a one-way exchange of genetic material between populations.

The provisional inventory of stocks for the Wild Fish Policy lists one stock of cutthroat trout above Fern Ridge Dam and the fish below it as part of the main stem Willamette group.

Life History and Population Characteristics

Density of resident cutthroat trout has not been systematically assessed. Cutthroat trout are relatively numerous in most smaller tributaries (ODFW, unpublished data). Younger cutthroat trout appear to be absent from the Long Tom below Fern Ridge Dam (Ely 1980; ODFW, unpublished survey in 1979) and larger adults appear only seasonally.

Age structure of cutthroat trout in small tributary streams in the Willamette system has often been found to differ from that of cutthroat trout in lower stream reaches (Moring and Youker 1979). A sample of 21 cutthroat trout in the lower Long Tom River were all 2 or 3 years old. These age structure data indicate that cutthroat trout populations in lower reaches of streams of the Long Tom subbasin may rely heavily upon production in smaller tributaries for recruitment (Moring and Youker 1979). These fish ranged from 6.5 to 10.4 inches fork length at age 2 and between 6.2 and 12.0 at age 3 (Moring and Youker 1979). These lengths are within the range of lengths recorded for other streams of the Willamette Valley.

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).

Cutthroat trout were collected from the Long Tom below Fern Ridge Dam in 1967-68 and held at Leaburg Hatchery (Moring and Hooton 1978). Hatchery propagated females averaged 11.8 inches with 500-700 eggs at age III and 16.1 inches with 1,300 eggs at age IV. The stock was discontinued in 1991.

Cutthroat move out of Fern Ridge Reservoir up the Long Tom in late July or early August (Moring and Youker 1979). This movement could be caused by the water warming in the reservoir.

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).

Cutthroat trout from the Long Tom subbasin have been noted for their unusual ability to survive in warm water (Hutchison et al. 1966) and their unusual silvery, "sea-run" coloration (Moring and Youker 1979).

Hatchery Production

Annual releases of hatchery rainbow trout in the Long Tom subbasin were terminated in the early 1960s (Table 8.) A release of 300 fish was made in 1970. No legal-size rainbow trout have been released since 1970. The only releases of hatchery cutthroat trout from 1955 to present are Long Tom stock fry in Coyote Creek in 1987 and 1988 by STEP volunteers.

Table 8. Releases of legal-size rainbow trout in the Long Tom River, 1955-70.

Year	Number released
1955	1,740
1956	1,501
1957	2,001
1958	5,007
1959	4,000
1960	3,998
1961	3,999
1962	4,013
1963	3,930
1964	0
1965	0
1966	0
1967	0
1968	0
1969	0
1970	300

Angling and Harvest

Estimates of angler use and catch rate in the subbasin are not well substantiated. Therefore, estimates of total harvest of wild trout are impossible to make with any confidence.

Management Considerations

Natural production of native cutthroat in most small streams of the upper reaches of the Long Tom subbasin provide low intensity self-sustaining fisheries. These small streams also serve as spawning and rearing areas for potamodromous cutthroat that migrate to larger streams and Fern Ridge Reservoir. Few hatchery produced trout have been released since the 1960s. Channelization, removal of riparian vegetation, urban and agricultural runoff, and excessive sediment loads have degraded some streams and, consequently, their cutthroat trout populations have been reduced or eliminated. Fern Ridge Dam and several smaller unladdered dams below it limit upstream migrations. Logging and road building near streams can create problems such as lack of shade, silt, debris accumulation and impassable road culverts.

ODFW considers Willamette cutthroat trout as stocks of concern because of suspected declines in abundance and habitat, but data are lacking. The plan for cutthroat trout presented below emphasizes increased monitoring of distribution and abundance, determining life history characteristics of the populations, protecting the habitat and enhancing habitat where applicable.

The provisional inventory of stocks for the Wild Fish Policy lists the cutthroat trout above Fern Ridge Dam as one stock and the fish below it as part of the main stem Willamette group. This undoubtedly will change as new information is collected on life history characteristics, migrations and barriers separating populations.

Policies

Policy 1. Cutthroat trout shall be managed for natural production of wild populations consistent with the Wild Fish Management Policy. No hatchery trout shall be released.

Objectives

Objective 1. Protect and enhance the productivity of wild cutthroat 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 trout will help identify habitat enhancement opportunities.

3. Willamette basin cutthroat trout are listed as a stock of concern due to insufficient information regarding their status. Cutthroat trout should be given a high priority with respect to population and habitat inventory and monitoring.

Actions

1.1 Monitor distribution and relative abundance of wild cutthroat trout.

1.2 Conduct life history studies of wild cutthroat trout.

1.3 Identify and implement habitat improvement opportunities for cutthroat.

Objective 2. Provide self-sustaining fisheries for cutthroat trout.

Assumptions and Rationale

1. The widely dispersed fisheries cutthroat trout under general regulations best fit the Basic Yield alternative of the Trout Plan.

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

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

4. Angling pressure is relatively light.

5. Current harvest levels are unknown.

Actions

2.1 Improve monitoring of angler effort, harvest, and catch rate.

WARMWATER GAME FISH

Background and Status

Origin

Streams in the Long Tom subbasin support populations of largemouth bass, white crappie, black crappie, bluegill, warmouth, brown bullhead, yellow bullhead and pumpkinseed sunfish. These species were introduced into the Willamette basin into the 1800s.

Life History and Population Characteristics

Largemouth bass, bullhead, bluegill, warmouth and crappie exist throughout the Long Tom River below Fern Ridge Dam, but information on the populations is sparse (Table 9). Warmwater game fish, especially crappie, flush from Fern Ridge Reservoir and contribute to populations downstream.

Table 9. Survey data for warmwater game fish in the Long Tom River (ODFW, unpublished data).

Site	Date	Number Species[a]	Size collected	range (cm)
RM 2.5	8/79[b]	LB	2	4.0-18.6
		WC	2	4.4-5.6
		BC	3	4.1-4.4
		Bg	5	2.7-4.5
		Wm	1	3.0
RM 3.1	8/79[c]	YB	4	7.1-12.3
RM 3.5	8/79[b]	LB	2	4.7-4.8
		Bg	4	2.4-3.0
RM 3.7	8/79[b]	LB	1	1.4
		Bg	6	2.0-4.2
		Wm	13	2.1-4.3
		BrB	4	7.9-8.9
		YB	1	6.8
RM 4	8/79[b]	LB	2	13.1-13.9
		Bg	8	2.9-4.5
RM 4.7	8/79[d]	BC	1	4.0
		BrB	1	11.4
		YB	8	4.4-8.7
RM 7.1	8/79[d]	WC	52	4.6-9.1
		BC	1	6.9
		Bg	2	5.0-5.8
		YB	7	5.6-10.4

(continued)

Table 9. Continued.

Site	Date	Number Species[a]	Size collected	range (cm)
RM 16	8/79[b]	LB	1	8.7
		WC	37	3.2-5.8
		BC	6	2.8-4.5
		Bg	9	2.2-5.6
		BrB	2	7.2-7.3
		YB	1	6.3
RM 16.5	8/79[b]	WC	16	3.3-5.2
		Bg	2	2.4-2.5
	8/79[d]	WC	15	4.5-5.5
		Wm	1	4.1
		YB	11	5.8-10.7
RM 18	8/79[b]	LB	1	5.0
		WC	17	3.2-6.0
		Bg	7	1.9-4.1
		Wm	4	2.5-4.3
		BrB	2	4.3-5.7
	8/79[d]	LB	1	4.8
		WC	16	4.6-9.1
		BrB	2	8.7-9.1
		YB	1	5.2
	8/79[d]	WC	20	4.6-5.7
		Bg	7	4.8-5.7
		YB	9	5.4-12.0
RM 25	8/79[b]	LB	78	3.9-10.7
		WC	26	4.6-8.4
		Bg	5	4.3-5.0
		BrB	1	5.7
RM 37	8/78[e]	None	--	--
Owens Creek	8/78[d]	None	--	--
Ferguson Creek	8/78[d]	None	--	--
Sturtevant Creek	8/78[d]	None	--	--

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

[b] Collected by boat electroshocker.

[c] Collected by setline.

[d] Collected by gillnet.

[e] Collected by backpack electroshocker.

Specific data on the life history characteristics of warmwater game fish in the Long Tom 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.

Hatchery Production

Warmwater game fish populations in the Long Tom subbasin are maintained by natural production.

Angling and Harvest

Creel checks have been spotty, but show the bulk of the angler activity for warmwater fish occurs on the Long Tom River below Fern Ridge Dam.

Management Considerations

The Long Tom River below Fern Ridge Reservoir provides a popular angling opportunity for a variety of warmwater species. Largemouth bass, bluegill, black crappie, white crappie and bullhead provide the majority of the catch. These populations are only lightly harvested and are limited by habitat. Channel catfish have been released and contributed to the catch, but they may no longer be present.

Policies

Policy 1. Any management proposals for warmwater game fish shall be reviewed and evaluated for potential effects on indigenous fish species.

Objectives

Objective 1. Protect and enhance existing warmwater game fish populations.

Assumptions and Rationale

1. Existing populations of largemouth bass, bluegill, black crappie, white crappie and bullhead will provide relatively stable, self-sustaining fisheries if habitat is protected, restored and enhanced.

Actions

1.1 Inventory distribution and abundance of all species of warmwater game fish in the Long Tom River below Fern Ridge Dam.

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

1.3 Identify and implement habitat improvement opportunities for largemouth bass, crappie and channel catfish.

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, especially crappie and largemouth bass would increase with better access and if the public were better informed of opportunities.

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

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 channel catfish or other species.

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 and may have a substantial impact on other endemic fauna.

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 educating angling clubs and other anglers about the possible negative consequences.

ANGLING ACCESS

Background and Status

The State Land Board classifies the Long Tom as navigable from its mouth to RM 11. Classification is based on historical use for log drives. Stream banks of waters designated as navigable are publicly owned up to the ordinary high water mark and can be used by the public for angling. 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. Nearly all of the stream banks in the Long Tom subbasin are privately owned. Public ownership is concentrated in the upper reaches of the system (BLM) and near Fern Ridge Reservoir.

Policies

Policy 1. The Department shall seek to provide public angling access to allow use of the 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. Three sites are listed by ODFW (1990) as needed for increasing public access: Cox Butte, Monroe, and Crocker's Bridge. These sites are privately owned and require acquisition and development. Although these sites are listed as a low priority relative to other sites statewide, the Cox Butte site probably should be a high priority in recognition of the high use of the Long Tom River by warmwater anglers and the lack of adequate public access in the area.

2. Angling opportunities on the Long Tom River below Fern Ridge Dam are reduced by water release schedules from the reservoir.

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

Actions

1.1 Acquire and develop an access site at Cox Butte as well as Monroe, and Crocker's Bridge.

1.2 Cooperate with the USACE to determine flows that improve opportunities for angling below Fern Ridge Dam.

1.3 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 Long Tom subbasin. It should not be viewed as the final statement on the management of the fish and fisheries in the Long Tom 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 ODFW'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 Long Tom subbasin:

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

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

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

-- Maintain public access and provide additional sites.

The Long Tom 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 ODFW's budgetary and staff limitations, priorities for fund and effort must be identified.

High priority activities were identified for habitat, species and access (Table 10). 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 10. High priority issues in the Long Tom Subbasin Fish Management Plan and funding status.

Issues	Currently Funded	Remarks
HABITAT		
Apply for in-stream water rights to ensure adequate flows 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 trout, largemouth bass and crappie (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 Long Tom River below Fern Ridge Dam (Action 1.1)	Yes	Additional funding needed
Develop a warmwater angling guide for the Upper Willamette District (Action 2.3)	Yes	
ANGLING ACCESS		
Acquire key sites on the Long Tom River below Fern Ridge Dam (Action 1.1)	Yes	Additional funding needed
Determine flows below Fern Ridge that improve angling (Action 1.2)	Yes	

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