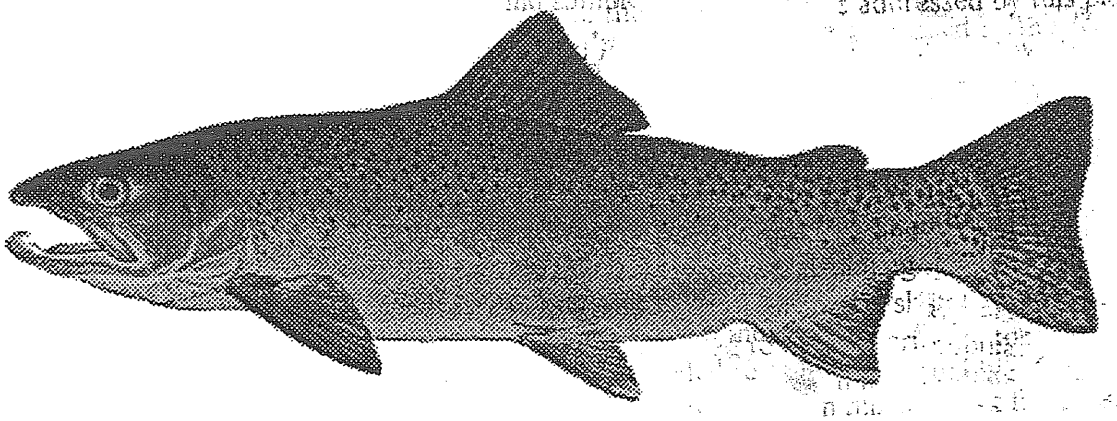
SILETZ RIVER BASIN
FISH MANAGEMENT PLAN



Oregon Department of Fish and Wildlife

November 1997

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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 Siletz River Basin Fish Management Plan (hereafter referred to as the Siletz Plan) was developed to direct management of the fish resources of the Siletz River Basin. The scope of the plan includes the mainstem Siletz River and its tributaries, including Schooner and Drift creeks, and publicly accessible lakes, ponds and reservoirs in the basin.

The Siletz Plan is one of several Oregon mid-coast basin plans developed by ODFW. Other plans have been developed for the Salmon River, Yaquina River, Alsea River, Yachats River, and Siuslaw River basins and for small ocean tributary streams along the mid-coast.

ODFW is committed to the planning process as an integral part of all current and future management by the agency. Species plans for coho, coastal chinook, steelhead, 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 Siletz Plan was jointly developed by ODFW staff and a public steering committee. The steering committee included individuals who represented federal land management agencies, state and local government, private land owners, and fishing and conservation groups. The function of this committee was to help identify management direction and strategies for fish resources in the Siletz River Basin. The steering committee helped develop management policies, objectives and actions, and reviewed drafts of the plan. Siletz River Basin Steering Committee members were:

Member	Affiliation
Jerry Buxton	*Oregon Salmon Commission*
Jack Dunaway	*Oregon Department of Forestry*
Bob Gebhart	*Oregon Salmon Commission*
Thomas Gilg	*Mid-Willamette Fly Fishers*
Don Gonzales	*Siuslaw National Forest*
Ed Gory	*Landowner*
Bill Lackner	*Game Birds Unlimited*
Dick Patton	*Georgia-Pacific, Inc.*
Doug Pudwill	*River Guide*
Blanchard Smith	*Oceanside Properties*
Jim Stafford	*NW Steelheaders, Lincoln City Chapter*
Dave Stanard	*Siletz Moorage*
Jim Tate	*Dockside Charters*
Dave Wagner	*Devil's Lake Water Improvement District*
Chuck Willer	*Coast Range Association*

The plan is divided into sections that deal with habitat, overall considerations, 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.

2. Management Considerations—important issues to consider in formulating management policies, objectives, and actions.

3. Policies—mandatory operating principles developed specifically for management activities in the basin related to that species or topic.

4. Objectives—what is intended to be accomplished.

5. Actions—means of achieving the objective.

Legal Considerations

Besides the statewide species plans, the Siletz 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. These include:

1. Legislation—Oregon Revised Statutes.

2. Oregon Administrative Rules (OAR)—Goals and policies for commercial and sport fishing regulations, fish management, and salmon hatchery operation, including the Wild Fish Management and Habitat Mitigation policies.

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

4. Agreements with other agencies—e.g., U.S. Forest Service (USFS), Bureau of Land Management (BLM), and the state Water Resources Department (WRD).

5. Rules and regulations of other federal, state, and local jurisdictions—e.g., Oregon Department of Environmental Quality (DEQ), Oregon Department of Forestry (DOF), Oregon Department of Land Conservation and Development (DLCD).

The Oregon Plan

Subsequent to the initial writing of this plan, the State of Oregon began developing a plan for restoring salmon populations along the entire length of the Oregon coast. The culmination of this effort is called the Oregon Plan. The Siletz Plan, for the most part, provides more basin specific direction for salmonid recovery efforts than found in the Oregon Plan. The Siletz Plan, however, did require minor editing to make it consistent with the objectives and actions identified in the Oregon Plan. The wording of some objectives and actions may be different than what was developed with the steering committee, but the intent has remained the same. As new information is gathered and actions to address steelhead recovery are developed, objectives and actions in the Oregon Plan, and consequently the Siletz Plan, will be revised.

SILETZ RIVER BASIN MANAGEMENT OVERVIEW

Perhaps Oregon's best opportunity for recovery of productive native anadromous fish species exists in rivers and streams in the Oregon Coast Range, including the Siletz River Basin. These watersheds typically have vast contiguous expanses of streams that retain their inherent capacity to be very productive for an array of anadromous species. These streams have few dams, limited water withdrawals and large blocks of forested landscape. Most of this habitat has been impacted by human activities, but can be recovered through a combination of natural processes and well thought out artificial restoration projects. Viable wild populations of all native salmonid species are still present so the potential for utilization of existing and recovered habitat is high.

Fishery management in the Siletz River Basin will focus on multiple fish species and the restoration of habitat conditions that benefit the entire array of fish species (Lichatowich et al. 1995). This multi-species approach is taken because most Siletz River Basin stream reaches support co-existing populations of at least four kinds of highly valued anadromous salmonids (coho and chinook salmon, steelhead and cutthroat trout) as well as a variety of non-salmonid species. The Siletz River Basin also supports populations of spring chinook, summer steelhead and chum salmon making it the only Oregon basin with seven distinct types of anadromous salmonids. Management actions including efforts to influence habitat conditions, release of hatchery fish, or angling regulations will unavoidably affect multiple fish species, not simply the single target fish species. Siletz River Basin fishery management will be based on the assumption that overall fish production and benefits will be maximized by creating conditions that are favorable for the array of fish species, and letting natural processes function to determine the production of individual species.

All salmonid species in the Siletz River Basin are at depressed levels with the exception of fall chinook and resident cutthroat trout (Table 1). The depressed status of Siletz River Basin fish stocks has resulted from human induced factors including habitat degradation, excessive harvest, and hatchery influence in combination with natural events such as droughts, floods and El Nin˜o ocean conditions. As human induced factors are controlled and corrected, it is expected that fish abundance will increase substantially, but it is not possible to accurately forecast the shape recovery will take. In addition to the confounding effects of natural environmental variation, the recovery of individual fish species due to reduction in human impacts can only be loosely surmised. For this reason, this management plan will treat specific management targets for individual species as secondary to recovery of the entire basin and compliment of fish species.

Table 1. Status of Siletz River Basin salmonid stocks.

Species	Status	Comments
Chum salmon	Depressed	Near southern edge of range of chum salmon; present in only a few tributaries in the lower basin.
Fall chinook salmon	Healthy	Stable or increasing trend similar to other north and central coast fall chinook stocks.
Spring chinook salmon	Depressed	Influenced by habitat conditions, hatchery strays, competition with fall chinook.
Coho salmon	Depressed	Multiple factors responsible for depressed status: hatchery strays, over-harvest, loss of habitat, El Nin˜o ocean conditions.
Winter steelhead	Depressed	Multiple factors responsible for depressed status; limited inventory information.
Summer steelhead	Severely depressed	Only summer steelhead run native to Oregon coast range. Depressed due to competition with other species above Siletz Falls.
Cutthroat trout	Searun depressed, Resident healthy	Complex biology with multiple life history types.

Harvest management of wild fish will emphasize achieving adequate spawner escapement of all species to allow stocks to rebuild. Angling regulations will be designed to allow harvest of healthy species such as fall chinook while protecting sensitive species or stocks of concern such as chum salmon and wild summer steelhead. Harvest reductions for several species including winter steelhead, summer steelhead, and coho salmon will be achieved by fin clipping hatchery fish and implementing angling regulations requiring the release of all non-finclipped fish (Table 2). This will allow improved harvest opportunities while also recovering depressed wild stocks. These regulations have been in place since 1992 for steelhead and could potentially be implemented by 1998 for coho salmon. Appendix table A-1 summarizes fishing opportunities in the Siletz River Basin.

Hatchery fish will play a primary role in providing for consumptive fisheries for some species. New hatchery broodstocks from native Siletz stock will be developed. Smolt acclimation and adult recapture facilities will be set up so returning hatchery fish that are not

caught in fisheries can be removed from natural spawning areas. Impacts on natural fish will be reduced because hatchery fish will be genetically similar to native fish of the same species and will not spread extensively to natural spawning areas (Table 3). Increased survival of hatchery fish should be an added benefit from using native stocks and acclimation facilities in hatchery programs.

Habitat management will emphasize recovery of natural conditions on a watershed scale. Disturbance such as forest fires, landslides or other events that affect the landscape and aquatic habitats are recognized as a part of the natural system. It is assumed that the variety of fish species in the Siletz River Basin has developed the capacity to adapt and thrive in the face of these

Table 2. Approximate total harvest rate (ocean and in-river) on wild anadromous salmonids returning to the Siletz River Basin since 1980, and harvest rates with recent or proposed management adjustments.

Species	Harvest rate since 1980	Harvest rate with recent or proposed adjustments	
Fall chinook	~ 50-65%	~ 50 - 65%	
Chum salmon	~ 5%	~ 0	
Spring chinook	unknown	unknown	
Coho salmon	average = 56%	~ 10 - 20%	*
Winter steelhead	~ 40%	< 10%	*
Summer steelhead	~ 40 - 50%	< 10%	*
Searun cutthroat	unknown	moderate reduction	

* Denotes that harvest rate reduction on wild fish has been or will be achieved by fin clipping all hatchery fish and having selective fishery for fin clipped fish.

disturbances. It is only when systematic and excessive disturbance creates conditions outside the range of natural variability that native fish stocks are not likely to persist. Priority for habitat restoration activities will be given to watershed characteristics that are outside the range of natural variability and that are important to fish production (see Appendix B).

Individual species that are severely depressed will also be targeted for specific management activities to reduce the risk of extinction in the short term. This is necessary because recovery through a generalized watershed-fish assemblage approach will be gradual over

an extended period of time. This may not be adequate to address immediate threats to the continued viability of severely depressed species such as coho salmon and summer steelhead.

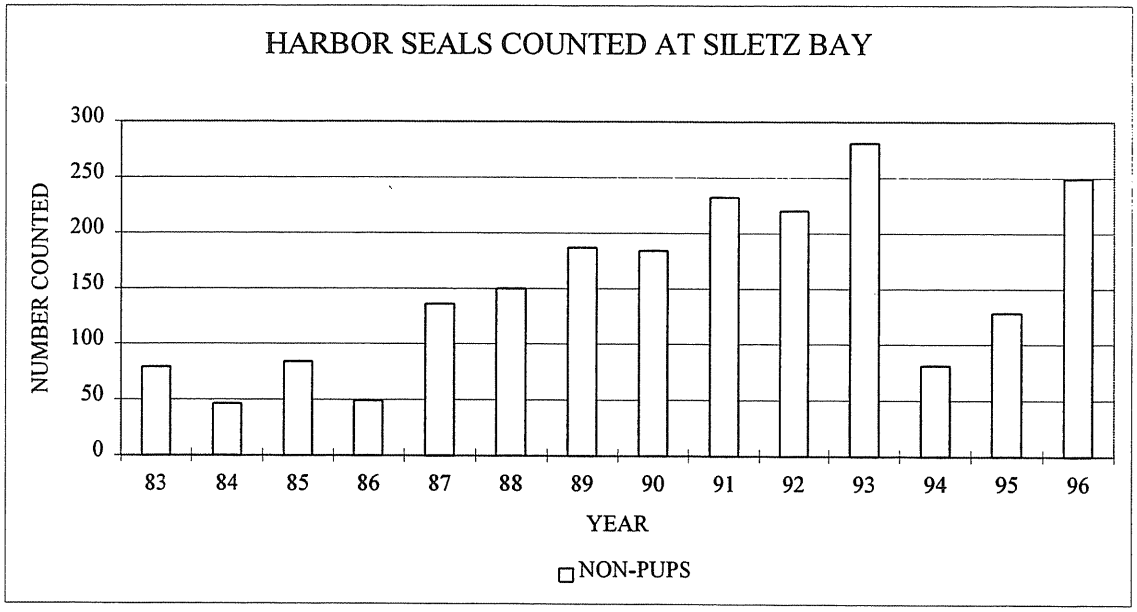
Table 3. Estimated proportion of salmonids spawning in natural production areas of the Siletz River Basin that are of hatchery origin.

Species	Proportion hatchery from 1980-94	Projected hatchery proportion with recent or proposed adjustments
Fall chinook	~ 0	~ 0
Chum salmon	~ 0	~ 0
Spring chinook	0 to >50% Rogue stock	~ 0
Coho salmon	~ 50%	~ 10%
Winter steelhead	~ 75% Alsea stock	< 10% most areas < 30% overall
Summer steelhead	~ 90%	< 10% after recovery
Searun cutthroat	~ 50% Alsea stock	~ 0

Marine mammal predation on Siletz River Basin anadromous fish is a widespread concern. Harbor seals and occasionally California sea lions are sometimes observed preying on salmonids, and increases in their abundance correspond to declines in several species of anadromous fish (Figure 1). Current research is not available on marine mammal predation in the Siletz River Basin. Previous studies indicate that predation is not a major factor contributing to declines in salmon or steelhead abundance; however, these studies are dated and may not be indicative of the current situation in the central Oregon Coast.

Action to limit marine mammal predation is not likely at this time, at least in part because of the Marine Mammal Protection Act. It would be very beneficial to have an understanding of predation levels in mid coast basins. This would increase the chance that actions could be taken to limit predation if it was determined to have a significant negative affect on a depleted or listed salmonid stock. Understanding seal and sea lion predation would also be helpful in gaining perspective on the overall array of factors influencing anadromous fish abundance. The only action this plan will propose concerning marine mammal predation is research to determine current predation levels in mid coast streams.

Figure 1. Trends in harbor seals counted at Siletz Bay.



The following policies, objectives, and actions pertain to management of all fish species in the Siletz River Basin.

Policies

Policy 1. Fish management in the Siletz River Basin shall be directed at protecting and restoring self-sustaining populations of all fish native to the basin.

Policy 2. Management of individual fish populations and their habitat shall only be emphasized when remedial actions are needed to address critical stocks or species, or when a population is the cause of constraints placed on mixed-stock fisheries or land use activities.

Policy 3. Permanent natural barriers to fish migration shall not be altered to allow fish passage and fish shall not be transplanted above these barriers.

Policy 4. Conservation objectives take priority over harvest objectives.

Policy 5. Introduction of non-native fin fish species into flowing waters of the Siletz River Basin shall be prohibited.

Objectives

Objective 1. Restore and maintain productive populations of all species of salmonids native to the Siletz River Basin.

Assumptions and Rationale

1. Maximum production and the availability for harvest of valuable salmonid species will be achieved by focusing management on restoring and maintaining a functional ecosystem.

2. The Siletz River Basin has viable wild populations of all salmonids native to the basin with the possible exception of summer steelhead.

3. A viable wild summer steelhead run can be restored by implementing actions in the section of this plan addressing summer steelhead.

4. Habitat within the Siletz River Basin is still largely suitable for production of native salmonids.

5. Focusing management on multiple species will be more efficient and have a higher probability of success than addressing single species.

6. The reaction of any single depressed fish population within the Siletz River Basin to management actions is difficult to predict. If an overall compliment of self-sustaining wild salmonids is restored, the relative abundance of individual species will be different from historic levels and largely unpredictable.

7. ODFW lacks resources for specific management of non-salmonid species. It is assumed that the needs of non-salmonid fish species in the Siletz River Basin that are not monitored will be provided for by maintaining and restoring the full compliment of indigenous salmonids.

Actions

1.1 Achieve the habitat objectives described in this plan.

1.2 Bring the level of hatchery fish in natural spawning areas of the Siletz to less than 10% of the total natural spawning population for each species except in the immediate vicinity of hatchery release and return sites.

1.3 Control fish harvest in the Siletz River Basin for each species so production is at levels approaching maximum potential.

1.4 Institute remedial recovery programs for fish species that are now severely depressed within the Siletz River Basin. For example, the area above the falls will be managed exclusively for summer steelhead.

1.5 Work with federal agencies to develop information on the relationship between marine mammals and salmonids in the Siletz River Basin. This information may be developed by studying predation in the Siletz or a basin with similar characteristics such as the Alsea or Nestucca.

HABITAT

Basin Description

The Siletz River Basin is 364 square miles in size. The main stem Siletz River is 68 miles long. Major tributaries include the North and South forks, Rock Creek, Euchre Creek, and Cedar Creek. Drift and Schooner Creeks flow into Siletz Bay near the mouth of the Siletz River (Figure 2).

The Siletz River Basin is characterized by two distinct geologic zones. Most of the upper basin, including the Siletz Gorge and North Fork Siletz River, and tidewater tributaries including Drift and Schooner creeks are in an area of volcanic geology (Baldwin 1976). This results in streams characterized by higher gradients and better summer flows. The middle sections of the basin are in areas of sedimentary geology which produce lower gradient streams and reduced summer flows. This geologic diversity creates substantial variation in stream characteristics in different parts of the basin which in turn results in a high diversity of native fish species.

Table 4 gives the approximate amount of fish habitat in the Siletz River Basin. About 613 miles of stream in the Siletz River Basin are populated by salmonid fish species.

Table. 4 Siletz River Basin size and approximate amount of fish habitat. Preliminary draft analysis.

Basin Area	364 square miles
Estuary area at high tide	1,187 acres
Stream Habitat	
Large main stem reaches: spawning by chinook only	46 miles
Medium tributaries: coho salmon and/or steelhead trout predominate	216 miles
Small tributaries: [a] (usually cutthroat only)	351 miles
Total	613 miles

[a] Estimates of small stream habitat were based on the Oregon Department of Forestry 1993 study of stream miles with fish in townships near Toledo and Seaside.

Figure 2. Land Ownership in the Siletz River Basin

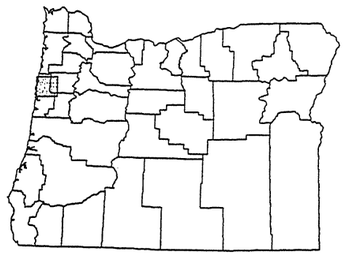
OWNERSHIP
SILETZ RIVER BASIN

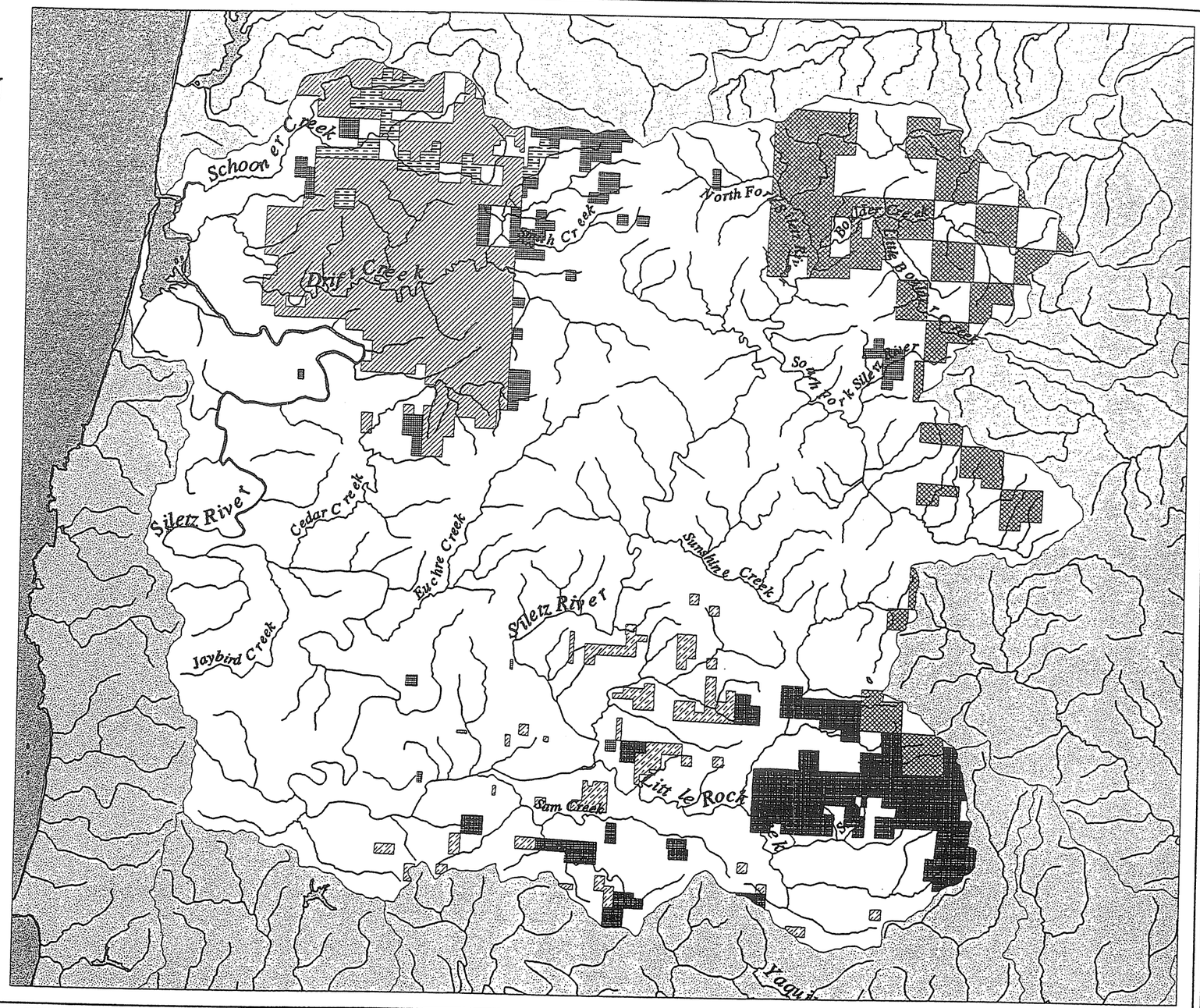
- BLM
- USFS
- O & C Lands
- State Lands
- Bankhead & Jones Lands
- Indian Reservations

MI
0 1 2 3 4

OREGON
Fish & Wildlife

Location





Land Use

Most of the land in the Siletz River Basin is in private ownership (Table 5). Federally owned land in the basin is concentrated in U.S. Forest Service (USFS) holdings in Drift and Schooner subbasins and Bureau of Land Management (BLM) ownership in the North Fork Siletz subbasin (Figure 2).

Table 5. Land ownership in the Siletz River Basin.

Basin area (square miles)	Percent of total area BLM	USFS	Siletz Tribe	State	Private
364	7.7	9.4	1.3	3.6	77.9

The dominant land use in the Oregon mid-coast is forestry (Table 6). Areas managed as forest are used to produce coniferous and deciduous trees.

Table 6. Land use in the Oregon mid-coast (Oregon Water Resources Department, 1980).

	Forest	Range	Non-irrigated agriculture	Irrigated agriculture	Urban	Water[a]	Other[b]
Total acres	1,392,765	33,093	21,745	1,249	10,966	14,199	25,510
% of total	92.9	2.2	1.4	0.1	0.7	1.0	1.7

[a] Includes natural and human-made lakes and impoundments.

[b] Includes highway interchanges, airstrips, cemeteries, and other developed areas not adjacent to urban centers.

Secondary uses of land in the Siletz River Basin include range, agriculture, and residential use. Range land includes areas characterized by grasses, shrubs, meadows, unimproved pasture and scattered trees. In the Siletz River Basin, areas managed for range are found primarily along water courses.

Hay production is the primary agricultural activity in the Siletz River Basin. Most agricultural lands are not actively irrigated and are located adjacent to the mainstem Siletz River between Moonshine Park (river mile 53) and the head of tidewater (river mile 22).

Urban land use pertains to residential, commercial, and industrial developments, including airports, schools, parks, and golf courses. Urban development in the Siletz River Basin is spread along the mainstem Siletz River from Lincoln City to Moonshine Park. Concentrations occur near Lincoln City (river mile 0) which has a population of about 6,335 (Center for Population Research and Census 1995) and the town of Siletz (river mile 41) which has a population of about 1,085 (Center for Population Research and Census 1995). There are no permanent dwellings in the upper third of the basin above Moonshine park.

ODFW Role in Habitat Management

The ODFW plays an important role in habitat management by acting as fishery experts for land management agencies with control over land use decisions. The ODFW, however, does not have regulatory control over most land management activities affecting fish habitat.

The ODFW plays a lead role in advising on fish habitat needs in land management decisions developed by State of Oregon land management agencies including the Oregon Department of Forestry, the Division of State Lands, the Oregon Water Resources Department, Department of Environmental Quality, and the Department of Geology and Mineral Industries. ODFW also plays an advisory role in local and county land use planning activities. Overall activities within this category represent the majority of land management activities affecting fish habitat on privately owned lands in the Siletz River Basin.

Federal land management agencies have their own fishery biologists who play a lead role in providing recommendations concerning fish habitat on federal lands. The ODFW consults with USFS and BLM staff in an advisory role on habitat protection on federal land. This helps assure coordination between fish management activities where ODFW has direct responsibility and land management activities by federal agencies.

The ODFW also works with land owners to implement cooperative fish habitat enhancement efforts in areas where there is a desire to do habitat improvement projects or where a deviation from general regulations is needed to address a particular situation.

Goals for Habitat Conditions

A long-term goal for fish habitat within the Siletz River Basin is to return the watershed to near natural conditions that allow fish production levels approaching those prior to human disturbance. This long-term goal recognizes that complete habitat recovery is not likely in some areas due to established allocation of land and water to other uses that are sometimes in conflict with providing complete habitat recovery. It also recognizes that the Siletz River Basin has very little fish habitat that is irreversibly lost so a high level of recovery is achievable. Progress toward this long-term goal can occur relatively quickly for some habitat attributes, but will take an extended time period for others.

The short-term goal for fish habitat within the Siletz River Basin is to reverse the declining condition of habitat so that measurable improvement or at least stabilization can be

achieved in key aspects of watershed conditions that are reflective of the basin's capacity to produce fish. These include:

1. Maintenance, or in a few instances, increases in stream flows during summer low flow periods.
2. Reduction in summer stream temperatures where artificial warming occurs.
3. Increased instream structure such as large woody debris, beaver dams, and other natural materials.
4. Decreased sediment input into the waterway.
5. Maintenance of water quality.
6. Restoration of natural fish passage conditions throughout the watershed.
7. Increased habitat area available to anadromous and resident fish.

Management to Achieve Goals

Actions in this plan will focus efforts on the short-term goal of achieving measurable improvements in watershed conditions that are reflective of the basin's capacity to produce fish. Consideration will be given to improving watershed conditions by protecting habitat from detrimental effects of land use, allowing natural recovery to progress, and undertaking specific targeted restoration projects where natural recovery is not likely to occur in a timely manner. Priority will be given to habitat features that are important to fish restoration and have been impacted by past land use practices. Management issues and approaches for each aspect of watershed condition are as follows.

Instream Flows

Stream flows upstream from the town of Siletz do not appear to be substantially altered from flows that date back to the 1920s (Figures 3-5). Relatively stable minimum summer flows indicate that the cumulative effect of existing water withdrawals are small compared to the overall flow in this area. Stream flows will continue to be monitored at the town of Siletz. This gauge will be the principal method for evaluating if existing stream flows are maintained.

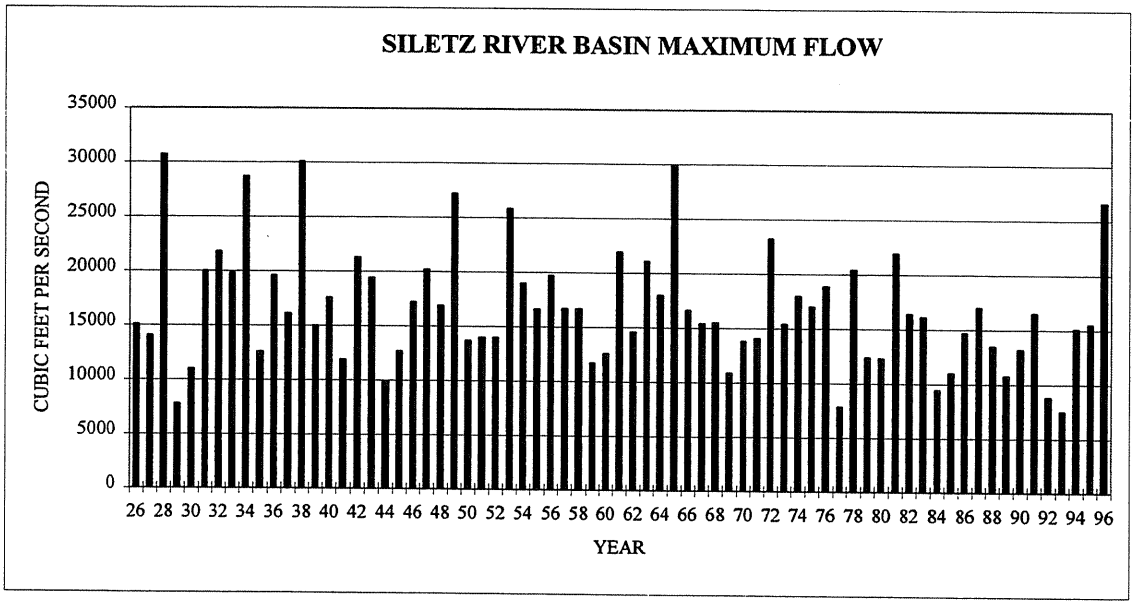
Substantial water is withdrawn downstream at the town of Siletz for the Georgia Pacific Mill in Toledo and municipal use in Newport, Toledo, and Seal Rock (Table 7). These withdrawals have a substantial effect on flows in the Siletz River downstream from the town of Siletz. Additional gauges could be developed in this area if determined necessary.

Peak flows during winter floods increase if a watershed has extensive roads or cleared land (Harr, 1983). Although peak annual flows in the mainstem Siletz River have not increased (Figure 3), it is likely that peaks in individual tributaries with extensive roads and cleared lands have increased. Intensified flood events have the potential to disrupt salmonid habitat by scouring spawning redds and reducing channel stability. Increased winter peak flows from cleared lands have been addressed on federal land by reduced timber harvest activity and road abandonment, and on state and private lands by limits on clear-cut sizes. Addressing winter flow peaking to a greater extent would require major modification in the road system on private land

and/or increase in the rotation age for clearcuts on private lands. These activities would require extensive modification of land use throughout the upslope areas of the Siletz River Basin. These land use modifications will not be prioritized in this plan because of uncertain benefits and likely landowner opposition.

The mechanism for maintaining instream flows will be enforcement of ODFW instream water rights (Table 8). Potential for increased summer flow will be dependent on conservation efforts or shifting water users away from summer withdrawals and toward use of water stored during winter high flow periods. The instream water rights do not have priority over some water uses. It is likely withdrawals will increase gradually unless the instream water right is modified to cap exempt withdrawals or existing water users are switched to the use of stored water.

Figure 3. Siletz River annual maximum flow at Siletz, Oregon.



By law, the Water Resources Department is responsible for monitoring streamflows and regulating junior users in times of shortage. In reality, the Water Resources Department is currently not staffed at the field level with sufficient personnel to adequately monitor instream flows. If instream water rights are to be of value, ODFW district personnel will need to assist the Water Resources Department in prioritizing important sites to be monitored or procuring funding for additional staff.

Figure 4. Siletz River annual mean flow at Siletz, Oregon.

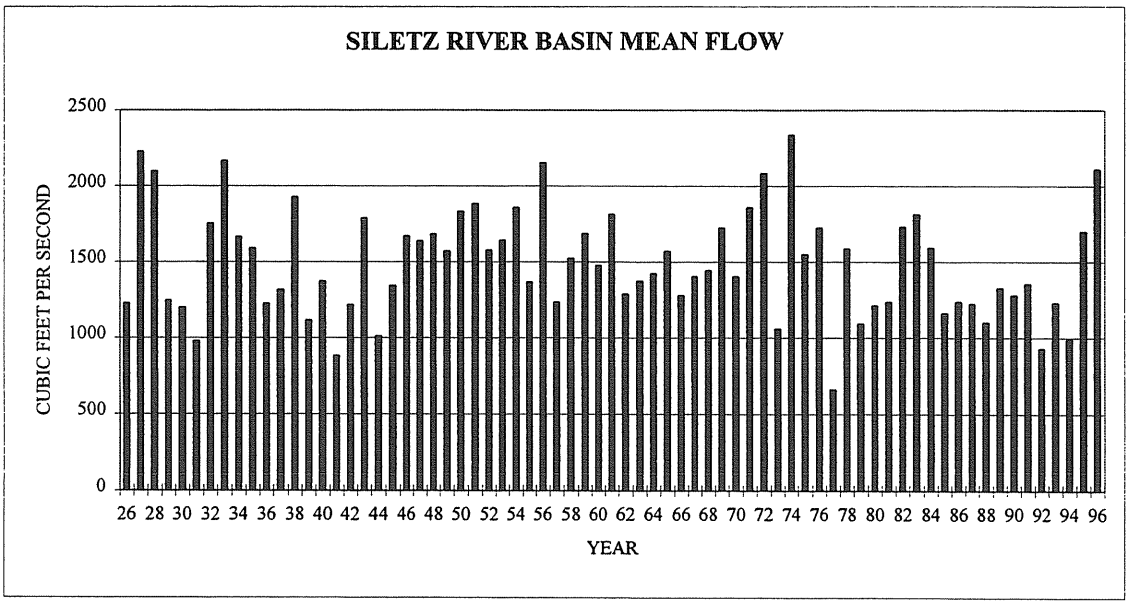


Figure 5. Siletz River annual minimum flow at Siletz, Oregon.

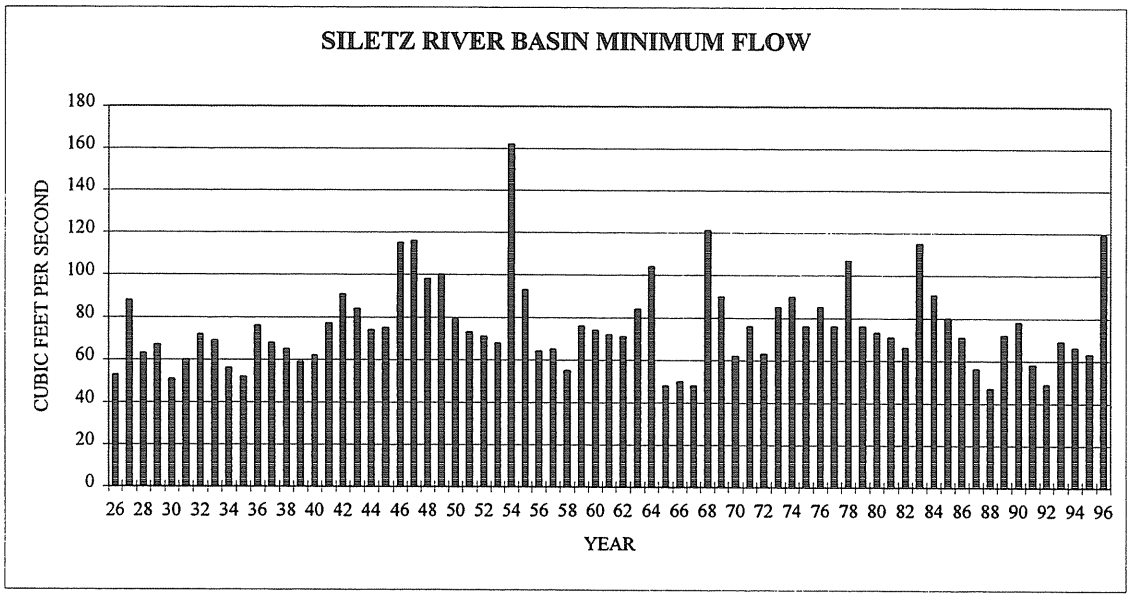


Table 7. Major Siletz River water rights at the town of Siletz.

Water right	Amount	Priority date
ODFW IWR[a]	100 cfs July-October	July 12, 1966
Georgia Pacific[b]	20 cfs	February 2, 1956
Georgia Pacific	20 cfs	February 29, 1963
Toledo	1.75 cfs	February 12, 1937
Toledo[c]	4 cfs	October 24, 1929
Toledo	4 cfs	March 23, 1979
City of Siletz	0.25 cfs	August 6, 1953
City of Siletz	1 cfs	December 20, 1985
Newport	6 cfs	March 24, 1963

[a] IWR = instream water right.

[b] Active only when flows in the Siletz River are greater than 75 cfs at the town of Siletz.

[c] Water right located 14 miles upstream from the town of Siletz.

Table 8. Instream water rights on the Siletz River from converted minimum perennial streamflows.

Location	Priority date	Exempt uses [a]	Summer minimum (cfs)
Schooner Cr. at mouth	11-3-83	H, L	20
Drift Cr. at mouth	7-12-66	D, L, M	22
	3-26-74	H, L, M	22
Siletz River			
mouth to town of Siletz	7-12-66	D, L, M	100
	3-26-74	H, L, M	100
town of Siletz to Sunshine Cr.	3-26-74	H, L	80
Sunshine Cr. to South Fork	3-26-74	H, L	50
Bear Cr. at mouth	3-26-74	H, L	2
Cedar Cr. at mouth	3-26-74	H, L	15
Euchre Cr. at mouth	3-26-74	H, L	10
Sam Cr. at mouth	3-26-74	H, L	5
Rock Cr. at mouth	3-26-74	H, L	10
Mill Cr. at mouth	3-26-74	H, L	5
Gravel Cr. at mouth	3-26-74	H, L	5
So. Fk. Siletz R. at mouth	7-12-66	D, L	8
	3-26-74	H, L	35
No. Fk. Siletz R. at mouth	7-12-66	D, L	25

[a] H = human consumption, D = domestic use, L = livestock use, M = municipal use.

In the Siletz River Basin, an additional 9 IWR applications have been filed with the Water Resources Department for consideration. These applications are listed in Table 9.

Water Temperature

Altered stream temperatures can result from a variety of land use activities and can have major ramifications for salmonids. Altered water temperatures have been linked to changes in fish survival, growth, reproductive success, migration, interspecific competition, resistance to disease and parasites and overall system productivity (Boechler and McAllister 1992). Elevated temperatures during summer low flow periods are the principal concern identified in mid-coast rivers and streams.

Water temperatures in the Siletz River have been monitored at the town of Siletz in recent years (Table 10). Additional temperature measurements have been taken at other locations.

Based on overall information, summer water temperatures in the mainstem Siletz River are near the upper limits for productive juvenile salmonid rearing from the confluence of the North and South Fork Siletz downstream to the estuary, where a cooling marine influence is felt. Siletz River tributaries are usually within suitable temperature ranges except in isolated areas where canopy cover has been lost. Cool water from tributaries flowing into the mainstem Siletz River probably provides cool water refuges during summer hot weather periods.

Water temperatures throughout the Siletz River will be monitored during the next few years using automated temperature recorders. Recent developments in technology have made this affordable. Continuous temperature monitoring devises that fit in a film canister now cost less than a hundred dollars. Temperature monitoring will complement existing records and will be used to pinpoint stream reaches where excessive warming is occurring. It will also be used to provide baseline information to evaluate effectiveness at providing cooler summer water temperatures in the future.

Research has determined that increased water temperatures in small and medium size streams usually increase in direct proportion to the increase in sunlight that reaches the water surface (Chamberlin et al 1991). In larger streams water temperature is less affected by streamside shading because of the larger volume of water and the ability of vegetation to cast a shadow over only a portion of the stream. Efforts to prevent excessive summer water temperature will focus on maintaining existing aquatic shade or increasing stream shading where needed. In forest lands, commercial forest activities are regulated for the purpose of meeting state water quality standards. The FPA water protection rules require vegetation retention buffers designed to maintain aquatic shade to meet this goal.

Loss of stream shade from residential development will be addressed through enforcement of county setbacks that currently require a 50 foot setback of undisturbed vegetation along the waterway. We will consult with the counties, other regulatory agencies, and make recommendations to bring residences that are not in compliance into compliance and all new development will be expected to be consistent with the 50 foot setback. ODFW will also provide consultation to counties to refine riparian setbacks based on characteristics of individual streams.

Table 9. Instream water right applications in the Siletz River Basin.

Stream	Reach (river miles)	Date
Siletz River	43-59	11-19-91
Bear Creek	0-2.5	3-25-91
Cedar Creek	0-2	3-25-91
Euchre Creek	0-2.5	3-25-91
Rock Creek	0-5.4	11-19-91
Big Rock Creek	0-2.2	11-19-91
Little Rock Creek	0-5	11-19-91
Mill Creek	0-2.5	11-19-91
No. Fk. Siletz River	0-1.6	10-16-92

Table 10. Maximum water temperature and number of days with water temperatures greater than 70° F in the Siletz River at the town of Siletz.

Year	Maximum temperature	Number of days greater than 70° F
1980	75	19
1981	73	11[a]
1982	73	19
1983	69	0
1984	71	4
1985	72	19

[a] Temperature not monitored over the entire year.

For agricultural lands we will consult with counties, other agencies, and make recommendations to cooperatively work with land owners to increase stream side shading and to develop cooperative standards that provide waterway protection that is consistent with other land uses in the basin.

Another probable cause of increased stream temperatures is channel widening that results from increased sediment deposition in the stream channel. Sediment deposition in the stream channel forces the flow toward the stream banks which erode, thereby resulting in a wider channel. This can be addressed by controlling the input of sediment into the drainage.

Water temperatures during the spring, winter, and fall have probably also been altered due to reduction in the riparian canopy. These alterations can impact fish by affecting life history characteristics such as egg incubation time. It will, however, be very difficult to understand and control these impacts, so in the Siletz River we will focus on providing riparian conditions needed to insulate against summer temperature increases and assume this is sufficient to address temperature alteration during other time periods.

Instream Structure

A primary factor that has reduced fish production in all coastal basins is the loss of instream habitat provided by large woody material. Instream large woody debris (LWD) is an essential habitat element for a number of reasons. LWD creates pools and backwater areas that provide slack water refuges during winter high flows and rearing habitat during the summer. LWD also provides nutrient input and storage sites, and traps sediment, including gravel required for spawning.

Instream structure is at low levels in most areas because it has been removed from stream channels to prevent fish passage problems following logging operations and to prevent jams that trigger floods, damage bridges, or interfere with boat traffic. Additionally, logging of large trees from riparian areas has cut off the primary source of continued recruitment of large woody structure to the stream channels. The situation is aggravated because riparian areas are now dominated by alder rather than conifers which provide a much better and more durable source of instream structure.

Table 11 shows reduced LWD volumes in commercial timberlands compared to wilderness areas over broad areas of western Oregon. Surveys in recent years have verified that LWD volume is very low in most areas in the Siletz (Tables 12 and 13). The Siletz is comparable to other streams in managed and old growth forests.

Table 11. Large woody debris in managed and old-growth forest streams in the Oregon coast range (Boechler and McAllister 1992).

Stream	Large woody debris Frequency (number/mile)	Large woody debris Volume (m^3/mile)	Comments
Old-Growth			
Coos/Coquille tributaries	928	783	Ursitti (1990)
South Fork Drift Creek (Alsea)	-	1,475	Schwartz (1990)
Lobster Creek	317	-	Sedell et al. (1988)
Cummins Creek	352-405	-	Sedell et al. (1988)
Average	541	1,129	
Managed			
Clatskanie River	49	48	
Coast Creek	89	57	
Elliot Creek	112	145	
So. Fk. Wilson River	50	176	
Edwards Creek	80	256	
L. No. Fk. Wilson River	134	402	Good riparian
East Creek	168	485	Beaver activity
Devils Lake Fork	148	627	Debris jam
Deyoe Creek	275	886	Beaver activity
Knowles Creek	18-53	-	Sedell et al. (1988)
Lobster Creek	18-35	-	Sedell et al. (1988)
Average	122	342	

Table 12. Siletz River Basin large woody debris situated below the average high water level in number of pieces per 100m and volume per 100m.

Lower Siletz River		
	Woody Debris	
Stream	Pieces[1] #/100m	Volume m^3/100m
Jaybird	15	40
Roy	12	29
Euchre	1.1	3
Thompson	5.1	11.9
Tangerman	3	9
Bentilla	7.8	26.1
Palmer	10.9	18.9
Brush	4.4	3.9
Religion	9.2	12.2
Branch	4	6
Big Rock	4.6	16.6
Fall	2	10
Mill	0.6	1.8
Cerine	1.8	7.1
N. Fk. Mill	5.6	8.3
Gunn	3	14.7

Upper Siletz River		
	Woody Debris	
Stream	Pieces[1] #/100m	Volume m^3/100m
Sunshine	1.1	5.4
Deer	27.5	75.8
Gravel (pre-restoration)	8.9	24.5
N. Fk. Siletz	0	0
Warnicke	0	0
Boulder	0	0
S. Fk. Siletz	11.5	14.7
Drift	31	16
Fanno	17.2	17.7
Handy	48	45
Sand	12.8	13.4

[1] Pieces 6 inches or greater in diameter and 10 feet or longer in length.

Table 13. Number of conifers within 30 meters of the active channel on either side of the stream per 1000 feet, Siletz River Basin.

Lower Siletz River Basin		
	Riparian Conifers[1]	
Stream	# > 20in DBH	# > 35in DBH
Jaybird	0	0
Roy	0	0
Euchre	0	0
Hough	0	0
Thompson	0	0
Tangerman	0	0
Bentilla	0	0
Palmer	0	0
Brush	12.4	0
Religion	3.7	3.7
Branch	0	0
Big Rock	39.1	0
Fall	0	0
Mill	0	0
Cerine	0	0
N. Fk. Mill	0	0
Gunn	0	0

Upper Siletz River Basin		
	Riparian Conifers[1]	
Stream	# > 20in DBH	# > 35in DBH
Sunshine	0	0
Deer	0	0
Gravel	0	0
N. Fk. Siletz	0	0
Warnicke	0	0
Boulder	0	0
S. Fk. Siletz	32.9	0
Drift	85	0
Fanno	12.1	0
Handy	91	0
Sand	38.6	13.5

[1] Conifers that are within a 30 meter long by 5 meter wide transect that is perpendicular to the stream channel. Transects are conducted once every 30 habitat units.

A key action to increase LWD recruitment is the recent Oregon Forest Practices Act (FPA). The FPA should increase conifer retention in buffer strips several fold, which will ultimately provide more instream LWD. Recovery will be slow, however, because most conifers in buffer strips are small or riparian zones are dominated by brush and hardwoods. The FPA will also provide flexibility to landowners to convert brush and alder dominated riparian zones to conifers which may result in better fish habitat in the long-term. Hardwoods do provide valuable LWD, but they decay quickly and are not large enough to set up in bigger tributaries.

At the local level, ODFW will request notification of all forestry activities on private or state land, and provide comment on the importance of conifer retention in buffer strips bordering important streams for fish production. The ODFW will also coordinate with Oregon Department of Forestry and private landowners to artificially place LWD in streams with high potential for coho salmon production where logging operations are taking place. These cooperative efforts will be undertaken under the Stream Enhancement Initiative (SEI), a program to implement cooperative fishery improvement projects on private timberlands. This artificial structure placement will not be done as an alternative to natural recruitment of LWD, but will be undertaken to improve fish habitat in the interim until stream-side trees mature and are recruited naturally.

The effectiveness of increasing in stream channel complexity will be evaluated using on-going habitat surveys by ODFW, private timber managers and the USFS. Measurements of vegetation in riparian areas will also be continued to see if conifers and other large trees are becoming more prevalent. This will provide a more immediate indication that we are moving in the desired direction.

Beaver Dams

Beaver dams provide a primary source of instream structure and pool habitat in many small and medium streams within the Siletz River Basin. Ponds created by beaver dams are an important habitat for juvenile coho salmon and cutthroat trout. Juvenile coho are particularly dependent on beaver ponds during winter months (Nickelson et al,1992). Stream reaches where fish habitat benefits are greatest from beavers are thought to be where beaver dams remain intact through winter freshets.

While beaver activity is strongly beneficial to fish habitat in some situations, under other conditions it appears to have a neutral or may have a negative effect. In larger streams, beaver dams tend to wash out during high water events with reduced benefits. In these same larger streams, beavers may have a negative effect on fish habitat by cutting down or preventing re-establishment of stream side trees that provide shade and a future source of LWD. Spawning gravel could be reduced to very low levels by continuous stair-stepped beaver dams, but this is thought to be rare because a relatively small amount of spawning gravel is necessary to seed large areas of rearing habitat. Beavers could also potentially have a negative effect by causing excessive summer water temperatures. This again is thought to be rare because beaver ponds tend to occur in smaller streams with naturally cool water, and because the water in beaver ponds tends to stratify with localized areas of cooler water even if surface temperatures are excessive

(Gard, 1961). Fish migration over beaver dams is a frequent concern, but does not appear to be a substantial problem based on extensive observations in the mid-coast and literature citations (Bryant, 1983).

Beaver activity can have negative economic consequences and be a general nuisance for some landowners. They plug culverts increasing road maintenance and contribute to flooding. On commercial forest lands they sometimes eliminate conifers a hundred feet or more from the water's edge.

Beaver management is one of the most important considerations in maintaining and improving fish habitat in the Siletz River Basin. ODFW will give consideration to beaver management on a case by case basis because of the variable effects on fish habitat and consequences for landowners. In areas where beavers provide stable dams that contribute to juvenile coho winter habitat, recommendations will tend toward accommodating high beaver numbers. In other areas where beavers do not create stable dams, ODFW will defer to considerations other than fish habitat in beaver management.

Sedimentation

Land use activities have generally increased the rate of erosion and sediment input into coastal waterways. In steep country such as the Siletz Gorge, erosion can take the form of torrential landslides that scour stream channels and deliver large amounts of sediment and in some cases large woody debris to downstream areas in a single event. These slides particularly impact fish habitat in small streams. They may also create instability in spawning bars and channel widening in larger waters with secondary erosion as sediment flows downstream.

In gentle topography, large slides are less prevalent, but flushing rates are low. Surface erosion of fine sediments from roads and exposed soils can degrade spawning areas and pool habitat, resulting in reduced egg-to-smolt survival. Fish habitat is frequently lost due to the accumulation of sediment in pool areas from the headwater to the estuary. The degree to which fish habitat has been impacted by the increased input of sediment into the Siletz River Basin has not been quantified.

Erosion and increased sediment input from multiple sources spread throughout a watershed act in combination to impact fish habitats downstream (Chamberlin et al 1991). Regulatory mechanisms are currently not available to address these cumulative effects. It is assumed that the application of "best management practices" (BMP'S) on a site specific basis will be sufficient to control additive effects of multiple activities in a watershed. The 1991 legislature directed the Oregon Department of Forestry to develop methods to address cumulative effects. These efforts will hopefully provide a basis to assure that multiple small sources of sediment input do not contribute to an overall degradation of fish habitat. A research priority within the Siletz River Basin should be an investigation of cumulative effects from increased erosion and methods that can be employed to control detrimental impacts.

Forestry related roads are the primary source of increased sediment input into waterways (Sidle et al., 1985). Accelerated erosion can also occur from clearcuts or other land clearance activities including aggregate mining, agriculture and urban development. Erosion from land clearing is particularly severe on steep slopes.

The only monitoring specifically for sediment in the Siletz River Basin is being conducted by Georgia Pacific (Roberts, 1995). This monitoring consists of taking modified McNeil sediment samples annually at representative sites within Georgia Pacifics ownership. The sediment sampling will be used to characterize existing sediment condition and provide a baseline to determine changes over time.

Sediment characteristics are also visually estimated in physical stream surveys which have been conducted in most tributaries to the Siletz. This sampling characterizes existing conditions. It will probably have limited value in quantifying changes over time because of the subjective nature of the estimates.

Mass failures on state and private timberlands are evaluated by Oregon Department of Forestry geo-technical specialists and summarized in a report on an annual basis (Runyon, 1993). The purpose of this report is to evaluate the effectiveness of Forest Practices Rules at reducing mass failures on forest lands.

Efforts to reduce sediment input into waterways must focus first on the road system. This includes both preventive maintenance on existing roads, and careful consideration of erosion potential in design of new roads. Examples of beneficial actions to reduce risk include pulling back sidecast, replacing undersized or deteriorated culverts, water-barring abandoned cat roads from past logging activities, putting non-essential roads to bed, and avoiding construction in high risk sites. Other beneficial actions to control erosion associated with roads are described in the Oregon Forest Practices Act and other publications (Oregon Department of Forestry, 1995; Furniss et al, 1991).

An immediate investigation of anomalously turbid water can help correct some sediment problems. In some cases muddy water will occur from a natural event such as a slide, but in other cases a correctable source can be identified.

Construction activity in a stream such as culvert placement or laying underground cables can also generate sediment. The ODFW generally discourages in-water work because such work may impact fish and wildlife habitat, degrades water quality, and interferes with water-oriented recreation. The ODFW also recognizes that some in-water projects are necessary to meet human needs and that many activities can be conducted with minimal disturbance to the environment, therefore, the ODFW has recommended time periods for in-water work that will result in the least damage to fish and wildlife. Preferred time periods may vary in different areas due to different fish populations that could be affected. The type of activity and method of operation may also influence the preferred work period. The recommended time period for in-water work in a particular area in the Siletz River Basin is available from the ODFW District office in Newport.

A variety of monitoring strategies are necessary to understand the impacts of increased sediment input on Siletz River Basin fish habitat and the effectiveness of programs to control it. Based on current understanding, this monitoring should include a continuation of the Georgia Pacific sediment sampling, and the Oregon Department of Forestry mass failure assessment on private and state timberlands. These programs should perhaps be expanded to include land in other ownerships. It would also improve understanding of sediment effects on fish habitat to examine bedload movement in larger streams such as the Siletz mainstem that are important spawning areas for anadromous fish. This could be evaluated using methods described by Nawa et al, 1988. Other methods to understand and determine trend over time in sediment input should be considered if appropriate.

Water Quality

Fish habitat in the Siletz River Basin can be influenced by factors such as chemical spills, herbicide spraying and the use of fertilizers. In some cases, a clear link has not been established between the water quality variable and impacts to fish production. Impacts of water quality problems on fish production in the Siletz River Basin will be controlled by existing water quality laws.

The ODFW will work with the Oregon DEQ to refine tolerances for potential water quality contaminants that could impact aquatic productivity. The ODFW will also work with the DEQ and other agencies to monitor water quality to assure that standards are met.

Fish Passage

There are no major areas of the Siletz River that are inaccessible to anadromous fish due to artificial blockages. However, impassable culverts prevent anadromous fish from reaching a percentage of the small streams. Obstructions to the movement of juveniles is more frequent because of their reduced ability to pass culverts during high flows. Juvenile steelhead, coho and cutthroat all have seasonal upstream migration patterns (Skeesick, 1970; Moring and Lantz, 1975). The Oregon Forest Practices Act requires that all new stream crossings be maintained so they are passable by both adult and juvenile salmonids. The proportion of stream habitat where culverts currently impede fish passage is not well documented.

Inventory specifically for fish passage conditions at culverts is now being conducted by major industrial landowners including Georgia Pacific and Boise Cascade. Additional culvert inventory information is being collected by volunteers and agencie's staff. An ultimate goal is to inventory fish passage conditions at all culverts on fish bearing streams within the Siletz.

The cost to correct individual fish passage problems, and the benefits that will result will be highly variable. Prioritization will be necessary to determine where resources should be allocated to achieve the highest benefits. The most cost effective repairs will be pursued first with successive work in areas with lower cost benefits. In a few cases it will not be feasible to correct problems because of extremely high cost relative to benefits.

Passage problems at culverts or other structures can be addressed through direct action by landowners, through cooperative efforts with cost sharing, or by evoking fish passage laws which require that passage at all artificial structures be maintained.

Existing fish ladders on streams in the Siletz River Basin are listed in Table 14. The ODFW will periodically check these ladders to assure they are functioning properly.

Table 14. Fish ladders on streams in the Siletz River Basin.

Location	Name	Type	Height (ft.)	Year built
Schooner Creek				
North Fork	No. Fk. Schooner Cr. Weirs	Concrete pool weir	16	1987
South Fork	So. Fk. Schooner Cr. Falls	Denille	20	1985
North Creek (Drift Cr.)	North Creek Culvert	Concrete weir	6	1982
Siletz River	Siletz Falls Fishway	Weir	41	1953
Cedar Creek	Cedar Creek Falls	Weir	10	1949
Mill Creek(Logsden)	Mill Creek Falls Fishway	Weir	9	1963
Sunshine Creek	Sunshine Creek Falls	Rock cut	8	1963
South Fork	Valsetz Lake Sills	Log sills	36	1988
Beaver Creek	Beaver Creek Culvert	Concrete weir	5	1990

Water diversions can also impact fish that are removed from the stream along with the diverted water. Large water diversions that are now active in the Siletz River Basin are adequately screened to prevent loss of fish. ODFW will continue to work with the Oregon Water Resources Department (WRD) and those responsible for water diversions to assure that adequate screening is maintained or installed on these and other diversions that may occur in the future.

Aquatic Habitat Area

Habitat area can be reduced by channelization, diking or by filling. Major areas of loss are diked estuarine areas and sloughs in floodplains used for agriculture. These areas are very productive and contribute to the ability of juvenile salmonids to survive winter flow conditions.

Estuarine losses can sometimes be remedied by breaching dikes. Further loss of habitat area from diking and filling is now controlled by laws on filling wetlands and waterways.

Aerial photos can be used to evaluate changes in aquatic habitat area over time. The availability of historic aerial photos and time schedules for future photos has not been investigated.

Policies

Policy 1. The Department shall actively pursue and promote habitat protection and improvement necessary to achieve the objectives for management of the basin's aquatic resources.

Policy 2. The Department shall coordinate with and advise land owners and management agencies of the Siletz River Basin.

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

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

Objectives

Objective 1. Maintain or increase instream flows during summer low flow periods in the Siletz River Basin.

Assumptions and Rationale

1. Adequate instream flows are necessary for fish passage, spawning, and rearing.

2. The ODFW acts as an advisory agency to the WRD, which is responsible for water use regulations.

3. The WRD will have primary responsibility to measure stream flows.

Actions

1.1 Evaluate stream flows by using flow monitoring at the town of Siletz and other locations if necessary.

1.2 Follow through on securing IWR's from existing applications and apply for instream water rights on additional streams which exhibit high fish and wildlife values.

1.3 Attempt to acquire instream water rights that are abandoned.

1.4 Request the WRD to monitor water diversions and strictly enforce ODFW's instream water rights.

1.5 Track the cumulative volume of water withdrawals in the Siletz River Basin in cooperation with WRD.

1.6 Recommend that new irrigation rights or extended domestic water rights not use summer flows below instream water rights.

1.7 Recommend that additional water needs for municipal use in Toledo, Newport or Seal Rock or additional industrial uses be provided from reservoirs that store water during the winter.

1.8 Support reservoir storage as an alternative to existing direct stream water withdrawals.

Objective 2. Reduce summer water temperatures where artificial warming occurs that is detrimental to fish.

Assumptions and Rationale

1. Water quality concerns in the basin are primarily related to high water temperatures in the mainstem Siletz River and its large tributaries.

2. Lack of shading from riparian vegetation has increased water temperatures in the basin.

3. Water temperatures can be monitored using automated temperature recorders that are affordable.

4. Temperature monitoring will complement existing records and will be used to pinpoint stream reaches where excessive warming is occurring.

5. Temperature monitoring will provide a baseline to evaluate effectiveness at providing cooler summer water temperatures in the future.

Actions

2.1 Implement a comprehensive program to measure stream temperatures throughout the basin in collaboration with private landowners and other agencies.

2.2 Monitor stream temperatures on a long-term basis in key areas.

2.3 Encourage riparian shading in forested lands where beneficial reductions in stream temperature will result.

2.4 Increase riparian shading in agricultural lands by working cooperatively with land owners and other agencies to increase stream-side shading.

2.5 Work with regulatory agencies and the counties to give emphasis to increase riparian shading along important fish production streams in residential or developed areas through enforcement of county setbacks which require 50 feet of undisturbed vegetation.

2.6 Recommend actions that will result in the reduction of inputs of sediments into stream channels which result in channel widening and greater exposure of the stream channel to warming.

2.7 Collaborate to share stream temperature data between public and private entities.

Objective 3. Increase instream channel complexity in the Siletz River Basin.

Assumptions and Rationale

1. Instream channel complexity in freshwater is necessary for restoring productive populations of coho salmon, winter steelhead, summer steelhead, and cutthroat trout.

2. Estuarine channel complexity is beneficial to all anadromous salmonid populations in the basin

3. Instream channel complexity has been severely reduced from historic levels.

Actions

3.1 Measure instream levels of natural channel complexity and vegetation in the streamside riparian zone in collaboration with other agencies and landowners.

3.2 Recommend that existing trees in buffer strips that are likely to be recruited to stream channels as large woody debris be maintained during comment on land use activities.

3.3 Identify areas with high potential for benefiting from artificial input of LWD.

3.4 Work cooperatively with Oregon Department of Forestry and private landowners to artificially place LWD in streams on state and private forest lands.

3.5 Encourage beaver populations in stream reaches where beaver dams benefit fish habitat.

3.6 Coordinate with Oregon Department of Forestry and private landowners to re-establish conifers in riparian areas where it is possible to do so without removing existing alder and softwood species or trapping beavers to the extent that other beneficial values from the buffer strip are compromised.

3.7 Promote retention of LWD in the estuary.

Objective 4. Reduce artificially accelerated erosion rates and inputs of sediments into waterways in the Siletz River Basin.

Assumptions and Rationale

1. The principal source of artificially induced sediment input is from the road system.

2. Sedimentation of spawning and rearing habitat reduces fish production.

Actions

4.1 Identify standardized methods to measure and monitor sedimentation rates in stream channels in collaboration with other agencies and landowners.

4.2 Measure and monitor sedimentation rates in stream channels.

4.3 Consider cumulative sediment input when providing recommendations on land use activities.

4.4 Make recommendations to correct road system problems that contribute to increased erosion and sedimentation of waterways.

4.5 Report all mass failures on state or private forest lands to ODF and review the ODF report on failures as a basis to improve understanding of mechanisms causing failures. Develop methods to report and summarize mass failures on other landownerships.

4.6 When anomalously turbid water is observed, investigate causative factors and correct if feasible.

Objective 5. Prevent chemical contaminants from degrading fish habitat in the Siletz River Basin.

Assumptions and Rationale

1. The Oregon Forest Practices Act's "Application of Chemical" rules are adequate to protect fishery habitat from detrimental impacts during herbicide applications on forest lands.

2. The Siletz River Basin Fish Management Plan will not be a forum to refine standards for chemical applications on forest lands.

Actions

5.1 Recommend that land management agencies or private landowners measure water quality parameters that are important to fish in areas where problems may occur.

5.2 Work in a consulting capacity with DEQ to enforce the existing chemical application rules and water quality standards where detrimental impacts to fishery resources are a concern.

Objective 6. Restore natural fish passage conditions in the Siletz River Basin.

Assumptions and Rationale

1. The fish assemblage in the Siletz River Basin will be the most productive if natural passage conditions exist in the basin.

2. Natural barriers to fish migration will not be altered.

Actions

6.1 Inventory culverts and other artificial obstructions that impede passage of juvenile and adult fish in collaboration with other agencies and landowners.

6.2 Pursue measures to correct passage problems associated with culverts, dams, tide gates, and other artificial obstructions where benefits exceed costs.

Objective 7. Increase habitat area available to fish in the Siletz River Basin.

Assumptions and Rationale

1. Fish habitat can be lost due to channelization, diking or filling of natural waterways.

Actions

7.1 Evaluate historic, existing, and future aquatic habitat areas based on stream surveys, aerial photographs, etc.

7.2 Identify high priority habitats (spawning areas, etc.) which should be protected from waterway alterations.

7.3 Make recommendations to prevent channelization of streams and rivers.

7.4 Make recommendations to prevent the diking and filling of wetlands and estuaries.

7.5 Pursue measures to restore historic habitat areas lost due to channelization or diking where fishery benefits will occur.

Objective 8. Coordinate with other agencies and landowners to implement habitat protection and restoration activities.

Assumptions and Rationale

1. The ODFW has authority for direct fish management activities, but must coordinate with land managers to integrate fish management activities with habitat management.

2. Most mid-coast basins have land management responsibility that is controlled by multiple jurisdictions..

3. Watershed councils provide a forum for coordination of activities.

Actions

8.1 Communicate with land management entities so habitat and fish management activities are integrated.

8.2 Participate in and provide technical assistance to watershed councils within the Siletz River Basin.

CHUM SALMON

Background

Chum salmon are native to the Siletz River Basin. Historically, the distribution of chum salmon along the Pacific coast has ranged from the Sacramento River in California north to the Arctic Ocean (Groot and Margolis 1991). Currently, the central Oregon coast is the southern extent of self-sustaining chum populations. While chum salmon occur in greater numbers in coastal streams to the north, few are observed in streams and river systems south of the Alsea River. Chum salmon are found in only a few tributary streams in the lower Siletz River Basin, most notably Bear Creek and Cedar Creek (Table 15, Figure 6). There are no hatchery releases of chum salmon in the Siletz River Basin.

Table 15. Siletz River Basin chum salmon observations during intensive spawning area surveys, 1985-94. Survey areas without chum are not listed.

	Number observed						
Survey area	1986	1987	1988	1993	1994	1995	1996
Bear Creek	316	76	114	17	83	67	9
Cedar Creek	106	0	4	0	48	5	0
Euchre Creek	5	0	0	0	0	0	0

Status

Chum salmon are listed by the state of Oregon as a sensitive species because of small run sizes and statewide declines in abundance.

Chum salmon are present in small numbers in the Siletz River Basin. The small run size is probably a result of the location of the Siletz River near the southern extreme of chum salmon in North America. Insufficient information is available to describe the trend in the Siletz River Basin chum salmon population. It is thought that returns average a few hundred per year.

Records from commercial net fisheries in the Siletz River Basin from 1923 to 1940 report an average of about 1,200 chum landed per year. The average chum commercial catch during this period shows declining amounts moving south along the Oregon coast (Figure 7). This is indicative of the southern fringe of chum salmon distribution.

Figure 6. Distribution of Chum Salmon in the Siletz River Basin

CHUM DISTRIBUTION SILETZ RIVER BASIN

Spawning & Rearing

Rearing Only

Migration Routes & Fish Presence

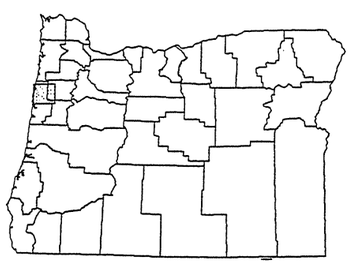
Fish Hatchery

Barrier to Migration

MI
0 1 2 3 4

OREGON
Fish & Wildlife

Location



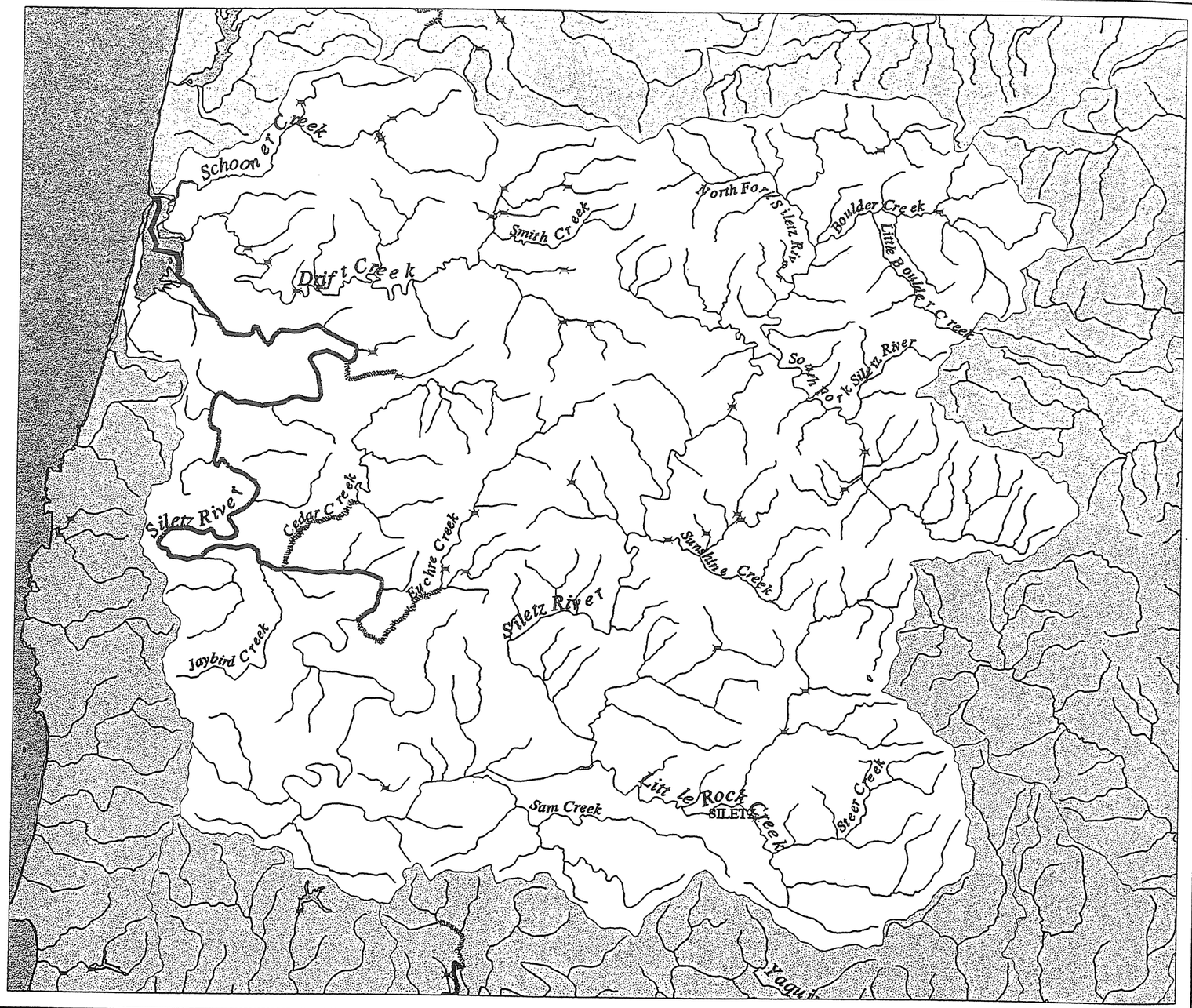
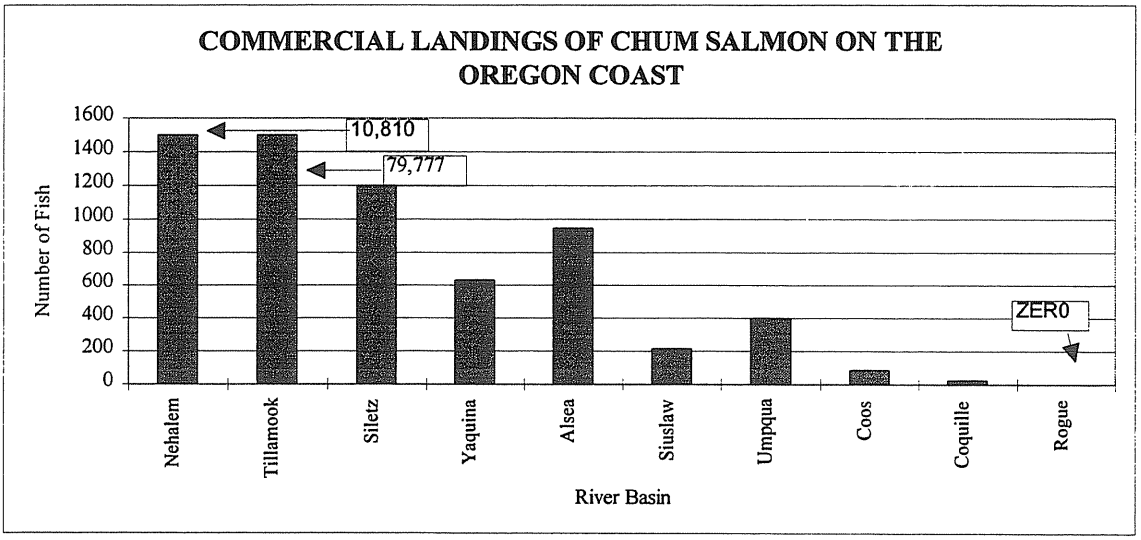


Figure 7. Average chum salmon landings reported in 1923-1940 commercial fisheries within Oregon Coastal River systems.



Life History Characteristics and Habitat Needs

Adults generally return to spawn from October to December (Henry 1954). Chum salmon are not very adept at passing barriers. Maintaining easy upstream passage for adults is essential.

Chum salmon spawn in lower portions of stream systems. Erosion in the basin often contributes sediment that is deposited or creates instability on gravel bars used by spawning chum.

Juvenile chum salmon rear only a very short period of time in freshwater before migrating downstream into the brackish water of the estuary. Estuarine rearing areas include shallow side channels, many of which have been lost due to dikes and tidegates. Juveniles smolt and migrate to the ocean in late spring or early summer.

Habitat Restoration Activities

Because of the limited distribution and sensitive status of chum salmon, habitat restoration efforts targeted at tributary streams containing chum are a priority in the Siletz River Basin. Proposed habitat restoration activities include:

1. Survey all road crossings that could be blockages to adult migration and correct those that may be a problem. This action should be targeted at streams where chum are now present or streams in immediate proximity to present chum runs where re-colonization would be likely if passage were

improved. This is a priority because chum salmon are the weakest migrators of all anadromous fish on the central coast.

2. Identify and correct sources of accelerated sediment input into tributary systems that are important for chum salmon.

Angling and Harvest

All angling for chum salmon has been prohibited in the Siletz River Basin since 1992.

Management Considerations

Chum salmon in the Siletz River Basin will be managed for wild production only. Chum salmon are listed as a sensitive species statewide. Land management activities that may threaten Siletz River Basin chum salmon will be avoided where possible. Protection of chum habitat focuses on maintaining upstream passage for adults, preventing siltation in drainage areas upstream from spawning grounds, and protecting or restoring estuarine rearing areas for juveniles. Achieving habitat objectives outlined in the Habitat chapter will generally provide the habitat for chum salmon. Chum salmon status in the Siletz River Basin is likely to remain such that angling for chum salmon will remain closed.

Policies

Policy 1. The Siletz River Basin shall be managed for naturally produced chum salmon except for hatchery releases designed specifically to assist in the recovery of the wild population.

Objectives

Objective 1. Achieve an annual chum salmon spawning escapement of at least 300 adults.

Assumptions and Rationale

1. A minimum of 300 adults is needed to maintain genetic fitness in the population.

2. Fish populations at the edge of their species range have an increased risk of extinction.

3. Accomplishing habitat protection and restoration objectives will provide the habitat necessary to support chum salmon populations.

4. Targeted efforts directed at Bear and Cedar Creeks will help assure the continued viability of Siletz River Basin chum salmon.

Actions

1.1 Conduct chum salmon spawning surveys annually in Bear and Cedar creeks to monitor trends in escapement.

1.2 Conduct exploratory surveys to look for other Siletz River tributaries with consistent chum returns.

1.3 Advise landowners of chum populations and recommend provisions that will protect their habitat.

1.4 Implement habitat restoration efforts designed primarily to increase chum salmon production in collaboration with other agencies and land managers.

1.5 Maintain closure of all angling for chum salmon unless run size increases substantially above current levels.

FALL CHINOOK SALMON

Background

Fall chinook are native to the Siletz River Basin. Important spawning habitat for fall chinook is found in larger tributaries and the mainstem (Figure 8). Areas known to have good spawner densities include Drift Creek, Cedar Creek, Euchre Creek, Rock Creek, Sunshine Creek and the mainstem Siletz River above Moonshine Park (river mile 52).

There have been very few hatchery releases of fall chinook made in the Siletz River Basin. Currently, there is no hatchery program for fall chinook.

Status

The Siletz River Basin supports a healthy wild fall chinook population with a population size estimated at 5,000-10,000 adult fish per year.

Counts of fall chinook in standardized spawning ground surveys indicate a stable or slight increase in escapement since surveys were begun in 1952 (Figure 9). Fall chinook in the Siletz River Basin have not shown the clear increase in population size that is evident in fall chinook populations in nearby rivers. Compared to other coastal river systems, the Siletz River Basin supports high densities of juvenile chinook that tend to be small in size, indicating that rearing habitat is fully seeded (Nicholas and Hankin 1988).

Current inventory of Siletz River Basin fall chinook consists of annual surveys of spawning chinook in Cedar, Euchre, Rock and Sunshine creeks. This provides reasonable coverage of mainstem tributaries, but omits Drift Creek, a major tidewater tributary with a large fall chinook run. It is recommended that a Drift Creek spawning survey be added to the annual inventory base.

Life History Characteristics and Habitat Needs

Adults enter the system primarily during September and October. Peak spawning occurs during November.

Juvenile fall chinook rear for a short time in the vicinity of spawning, but spend the most time in the mainstem and estuary. Juveniles enter the ocean in their first year of life from mid-summer through October.

The healthy status of fall chinook indicates that habitat requirements for this species are currently being provided. Concern exists that increased timber management activity in the upper

Figure 8. Distribution of Fall Chinook Salmon in the Siletz River Basin

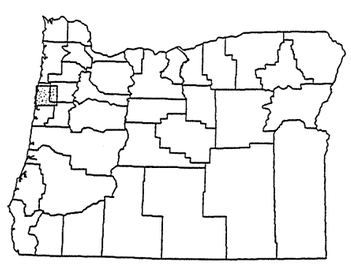
FALL CHINOOK DISTRIBUTION SILETZ RIVER BASIN

- Spawning & Rearing
- Rearing Only
- Migration Routes & Fish Presence
- Fish Hatchery
- Barrier to Migration

MI
0 1 2 3 4

OREGON
Fish & Wildlife

Location



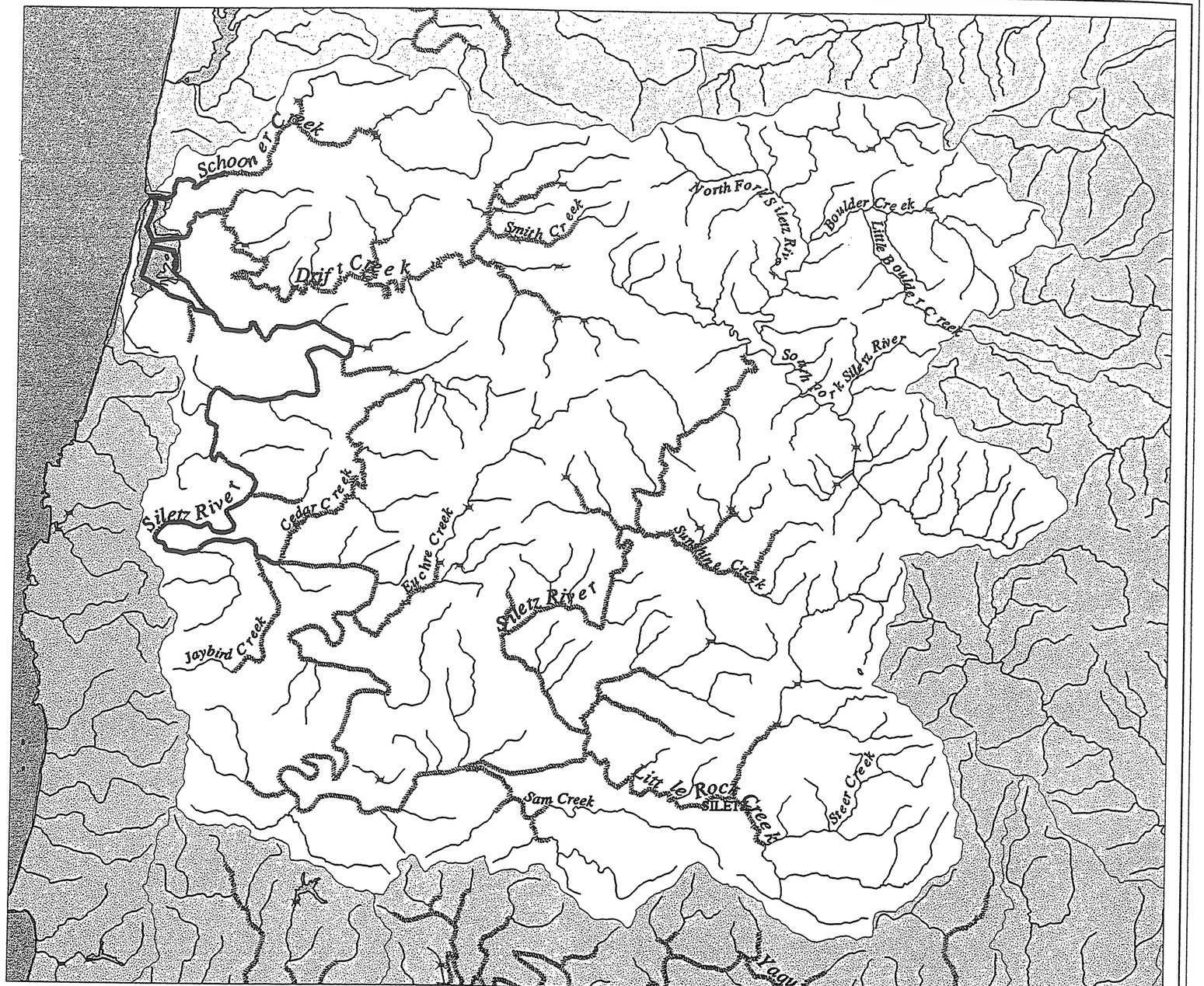
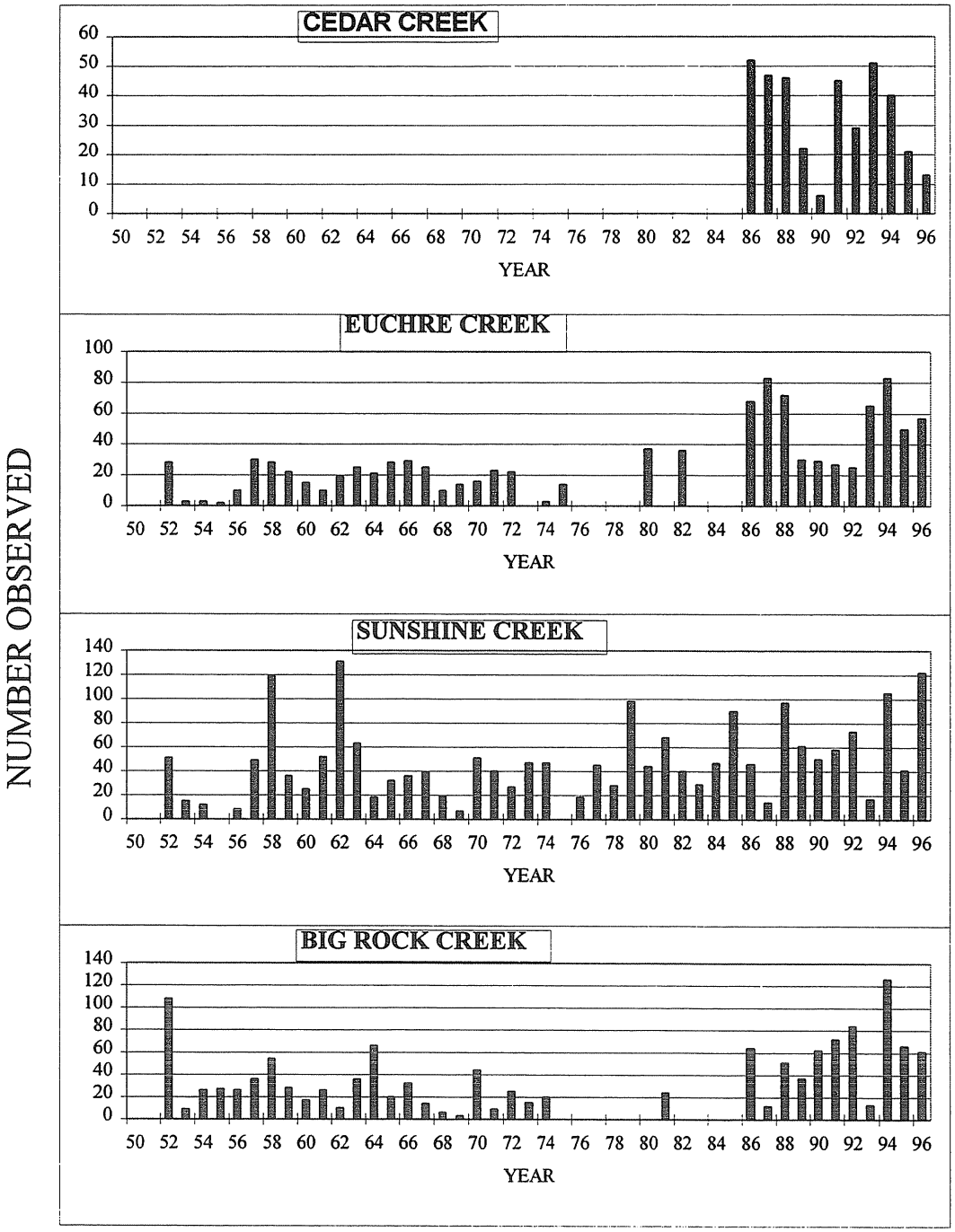


Figure 9. Fall chinook spawning survey peak counts, Siletz River Basin.



basin could create siltation and land slides which reduce gravel bar quality and stability in spawning areas used by fall chinook. Care is needed to assure that land use activities do not result in cumulative impacts to spawning habitat.

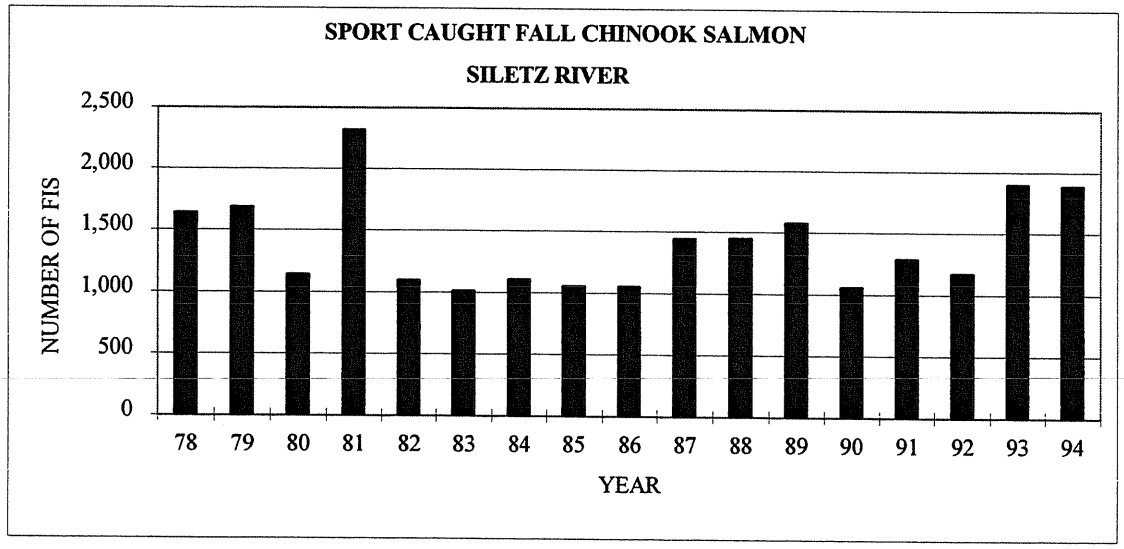
Angling and Harvest

Commercial net fisheries in the Siletz River Basin harvested from 5,000-13,000 fish each year from 1892 through 1925. Harvest then declined to 1,000-2,000 fish annually from 1926 through 1956. About half the commercial catch was made during July and August, and half was made during September and October. This indicates either that the fall chinook run historically had an earlier time of river entry, or that a spring or summer race of chinook contributed substantially to the commercial catch.

The recreational catch of the fall chinook within the Siletz has averaged about 1,200 fish per year and appears to be stable (Figure 10). There is no direct information on where Siletz fall chinook are caught in ocean fisheries, but based on observations in nearby rivers it is thought to be off the Canadian and Alaskan coasts.

The existing angling regulations in the Siletz River Basin are designed to maximize opportunity in the bay, main stem Siletz River, and larger tributaries where snagging or harassment of spawning fish is not excessive. Areas where snagging or harassment of spawners frequently occur are generally closed to chinook angling, particularly for spring chinook. It is probable that refinements to these regulations will continue during the bi-annual angling regulation review process.

Figure 10. Sport caught fall chinook salmon, Siletz River Basin.



Management Considerations

Fall chinook salmon in the Siletz River Basin will be managed for wild production only, as specified in the Coastal Chinook Salmon Plan (ODFW 1991). The wild fall chinook population is healthy and relatively abundant. Maintaining current angling regulations and harvest rates is the long-term fishery objective.

Policies

Policy 1. Fall chinook in the Siletz River Basin shall be managed for wild production only.

Objectives

Objective 1. Achieve an average annual peak count of 50 adult and jack fall chinook per mile in spawning survey index areas in the Siletz River Basin.

Assumptions and Rationale

1. The Siletz River Basin is producing fall chinook smolts at levels approaching the full capacity of the habitat. Natural production can be expected to increase only slightly if at all in the near future.

2. The average peak count in the four index areas since 1980 had been 50 adults and jacks per mile (Cooney and Jacobs 1993).

3. The escapement objective is based on the assumption that ocean survival of fall chinook smolts will be similar to past years' averages.

4. The escapement objective is based on the assumption that harvest of fall chinook in ocean and freshwater fisheries will remain similar to recent years.

5. Accomplishment of watershed habitat protection objectives will be successful.

6. Estuarine habitat is critical to fall chinook production in the Siletz River Basin.

Actions

1.1 Monitor fall chinook escapement in the four standard spawning surveys.

1.2 Establish a survey for spawning fall chinook in Drift Creek. Conduct the survey annually.

1.3 Maintain existing angling regulations except for refinements during the bi-annual regulation setting process to protect concentrations of holding or spawning adult fall chinook.

1.4 Propose more conservative angling regulations within the Siletz River Basin during the bi-annual regulation process if escapement shows a consistent downward trend.

1.5 Implement emergency angling regulation modifications if anomalous environmental conditions such as extended drought make fish excessively vulnerable. Prior to implementation of emergency regulations hold a public meeting in Lincoln City to take public input on options.

1.6 When reviewing proposals for land use activities and development associated with estuarine areas, give emphasis and protection of features important to juvenile chinook production.

Objective 2. Provide a potential in-river harvest of 1,200 fall chinook annually.

Assumptions and Rationale

1. Favorable conditions for fall chinook production will continue.

2. The average catch of fall chinook during 1983-93 was about 1,200 based on punch-card estimates.

3. Punchcards will continue to be used to estimate fall chinook harvest.

4. Angling regulation changes to reduce spring chinook harvest or fall chinook snagging and harassment will not reduce fall chinook harvest appreciably.

Actions

2.1 Maintain existing angling regulations if fall chinook escapement remains stable.

Objective 3. Cooperate with the Siletz Tribe in developing a mutually acceptable fishery based on provisions in the Agreement (US Public Law 96-340).

Assumptions and Rationale

1. An agreement between the State of Oregon and the Confederated Tribes of Siletz Indians defines tribal fishing rights and the cultural fishery in the Siletz River Basin. This plan will be consistent with the agreement.

2. The agreement specifies that Siletz tribal fisheries shall be allowed in three sites on tributaries to the Siletz River.

3. Up to 200 adult salmon may be taken in these fisheries annually.

4. Healthy wild fall chinook runs may contribute to tribal fisheries in the Siletz River Basin.

5. The agreement specifies that ODFW shall manage and where appropriate enhance the salmon resource in each designated stream consistent with sound principles of fisheries science.

Actions

3.1 On streams with tribal fishing sites, manage and if necessary, restore habitat to enhance the tribal fishery.

3.2 If mutually acceptable, adjust tribal fishing sites.

SPRING CHINOOK SALMON

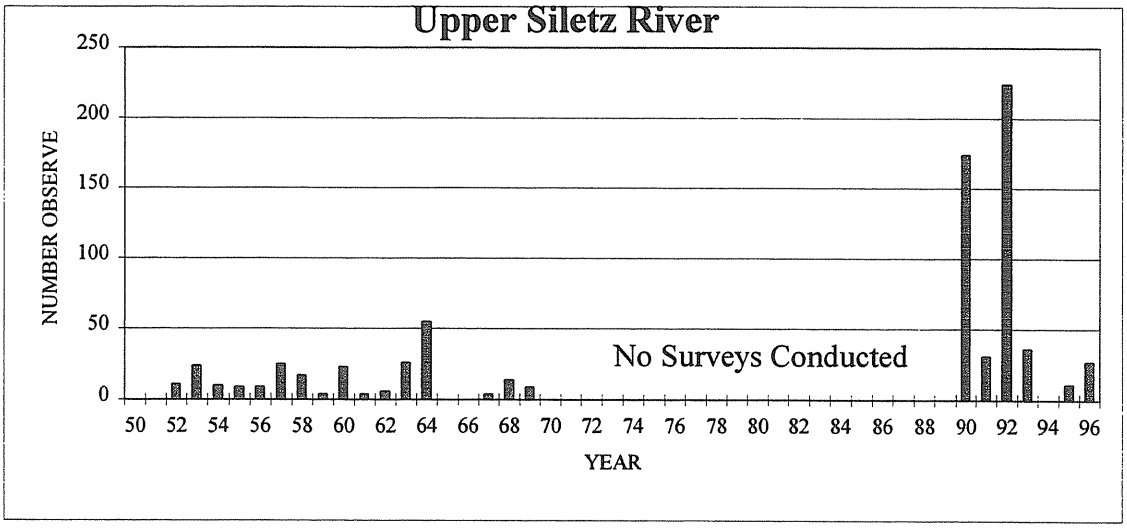
Background

The Siletz River Basin supports a spring chinook run in addition to the more abundant fall chinook. Spring chinook spawning in the Siletz River Basin occurs in the mainstem Siletz River from just above tidewater to the upper gorge (Figure 11). There is no hatchery program for spring chinook in the Siletz River Basin.

Status

The spring chinook run is thought to average only a few hundred fish per year. Indexes of spring chinook abundance include observations in standardized spawning surveys and resting hole counts (Figure 12 and 13). There have been increases in these estimates in recent years. These increases have been attributed to stray private hatchery spring chinook rather than to an improvement in the status of the native stock. This has been confirmed, in part, by recovered coded wire tags and observed fin marks.

Figure 12. Spring chinook spawning surveys peak counts, Siletz River Basin.



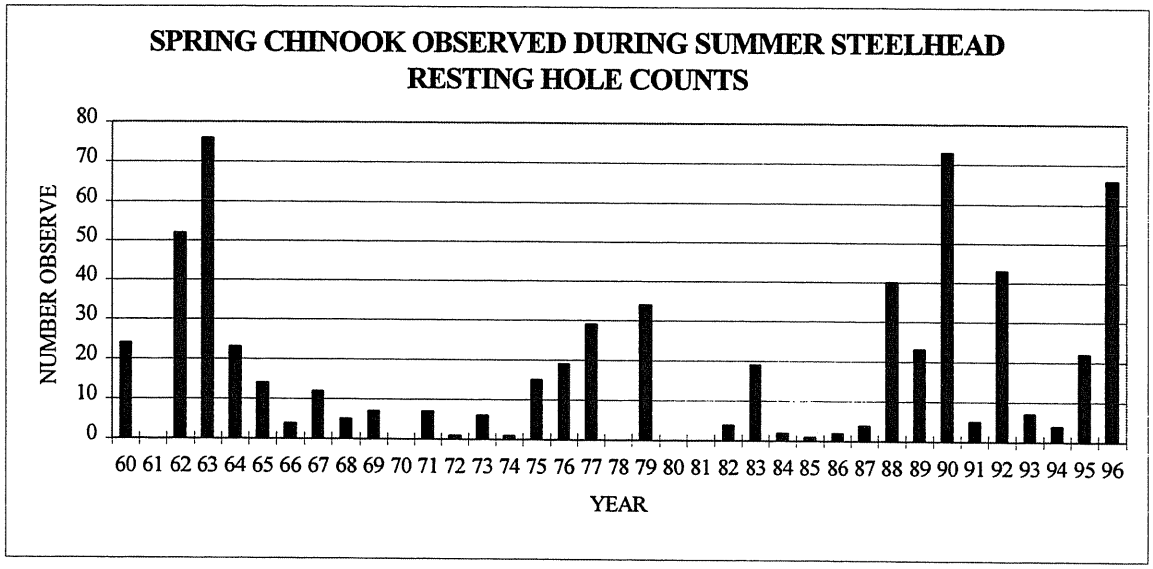
Life History Characteristics and Habitat Needs

Spring chinook enter the Siletz River Basin from May through July. Spawning occurs during September and October throughout the main stem Siletz River where suitable gravel bars exist.

Juvenile spring chinook are thought to rear in the mainstem Siletz River and estuary, similar to fall chinook. Juveniles enter the ocean during the summer or early fall of their first

year of life. Competition between juvenile fall and spring chinook is probably occurring to some extent.

Figure 13. Spring chinook resting hole counts, Siletz River Basin.



Habitat factors that limit spring chinook in the Siletz River Basin are not well understood. Possible factors include lack of suitable holding water for adults, disturbance of adults in holding and spawning areas, and competition with fall chinook during juvenile rearing. Cooler water temperatures in the mainstem Siletz River would benefit adult spring chinook that hold in the main stem throughout the summer as well as rearing juvenile chinook. Concern exists that increased timber management activity in the upper drainage could create siltation and land slides which reduce gravel bar quality and stability in spawning areas used by spring chinook. Care is needed to assure that land use activities do not result in cumulative impacts to spawning habitat.

Angling and Harvest

Recreational catch of spring chinook has averaged about 50 fish per year up until the last few years, when it increased to over 100 per year (Figure 14). It is thought that this increase resulted from stray hatchery spring chinook from the private hatchery at Newport (Rogue stock). The release of spring chinook at the private hatchery has been discontinued. Future programs for spring chinook at this facility are prohibited in the Yaquina Basin (ODFW 1991).

The existing angling regulations in the Siletz River Basin are designed to maximize opportunity for chinook harvest in Siletz Bay, the mainstem Siletz River, and larger tributaries where snagging or harassment of spawning fish is not excessive. Areas where snagging or harassment of spawners frequently occur are generally closed to chinook angling, particularly for spring chinook. It is probable that refinements to these regulations will continue during the bi-annual angling regulation review process.

Figure 11. Distribution of Spring Chinook Salmon in the Siletz River Basin

SPRING CHINOOK DISTRIBUTION SILETZ RIVER BASIN

Spawning & Rearing

Rearing Only

Migration Routes & Fish Presence

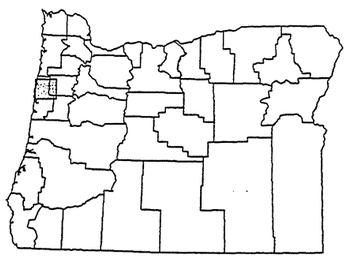
Fish Hatchery

Barrier to Migration

MI
0 1 2 3 4

OREGON
Fish & Wildlife

Location



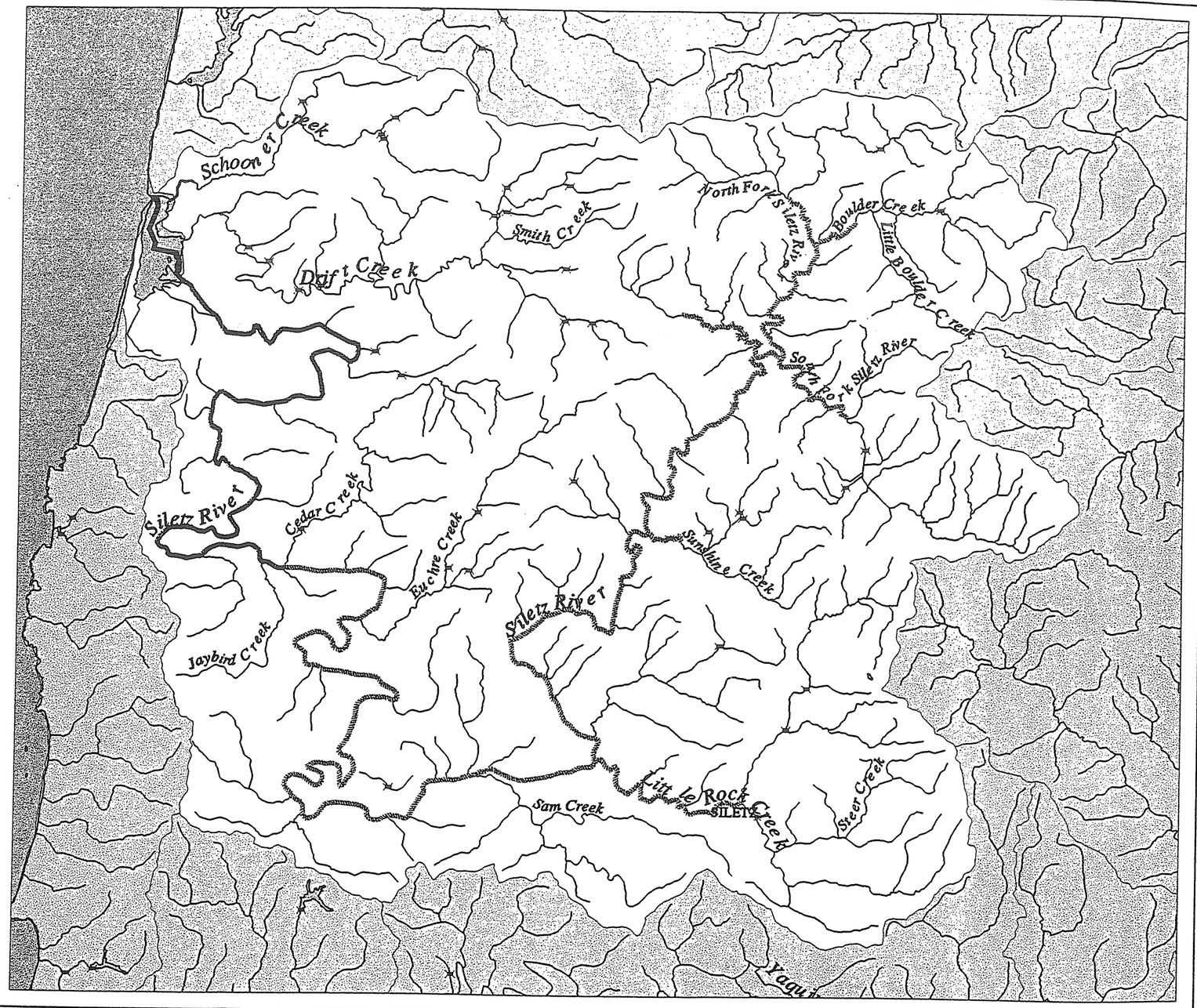
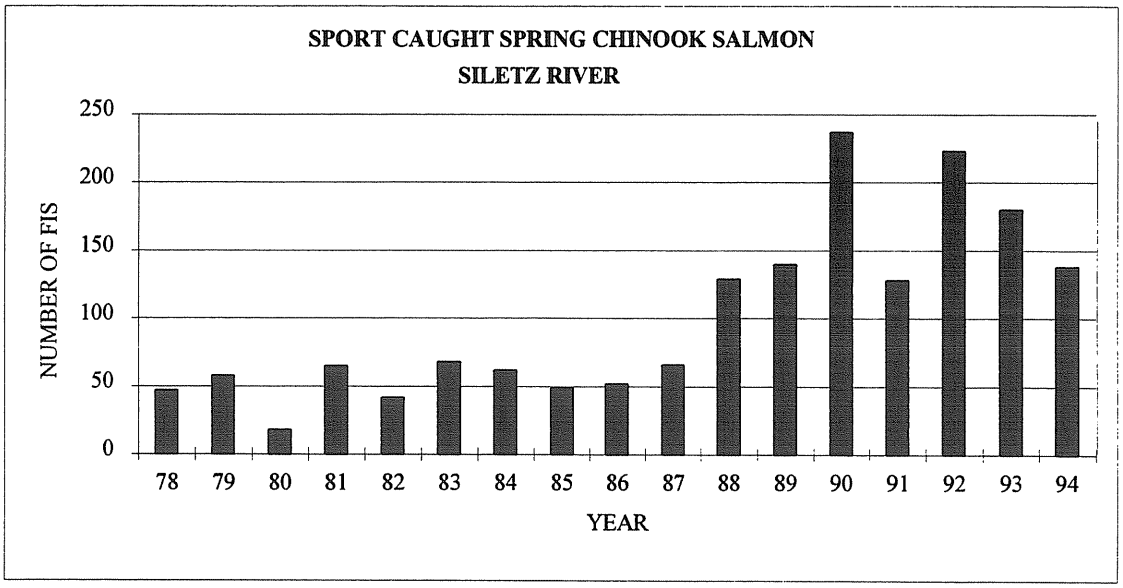


Figure 14. Sport caught spring chinook salmon, Siletz River Basin.



The harvest of spring chinook in any area of the Siletz River Basin may not be justified given the apparent depressed status of this run. Regulation changes that prohibit the retention of chinook prior to the start of the fall chinook run should be considered.

Management Considerations

Spring chinook salmon in the Siletz River Basin will be managed for wild production only. Spring chinook runs appear to be self-sustaining but at a low level. Habitat factors that limit spring chinook production in the Siletz River Basin are not well understood. Achieving habitat objectives outlined in the Habitat chapter may enhance the productivity of spring chinook salmon.

The harvest of spring chinook in any area of the Siletz River Basin may not be justified given the apparent status of the run. Improved information on population size is needed to assess the appropriateness of existing angling regulations. The spring chinook population in the basin may be able to sustain some level of consumptive harvest in the future, as the population increases, or information becomes available to document that existing population levels are adequate.

Policies

Policy 1. Spring chinook in the Siletz River Basin shall be managed for wild production only, except for hatchery programs specifically designed to assist recovery of the wild population.

Objectives

Objective 1. Achieve an annual spring chinook escapement of at least 300 adults with population components in both the lower and upper parts of the basin.

Assumptions and Rationale

1. Extensive surveys of spring chinook spawners will provide a basis to estimate run size and to identify survey sections for monitoring escapement trends.

2. Fall chinook inhabit the same adult spawning and juvenile rearing areas. Spring chinook in the Siletz River Basin will be able to persist in the system in the face of large fall chinook runs.

3. Achieving habitat protection objectives will provide the habitat needed to support a self-sustaining wild spring chinook population.

Actions

1.1 Develop and implement surveys for spawning spring chinook in likely habitats within the basin. Based on findings in comprehensive surveys, refine escapement objectives as warranted and adjust annual trend surveys to provide a representative sample of the overall spawning population.

1.2 Propose angling regulations modifications to reduce targeted spring chinook harvest during the bi-annual regulation setting process, if warranted, based on expanded monitoring.

1.3 Accomplish basin habitat protection and restoration objectives.

Objective 2. Achieve an in-river harvest of at least 50 spring chinook annually if the population exceeds 300 spawners and is documented to be secure.

Assumptions and Rationale

1. The Siletz River Basin consistently produced an angler harvest of at least 50 spring chinook since 1981.

Actions

2.1 Refine spring chinook angling in the Siletz River Basin based on expanded monitoring.

COHO SALMON

Background

The Siletz River Basin contains an important wild coho run and is stocked with hatchery coho that are produced at Salmon River Hatchery. Coho salmon are widely distributed in low and medium gradient tributary streams throughout the basin below Siletz Falls (river mile 64.5) (Figure 15). Coho salmon are no longer allowed to pass through the fish ladder at Siletz Falls beginning in 1994-95. This action was taken to allow summer steelhead primary use of habitat above the falls.

Status

Wild coho are currently a major conservation concern over the entire Oregon Coast. Siletz River Basin wild coho are one of the most severely depressed Oregon coastal populations.

Indicators of historic coho runs to the Siletz include an average catch in commercial fisheries of about 17,000 during 1923-1940 (Figure 16, Mullen 1981). This catch probably equates to a total return of at least 50,000 adults. A study on Siletz River coho salmon estimated the 1954 run size at about 18,000 adults (Morgan 1964). These indicators of historic population size both point toward a progressive decline to the very depressed state of Siletz River coho salmon today.

Figure 16. Number of coho harvested in commercial fisheries on the Siletz River from 1896 to 1956 (Mullen 1981).

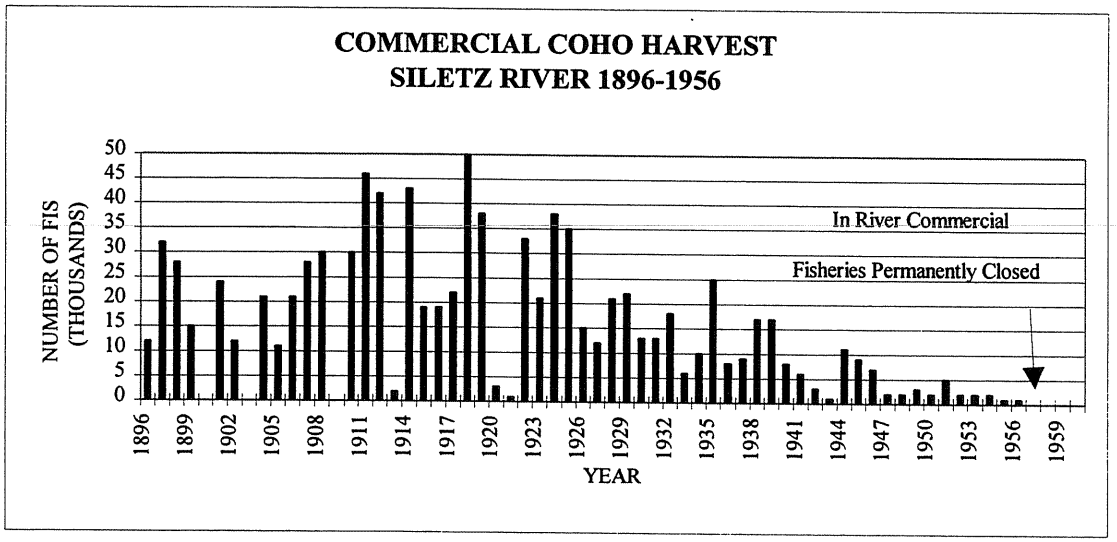


Figure 15. Distribution of Coho Salmon in the Siletz River Basin

COHO DISTRIBUTION SILETZ RIVER BASIN

Spawning & Rearing

Rearing Only

Migration Routes & Fish Presence

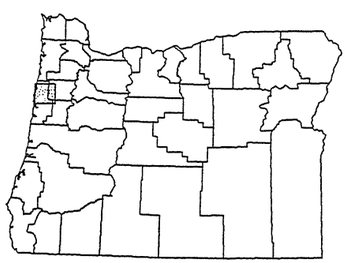
Fish Hatchery

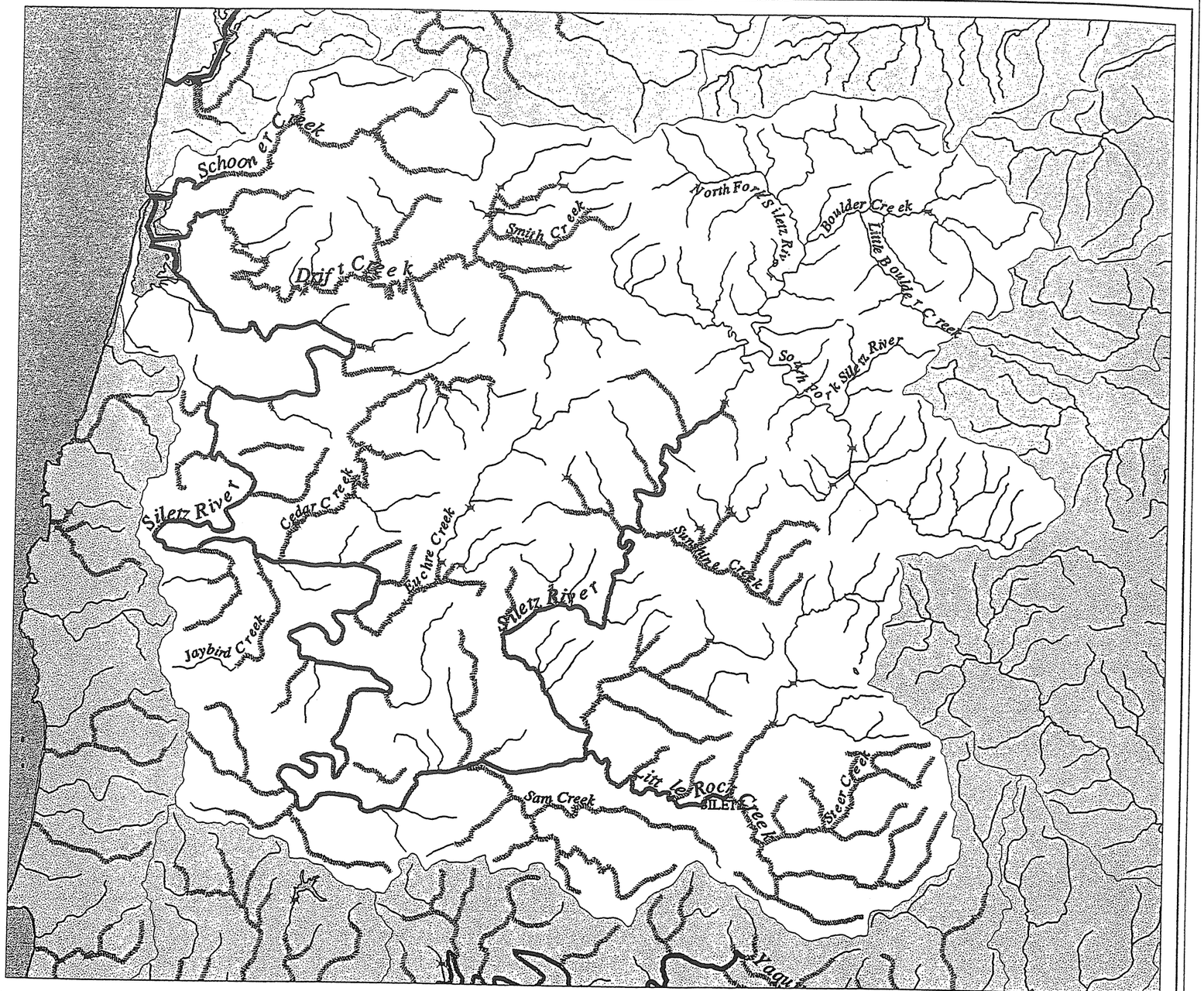
Barrier to Migration

MI
0 1 2 3 4

OREGON
Fish & Wildlife

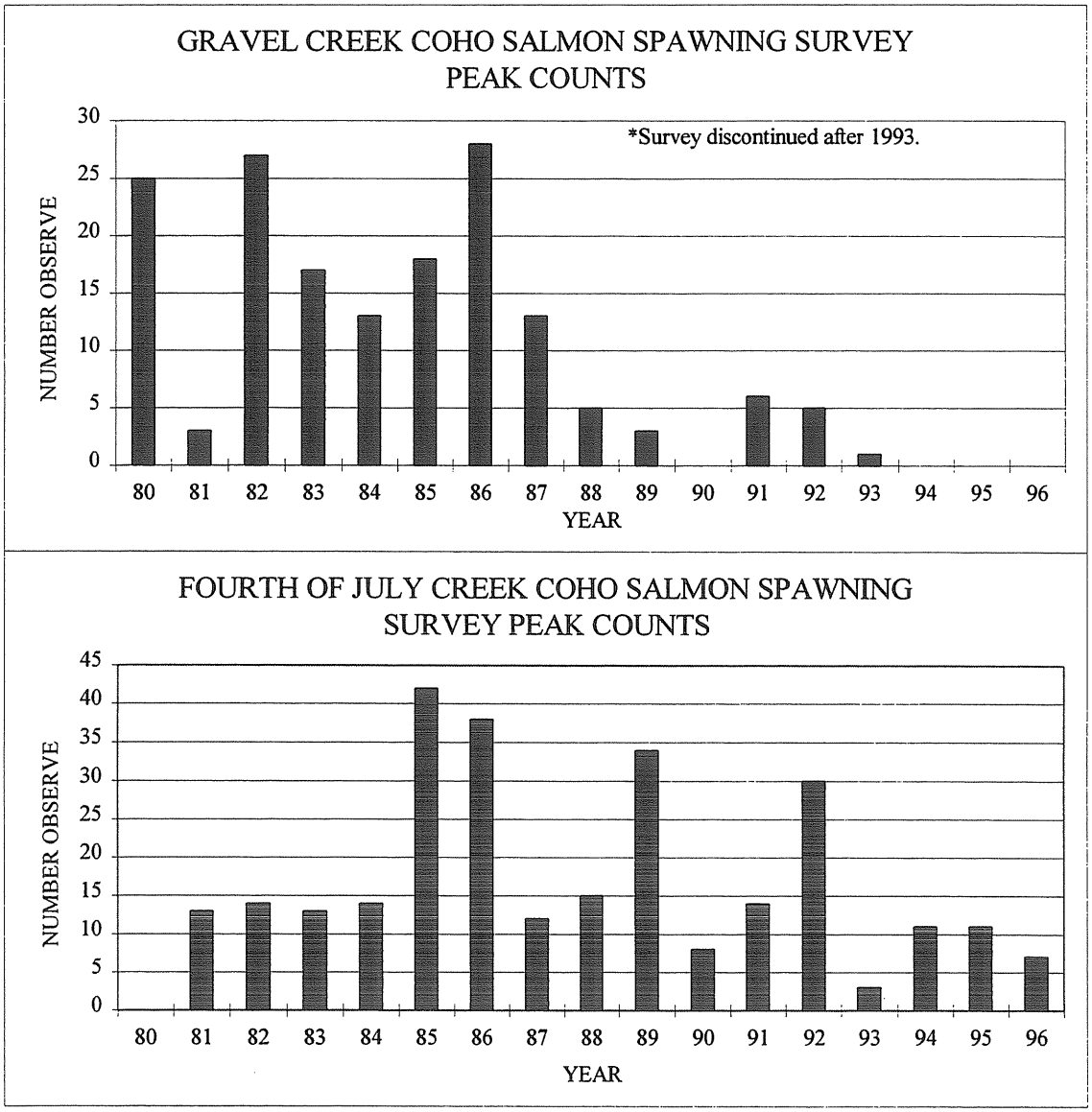
Location





There are two spawning surveys in the Siletz River Basin that have been used to evaluate trends in coho salmon spawning escapement (Figure 17). Both sites are located in the upper basin. Gravel Creek is located above Siletz Falls so coho salmon are not being allowed access to the area as part of summer steelhead recovery efforts. Gravel Creek was stocked with hatchery coho during the early 1980s. The apparent decline in abundance shown in figure 17 indicates that hatchery releases were not successful in supplementing wild production.

Figure 17. Coho spawning ground surveys peak counts, Siletz River Basin.



The second Siletz coho trend survey in Fourth of July Creek does not show any indication of increased or decreased escapement since 1980. During this time period, it is thought that conditions effecting coho smolt survival have deteriorated. Reduced survival of coho salmon smolts has been offset by more restrictive constraints on fisheries resulting in the apparent stable

trend. However, the presence of only a single coho trend survey makes any conclusion uncertain.

The Siletz River Basin has an estimated 125 miles of potentially high production coho spawning habitat below Siletz Falls (Cooney and Jacobs, 1994). Based on random spawning surveys within the estimated 125 miles of high potential coho habitat, the Siletz River Basin has had an estimated annual average of 944 naturally produced coho spawners from 1990-96 (Table 17). There is no apparent trend in abundance over this time period. During this same time period, wild coho salmon production has increased substantially in the Yaquina Basin located about 20 miles to the south. This increase in the adjacent Yaquina Basin where freshwater habitat is generally similar to the Siletz, suggests that Siletz River Basin wild coho are impacted by additional sources of mortality. It is hypothesized that this mortality may occur due to heavy predation or competition with hatchery fish in Siletz Bay (see Alsea River Basin Plan for further discussion).

Table 17. Estimated spawning escapement of naturally produced coho salmon based on randomized spawning area surveys. Assumes 118 miles of habitat.

Year	Miles surveyed	Fish/Mile	Est. total population
1990	9.32	3.7	441
1991	8.52	8.3	984
1992	10.55	20.7	2447
1993	12.57	3.4	400
1994	7.78	10.2	967
1995	8.5	5.1	607
1996*	12.3	6.5	763

*1996 coho population estimate will be subject to revision following further analysis.

Wild coho in the Siletz River Basin have been influenced by hatchery strays both from the private hatchery at Newport prior to the time it went out of business, and from the ODFW hatchery program in the Siletz River Basin (Table 18). The proportion of strays from ODFW hatchery releases within the basin (about 44%) is higher than the 10% level allowed by the Wild Fish Management Policy for hatchery stocks that are not similar to the wild stock. Surveys have not been conducted specifically to determine levels of hatchery straying, so this estimate should be considered to be a rough approximation.

Better information on Siletz River Basin coho will be extremely beneficial if recovery of these fish are to be achieved. Specific inventory needs include comprehensive surveys of rearing juveniles and trend surveys of spawning adults that are more representative of the basin's overall coho production.

Table 18. Origin of adult coho recovered in natural spawning areas in the Siletz River Basin based on analysis of scale samples.

	Number of fish		
Year	Wild	Public hatchery	Private hatchery
1985	56	6	4
1986	55	45	23
1987	10	6	2
1988	27	10	0
1989	38	14	3
1990	5	6	21
1991	36	105	1
1992	27	20	0
1993	0	21	0
1994	2	8	0
1995	0	2	0
Total	218	243	54

Life History Characteristics and Habitat Needs

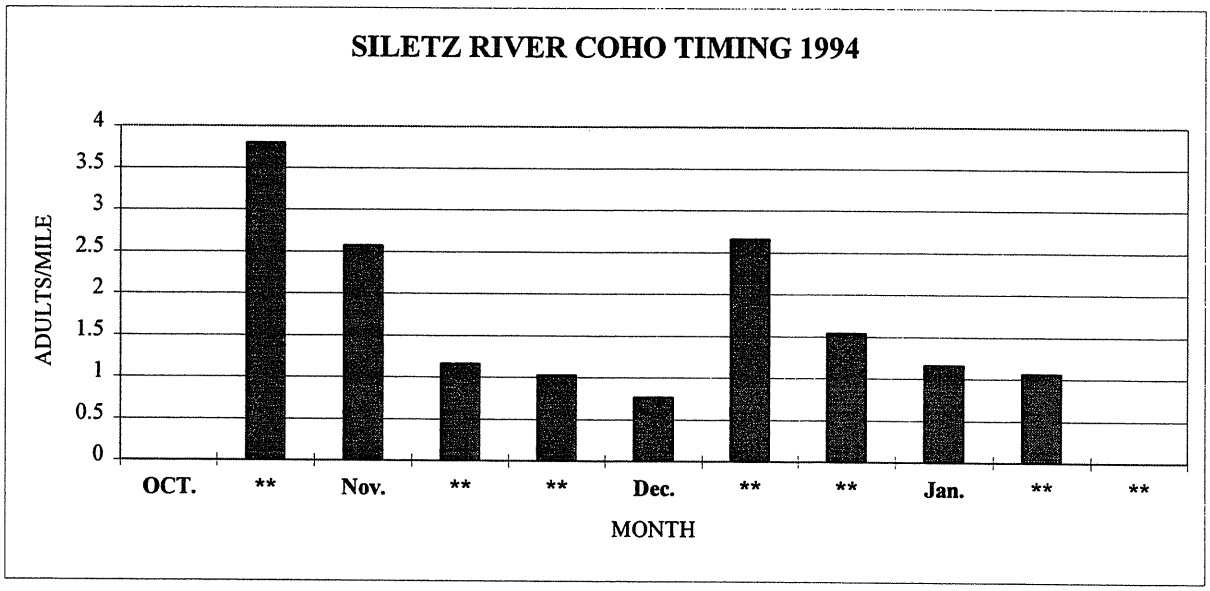
Coho smolts migrate to the ocean in the spring after rearing one year in freshwater. After the first summer in the ocean, a small proportion of the males attain sexual maturity and return to spawn as 2 year old jacks. Most of the coho remain an additional year at sea before returning to freshwater to spawn at age 3 and an average size of about 8 pounds.

Coho salmon return to spawn in the Siletz River Basin primarily from September through November. Spawning occurs in tributary streams in November through February and tends to be bi-modal (Figure 18). The early spawning peak is thought to be dominated by hatchery spawners and their progeny, while the late peak is dominated by wild fish.

Fry emerge in the spring and rear in backwater areas and stream margins (Nickelson et al. 1992). During the summer, juvenile coho are spread through a variety of pool habitats. In the winter months, juvenile coho concentrate in pools such as beaver dams or alcoves that maintain low current velocity in spite of high stream flows (Figure 19). It is thought that coho productivity in many Oregon coastal streams is limited by the amount of protected pool habitats required by juveniles in winter months.

Excessive summer water temperatures (>70° F single day maximum) reduce use by juvenile coho salmon in some areas.

Figure 18. Adult coho spawning time 1994, Siletz River Basin.



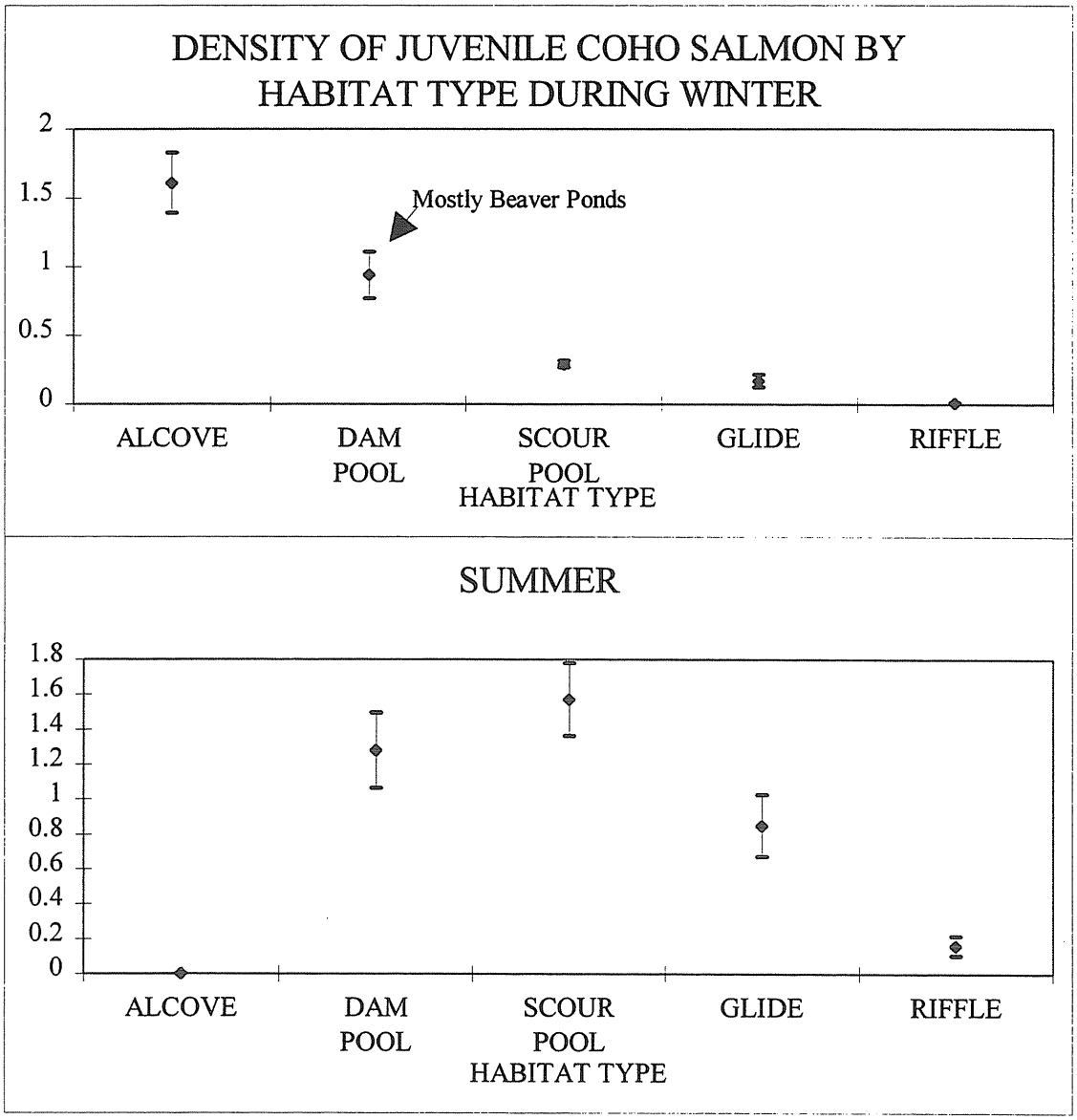
Habitat Restoration Activities

The highest priority for habitat restoration projects in the Siletz River Basin is coho salmon. Siletz coho are a high priority because of their current depressed status and because the potential for recovery is high, with restoration projects potentially playing a substantial role.

Recent research in central coast streams has demonstrated that habitat restoration can increase coho production by improving survival of juvenile coho salmon during the winter they spend in freshwater. Improved juvenile survival during the winter results from creating slack water pools with moderate water depth and cover. These habitat types can be developed by adding large woody material to the stream, stable beaver dams or construction of alcoves.

The first major habitat restoration project targeting Siletz River Basin coho salmon has been implemented in 1995 by Georgia Pacific in Mill Creek, a Siletz tributary near Logsden. This project includes the addition of substantial amounts of large woody material to several miles of stream. Further work in other Siletz tributaries is planned by Georgia Pacific and other landowners during upcoming years.

Figure 19. Coho salmon juvenile habitat use during winter and summer months.



Other Siletz River Basin coho habitat restoration projects have been identified in a mid coast guide to stream reaches suited to habitat restoration (Nicholas et al, 1995). This guide selects projects based on consideration of a variety of factors including presence of wild coho in the area, stream channel characteristics and landowner interest. Projects selected in this guide and by others target several situations where restoration would provide the highest benefits. These include the following restoration activities:

1. Correct culverts that impede upstream adult or juvenile passage to stream reaches that provide important habitat. These opportunities are limited, but benefits are very high.

2. Increase instream structure by using large woody debris in free flowing stream reaches. Observations of Siletz River tributaries indicate a general lack of instream structure. Increased instream structure will provide winter habitat, a likely factor limiting coho production. Instream structure should be placed in stream reaches in low gradient floodplain areas to get the most benefit. These sites could be identified from stream habitat surveys, topographic maps and field observations. Several projects of this type have been recently completed in the Siletz River Basin including a large effort by Georgia Pacific over several miles in the Mill Creek sub-basin near Logsden.

3. Beaver activity and the development of beaver dams are different methods of providing the protected pool habitat that is essential for juvenile coho during the winter. Beaver activity is particularly beneficial in medium size (~400 to ~2,000 acre drainage) low gradient streams where beaver dams do not wash out during the winter. Management for stable beaver populations can be very beneficial to coho recovery in these selected stream reaches. Activities to allow stable beaver populations in these areas may include avoiding silviculture prescriptions that created the necessity for beaver removal and modifying or replacing culverts that are chronically plugged by beavers as an alternative to beaver removal.

4. Sedimentation control by waterbarring and/or decommissioning roads.

Hatchery Production

The hatchery coho salmon allocation for the Siletz River Basin has been reduced from 800,000 smolts annually to a release of 50,000 at Siletz tribal fishing sites on Euchre and Rock Creek. The ODFW Commission approved this reduction in 1994 as part of the strategies for the Wild Fish Management Policy implementation in coastal areas.

The primary purpose of the Siletz River Basin hatchery coho program that existed through 1994 was to supplement ocean fisheries. Other purposes were to contribute to the in-river sport fishery and the Siletz Indian Cultural Fishery. The Siletz coho hatchery production has been produced at Salmon River Hatchery since the hatchery on Rock Creek was closed in the late 1980's. Half of the 800,000 smolt release was trucked from Salmon River to the old Rock Creek Hatchery site while the other 400,000 were released directly into the lower mainstem Siletz or Euchre Creek.

Angling and Harvest

Siletz River Basin coho salmon contribute primarily to ocean fisheries from the central Oregon coast to northern California. The overall exploitation rate on coho has averaged about 80% from 1970-83 and 50% from 1983-93. During 1994-97 directed ocean fisheries were essentially closed.

Harvest of coho in the Siletz River Basin in-river sport fishery has averaged about 500 wild and hatchery adults in recent years prior to the closure of the fishery.

The Siletz Indians are allowed to catch up to 200 salmon annually at fishing sites on Euchre Creek, Dewey Creek and Rock Creek. Hatchery coho are stocked in Euchre and Rock Creek to help provide for these fisheries. The actual annual harvest is usually substantially less than 200 salmon because of low water conditions in early November, varying run size, and fishing effort (Table 19). ODFW will continue to work with the Siletz Tribe to provide a fishery.

Table 19. Reported salmon harvest in the Confederated Tribes of the Siletz Indians cultural fishery in the Siletz River Basin.

Year	Salmon tags issued	Reported salmon harvest
1982	197	35
1983	125	4
1984	200	21
1985	183	18
1986	183	43
1987	113	3
1988	143	34
1989	190	25
1990	200	9
1991	200	29
1992	200	21
1993	188	6
1994	NA	
1995	200	7

Coho Spawner Goals

The ODFW Coho Plan gives direction that coho salmon in Oregon coastal streams will be primarily managed to maximize natural production (ODFW, 1982). This intent was maintained in the recently completed Oregon Plan. The Oregon Plan included refined analysis of adult coho spawner abundance required to maximize use of freshwater habitat by juvenile coho salmon. This refined analysis is used in this plan. It estimates spawners needed for each major coastal basin based on habitat surveys from that specific basin and recognizes that marine survival of coho smolts influenced spawner requirements. During low marine survival, spawner requirements were reduced because wild coho would not be viable in lower quality habitat. Conversely, if marine survival improved, this improved marine survival would compensate for low quality freshwater habitat, resulting in wild coho viability over a much broader area and a need for more overall spawners in a basin. Because of the influence of marine survival, wild coho spawner abundance targets are presented as a range.

An estimated 4,300 to 7,400 adult coho spawners are required for near complete utilization of Siletz River Basin freshwater habitat. The lower and higher values correspond to spawners needed with low and moderate marine survival respectively. It is recognized that there will be high variability in escapement among different stream reaches and between years. Some areas will have more spawners because they contain concentrations of spawning gravel or because they are associated with above average rearing habitat. Other areas will have fewer because they have rearing habitat with a lower capacity, or in some cases adult returns will be below levels needed for full seeding because of low survival from the egg to smolt stage. Full seeding in most streams, most years, is the expectation if the adult spawner targets are realized.

This spawning escapement objective is five to eight times higher than escapement observed in recent years.

This Siletz River Basin escapement objective will be a consideration, but not a singular constraint on mixed stock ocean fisheries. Selective ocean fisheries for fin clipped hatchery coho will be an option by 1998. These fisheries could potentially occur based on achievement of spawner targets for each of three Oregon coastal wild coho population sub aggregates. These fisheries would also require that all major basins including the Siletz do not constitute a severe conservation problem.

Fisheries within the Siletz will be managed dependent on progress in achieving wild coho production and escapement increases (Table 20).

A freshwater juvenile abundance objective of 1.5 juvenile coho salmon per square meter of pool habitat is also proposed. A density of 1.5 coho/m2 is generally considered to be an approximate density indicative of full juvenile seeding. At higher densities, territorial conflicts occur among the juveniles and some fish are pushed out. The juvenile objective will serve as a check on habitat quality and appropriateness of the adult escapement objective. It will be measured during late summer in surveys for multiple salmonid species in tributary streams.

Table 20. Coho management strategies

Situation	In-basin fishery management
Wild coho escapement decreases or remains at very depressed levels in recent years.	Any fishing mortality will be undesirable. Fisheries on other species may be modified to prevent incidental wild coho hooking mortality.
Wild coho escapement increases, but is less than 4,300 adult spawners.	Efforts made to allow reasonable utilization of still healthy species like fall chinook or finclipped steelhead.
Wild coho adult spawners are expected to meet or exceed 4,300 adults.	Initiate a process to open in-basin fisheries on wild coho salmon.

Management Considerations

Coho salmon in the Siletz River Basin will be managed for wild and hatchery production. The current limited hatchery program to primarily provide for the Siletz Indian cultural fishery, will be maintained. This hatchery coho program will be developed so it is in compliance with the Wild Fish Management Policy. Coho will be prevented access above Siletz Falls to protect summer steelhead. Annual surveys of adult and juvenile coho will be conducted to measure success at achieving objectives. A high priority will be given to protecting and restoring coho habitat. A short term fishery objective will be to avoid constraints on fisheries for other healthy species due to incidental wild coho hooking mortality. A longer term fishery objective will be to return to consumptive fisheries on wild coho.

Policies

Policy 1. The Siletz River Basin shall be managed for production of both wild and hatchery coho salmon.

Policy 2. Coho hatchery stocks that can be used in the Siletz River Basin are limited to the existing Siletz hatchery stock or a broodstock developed from native Siletz coho.

Objectives

Objective 1. Achieve an annual benchmark for wild coho spawning escapement in the Siletz River Basin of 4,300 adult coho salmon during poor marine survival conditions, and 7,400 adults under more moderate conditions.

Assumptions and Rationale

1. This escapement goal is consistent with estimates of spawners needed to fully utilize freshwater habitat with moderate smolt survival.

2. The Siletz River Basin adult coho escapement objective may be modified due to new technical information and analysis or due to coast wide review of coho escapement objectives.

3. Coho salmon in the Siletz River Basin are severely depressed from historic levels.

4. Siletz River Basin wild coho status will be considered in ocean fisheries based on the harvest management procedure established in the Oregon Plan.

5. Incidental wild coho mortality in fisheries targeting other species (chinook, hatchery steelhead) will be acceptable if progress is being made at building toward the escapement objective.

6. The absence of instream habitat complexity created by large woody material, and the lack of large conifers in riparian areas necessitate that large woody structure be artificially placed in some stream reaches to provide productive coho habitat.

7. Beaver populations will continue to provide habitat that is essential for over-winter survival of juvenile coho salmon in some stream reaches.

8. Reductions in hatchery coho smolt releases in the Siletz River Basin from 800,000 to 50,000 annually may result in substantial improvement in wild coho smolt survival.

9. Coho salmon have been prevented from accessing areas above Siletz Falls (river mile 64.5) as part of recovery efforts for wild summer steelhead.

0. The production level that Siletz River Basin coho salmon will achieve given improved habitat conditions, reduced interaction with hatchery fish, and adequate fishery escapement cannot be accurately predicted. Given that the Siletz River Basin currently has coho production that is less than 5% of historic levels, it is probable that substantial recovery can be achieved.

Actions

1.1 Continue to monitor spawner abundance annually in randomized survey areas and in the single standard trend survey area in the Siletz River Basin.

1.2 Maintain the annual 50,000 hatchery coho smolt release within the Siletz River Basin to provide fish for the Siletz Tribal cultural fishery.

1.3 Restrict all recreational angling for coho salmon within the Siletz River Basin until spawner abundance increases substantially (note objective 3).

1.4 Potentially develop a small conservation hatchery program by capturing and spawning limited numbers of wild adults, releasing their offspring into tributaries where wild coho are absent or present in extremely low levels.

1.5 Systematically survey likely coho habitat throughout the Siletz River Basin to assist in prioritizing protection and restoration needs and provide baseline information to evaluate the effectiveness of these efforts.

1.6 In review of land use activities, emphasize activities that may impact important habitats for coho salmon.

1.7 Implement habitat restoration projects designed primarily to increase coho production in collaboration with other agencies and land managers.

1.8 Recommend to landowners that beavers be managed so habitat benefits for coho salmon are achieved.

Objective 2. Achieve an average summer juvenile coho salmon seeding level of at least 1.5 fish per meter squared of pool habitat in streams suitable for coho production.

Assumptions and Rationale

1. Juvenile coho densities averaging 1.5 fish per meter squared of pool habitat are indicative of full habitat utilization.

2. An adult spawning escapement of 4,300 to 7,400, as stated in Objective 1, should achieve summer juvenile rearing densities of 1.5 fish per meter squared of pool habitat.

3. Initially, the juvenile coho density objective will be applied to the 125 miles of stream habitat identified as high potential adult coho spawning habitat. This estimate will be refined based on new information.

Actions

2.1 Conduct annual surveys of juvenile coho salmon to determine density and distribution in the basin.

2.2 Based on the results from coho adult spawning surveys and juvenile surveys, evaluate the appropriateness of the adult spawner goal and refine if warranted.

2.3 If coho juveniles are less abundant than 1.5 fish per meter squared given adequate spawning escapement, evaluate habitat limitations and correct deficiencies if feasible.

2.4 Promote the evaluation of coho salmon population dynamics by using fish traps to measure the smolt production and subsequent adult coho returns from representative sub-basins. Develop the evaluation to improve understanding of post tributary coho smolt survival and the relationship between smolt production and habitat conditions or adult escapement levels.

Objective 3. Recover Siletz River Basin wild coho salmon sufficiently to prevent restrictions on fisheries targeting other species or fin clipped hatchery coho, and sufficiently to provide for future harvest in the Siletz River Basin.

Assumptions and Rationale

1. Resumption of coho fisheries will be dependent on recovery of Siletz River Basin wild coho salmon.

2. Fisheries for coho salmon in the Siletz River Basin may occur on wild coho or fin clipped hatchery coho.

Actions

3.1 Consider opening fisheries for wild coho salmon in the Siletz River Basin if wild coho spawner abundance is anticipated to be at least 4,300 adults as measured in random spawning surveys.

3.2 Consider opening the Siletz River Basin to angling for fin clipped hatchery coho if criteria within the Oregon Plan are achieved for harvest of fin clipped hatchery coho.

Objective 4. Cooperate with the Siletz Tribe in developing a mutually acceptable fishery based on provisions in the Agreement (US Public Law 96-340).

Assumptions and Rationale

1. An agreement between the State of Oregon and the Confederated Tribes of Siletz Indians defines tribal fishing rights and the cultural fishery in the Siletz River Basin. This plan will be consistent with the agreement.

2. The agreement specifies that Siletz Tribal Cultural fisheries shall be allowed at three sites on tributaries to the Siletz River with a harvest of up to 200 salmon annually.

3. The agreement specifies that ODFW shall manage and where appropriate enhance the salmon resource in each designated stream consistent with sound principles of fisheries science.

Actions

4.1 On streams with tribal fishing sites, manage and, if necessary, restore habitat to enhance the tribal fishery. Use hatchery fish as an enhancement option.

WINTER STEELHEAD

Background

Winter steelhead are native to all major basins along the Oregon coast, including the Siletz. Good production areas are found in large, high gradient streams with cool summer water temperatures.

Important habitat for winter steelhead is not well documented. It is thought that primary areas are the mainstem Siletz River from Moonshine Park (river mile 52) to Siletz Falls (river mile 65) and larger high gradient tributaries including Schooner, Drift, Cedar, Euchre and Sunshine creeks.

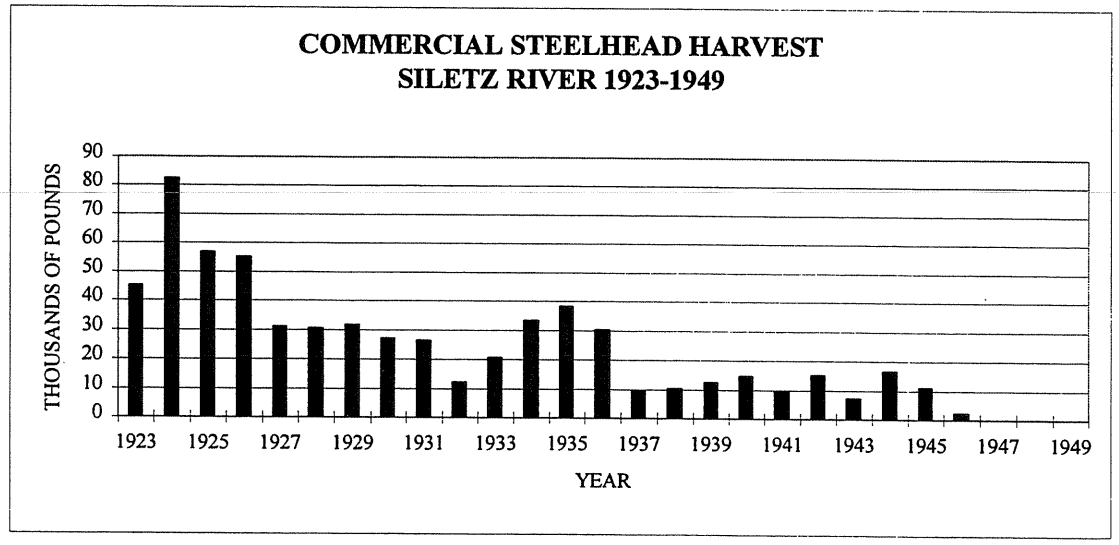
The Siletz River Basin has been consistently stocked with Alsea stock hatchery winter steelhead since the mid-1960s.

Status

Wild winter steelhead in the Siletz River Basin are depressed and are currently being reviewed along with other coastal steelhead for listing under the Endangered Species Act.

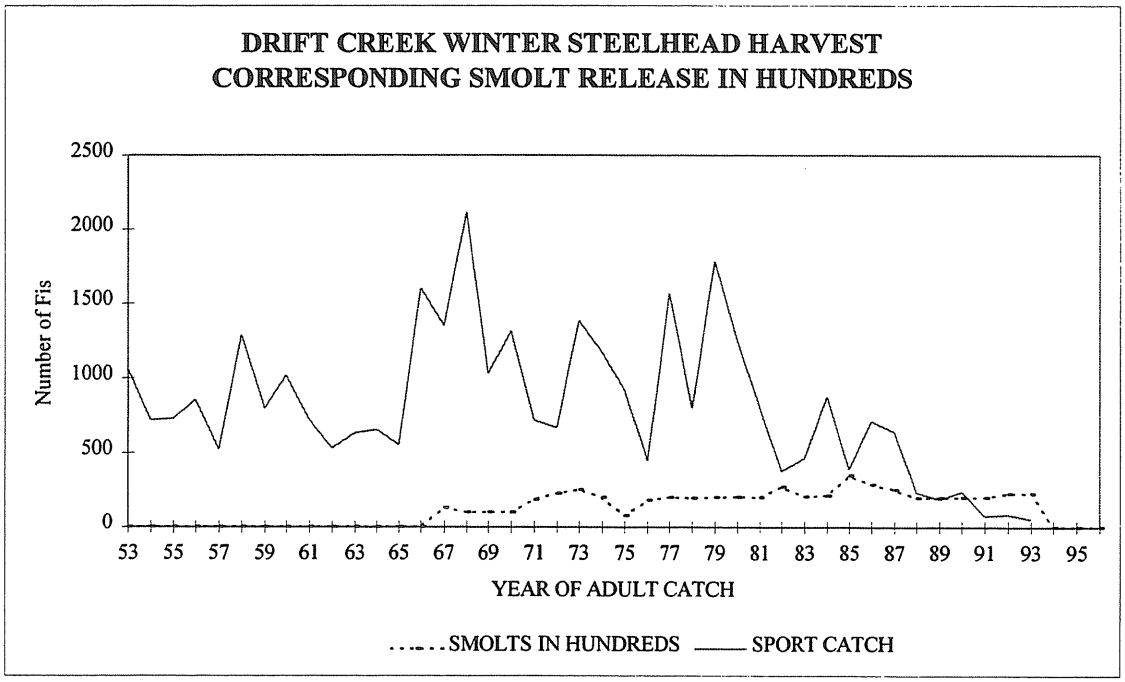
Commercial net fisheries provide the earliest record of Siletz winter steelhead run sizes. From 1923-40 catch averaged about 3,500 fish per year (Figure 20). It is uncertain what proportion of the run was caught in the commercial fishery. The total run size was probably at least twice and perhaps several times larger than the observed catch.

Figure 20. Catch of winter steelhead in commercial fisheries on the Siletz River from 1923 to 1948.



The best indicator of the current status of Siletz wild winter steelhead is the estimated catch of winter steelhead from the 1950's to the present based on angler catch cards or punchcards (Figure 21 and 22). This information indicates that total catch in recent years is about the same as total catch in the 1950's and early 1960's prior to any hatchery program. Since hatchery fish currently make up about three quarters of the catch (Table 21), this indicates a substantial decline in catch of wild fish. It is thought the reduced catch of wild fish is indicative of a comparable reduction in abundance. The situation is aggravated because many of the wild or naturally produced steelhead in recent years are in all probability progeny of Alsea hatchery stock rather than native stock.

Figure 21. Winter steelhead catch estimates from punchcards and corresponding smolt releases, Drift Creek.



Factors that potentially contributed to the decline in wild winter steelhead include;

1. Unfavorable ocean conditions for smolt survival in recent years.
2. Increased predation by marine mammals or birds.
3. Past high seas net fisheries.
4. Excessive in-river sport harvest.
5. Freshwater habitat deterioration.
6. Genetic alteration of wild steelhead due to breeding with hatchery steelhead.
7. Competition in freshwater with juveniles from hatchery spawners.

Figure 22. Winter steelhead catch estimates from punchcards and corresponding smolt releases, Siletz River.

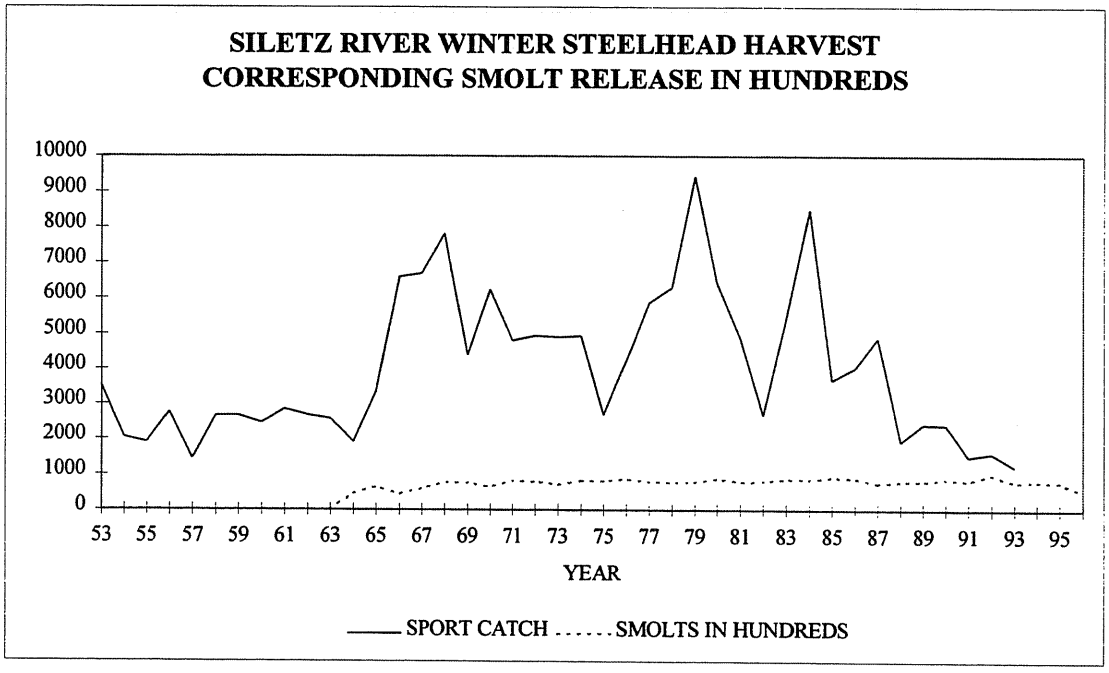


Table 21. Origin of winter steelhead caught in Drift Creek and the Siletz River Basin based on analysis of scale samples.

	Numbers of fish			
	Drift Creek		Siletz River	
Run Year	Hatchery	Wild	Hatchery	Wild
1983-84	9	3	161	51
1984-85	11	6	81	22
1985-86	12	9	69	13
1986-87	3	1	52	34
1987-88	15	6	85	24
1988-89	1	0	12	10
1989-90	0	0	80	16
1990-91	3	0	58	37
1991-92	0	0	60	9
Total	54	25	658	216
% of Total	68%	32%	75%	25%

Life History Characteristics and Habitat Needs

Winter steelhead generally return to freshwater to spawn beginning in November, with the majority returning in January through March. Spawning of wild fish is thought to occur in the mainstem Siletz River and tributary streams primarily during February through May.

Generally, after 2 years of freshwater residence, juveniles smolt and migrate to the ocean in the spring. Steelhead most commonly remain in the ocean two years before returning to freshwater to spawn, although about a third of the returns will be comprised of older or younger age fish , or repeat spawners.

Compared to other salmonids in the basin, juvenile steelhead prefer stream reaches with high gradient and velocity. Young-of-the-year fry are usually found along the edges of pools or riffles, while older juveniles are in the main current in deeper pools and pocket water (Barnhart 1986). Yearling steelhead juveniles require enough cover to avoid predation and enough current velocity to supply drifting food items. Yearling and adult steelhead often use white water and turbulence as cover.

Large woody debris is an important component in steelhead habitat in some areas, both from the standpoint of serving as cover and of creating pools. In other areas, rock based structure creates instream channel complexity required by juvenile steelhead.

Habitat Restoration Activities

Extensive habitat restoration activities directed specifically at winter steelhead have not been given a high priority in the Siletz River Basin at this time because of the limited ability to improve habitat in the large, high gradient streams normally used by steelhead. At present, these areas frequently have habitat in fair condition due to cover provided by large instream rocky structure. Habitat restoration projects could be carried out in critical steelhead spawning and rearing habitats. Potential restoration projects could include;

1. In large streams, creating an edge effect with large woody debris and boulders to provide cover from predators and high winter flows.
2. In small or medium steelhead streams, using large wood or boulders throughout the channel to create cover, scour pools etc..
3. Improving shading along streams to maintain or decrease summer water temperatures.

Hatchery Production

The Siletz River Basin has been stocked with Alsea hatchery stock winter steelhead for the purpose of contributing to in-river steelhead fisheries. The annual target release number for the Siletz mainstem has been 80,000 smolts at a size of six fish per pound (Table 22). Drift Creek has received an additional 20,000 smolts.

Table 22. Winter steelhead smolts released in the Siletz River Basin. All releases are Alsea Hatchery strain except as noted.

Year	Number Stocked Siletz River	Drift Creek
1964	45,048	0
1965	63,959	0
1966	43,733	13,000
1967	59,719	10,004
1968	75,700	10,000
1969	75,000	10,000
1970	64,400	18,300
1971	81,330	22,500
1972	78,600	25,000
1973	70,018	20,012
1974	81,860	7,760
1975	80,455	18,000
1976	86,930	20,000
1977	78,539	19,594
1978	76,995	20,007
1979	77,655	20,203
1980	87,814	20,088
1981	78,933	26,996
1982	79,924	20,535
1983	87,367	21,171
1984	83,903	34,637
1985	91,078	28,837
1986	89,067	25,041
1987	73,310	19,871
1988	79,762	19,799
1989	80,023	20,034
1990	87,029	20,000
1991	82,474	20,021
1992	100,458	20,022
1993	78,641	22,528
1994	79,940	0
1995	78,605	0
1996	50,000(Native Stock)	0
1997	50,000(Native Stock)	0

Returns from the hatchery program have declined over the years based on the decline in angler harvest of hatchery fish. Factors that could potentially be responsible for declines in hatchery smolt survival include;

1. Unfavorable ocean conditions for smolt survival in recent years.
2. Increased predation by marine mammals or birds.
3. Past high seas net fisheries.
4. Deterioration in the genetic fitness of the Alsea hatchery stock.
5. Increases in disease organisms in the hatchery environment or decreased resistance of hatchery fish to disease organisms present in the natural environment.

The winter steelhead hatchery program that used Alsea hatchery fish was out of compliance with protection standards for wild fish. In February 1994, the ODFW Commission approved strategies to achieve Wild Fish Management Policy compliance. These strategies include discontinuing use of the Alsea stock in the Siletz River Basin and development of a hatchery brood stock from the Siletz River naturally produced steelhead. These fish will be released from a smolt acclimation and adult recapture facility located on Palmer Creek, a tributary near Moonshine Park. Initial smolt releases will be held at 50,000. Smolt release numbers could be adjusted as necessary to keep the proportion of hatchery fish (including both summer and winter stocks) spawning in the wild to 10% or less except in the immediate vicinity of the release location.

Smolt releases in Drift Creek were discontinued at least until enough information becomes available to substantiate that a new hatchery program using native fish can be developed without compromising the wild run.

Angling and Harvest

The Siletz River Basin has a variety of high quality winter steelhead angling opportunities. These include plunking along the lower mainstem, driftboat fisheries from the head of tidewater to Moonshine Park and bank fisheries in the gorge, Drift and Schooner Creeks. Total angler days provided by these fisheries have not been directly measured. They are approximated at about 10,000 angler days per year based on a recent average catch of about 2,000 fish and five angler days per fish.

Winter steelhead catch in the Siletz River Basin increased when hatchery programs were brought on line in the 1960's (Figure 21 and 22), but has declined to levels about the same as before the hatchery programs were started. The composition of steelhead in the angler catch since 1982 has been about 32% wild and 68% hatchery fish in Drift Creek and 25% wild and 75% hatchery fish in the Siletz River (Table 21).

Current angling regulations state that all non-fin clipped steelhead must be released. This has probably reduced angler mortality of wild fish from about 40% to 5-10%.

Management Considerations

Winter steelhead in the Siletz River Basin will be managed for wild and hatchery production. The depressed status of wild fish will be addressed by protecting and restoring habitat, continuing selective fisheries for fin clipped hatchery fish, and modifying the hatchery program to achieve compliance with the WFMP. A hatchery program will provide for a consumptive harvest in the mainstem Siletz. Recent modifications to the hatchery program will be continued. These modifications include switching to a native Siletz broodstock, reducing smolt releases from 80 to 50 thousand, and capturing and removing most hatchery adults not caught in the fishery from the river at a tributary acclimation facility near Moonshine Park.

In Drift Creek, all hatchery smolt releases have been terminated. Hatchery releases were discontinued because of the apparent depressed status of the wild run and concern over impacts from Alsea stock hatchery steelhead. This program has not been switched to a replacement wild brood because of uncertainty about status of Drift Creek wild steelhead and difficulty in establishing a hatchery program that is compatible with wild steelhead recovery in such a small basin. In the future, the option will be left open to re-establishing a hatchery steelhead program if wild steelhead are documented to be secure and a plan can be developed to capture wild brood fish, raise and acclimate smolts, and re-capture adults upon return. Fisheries targeting wild steelhead are a second option that will be maintained to provide consumptive steelhead harvest in Drift Creek. This option will be considered in the future if wild steelhead are documented to be secure, and the public desires consumptive harvest.

Policies

Policy 1. Winter steelhead in the Siletz River Basin shall be managed for wild and hatchery production.

Policy 2. Winter steelhead hatchery stocks that can be used in the Siletz River Basin are limited to a broodstock developed from naturally produced Siletz winter steelhead.

Objectives

Objective 1. Increase production of wild winter steelhead in the Siletz River Basin below Siletz Falls from present levels.

Assumptions and Rationale

1. Insufficient information is available to establish accurate production and escapement objectives for wild winter steelhead in the Siletz River Basin. If the Oregon Plan adopts interim escapement goals they will be used until sufficient information is available to establish accurate production and escapement objectives for the basin.

2. Accomplishing habitat protection and restoration objectives will improve stream conditions for winter steelhead and result in increased production.

3. Bringing mid-coast hatchery programs into compliance with the Wild Fish Management Policy will protect the genetic resources of wild winter steelhead in the basin and result in increased productivity.

4. Catch-and-release angling regulations for wild winter steelhead will increase escapement and production.

Actions

1.1 Accomplish the habitat management objectives in this plan.

1.2 When reviewing proposals for land use activities and development, give emphasis to important winter steelhead production areas.

1.3 Prevent passage of wild winter steelhead through the Siletz Falls fish ladder as part of summer steelhead recovery efforts.

1.4 Continue angling regulations requiring the release of all non-fin clipped naturally produced steelhead in the Siletz River Basin.

1.5 Reduce hatchery steelhead spawning in the wild to <10% of the total steelhead except in the immediate vicinity of the hatchery release site. Measures to accomplish this include reducing the number of stray hatchery fish from out-of-basin releases, reducing strays from in-basin releases and not releasing surplus hatchery fish into the wild.

Objective 2. Develop an information base and methodology for measuring and monitoring natural production of winter steelhead in the Siletz River Basin over the next five years.

Assumptions and Rationale

1. Comprehensive information on wild Siletz winter steelhead is not available.

2. Estimating escapement of wild steelhead using angler creel data may no longer be possible because of wild fish release regulations.

Actions

2.1 Implement adult winter steelhead spawning surveys in likely high use spawning areas.

2.2 Conduct inventories for juvenile steelhead in areas throughout the Siletz River Basin.

2.3 Establish standardized adult and/or juvenile surveys to measure trends in production of wild steelhead.

2.4 Make estimates of winter steelhead spawning escapement based on results from adult and juvenile surveys.

2.5 Compile steelhead inventory information annually and make it available to anyone who desires it.

2.6 Develop and implement evaluation of hatchery strays in natural spawning areas.

Objective 3. Provide an opportunity to catch an average of 1,500 hatchery winter steelhead in the Siletz River Basin.

Assumptions and Rationale

1. Punchcards will be the method used to estimate catch.

2. For hatchery steelhead smolts released in the Siletz River Basin, survival and fishery contribution will be intermediate between the 1970-85 period and the last 5 years.

3. During the 1970-85 time period, based on estimates from punchcards, an average of about 4.7% of the hatchery smolts released were caught in Siletz River Basin fisheries. During 1988-92 an average of 1.3% were caught.

4. It is anticipated that in the near future an average of 3.0% of the smolts released will be caught in Siletz River Basin fisheries.

Actions

3.1 Use naturally produced adult winter steelhead captured in the Siletz River Basin to raise 50,000 smolts.

3.2 Operate a smolt acclimation and adult return facility on Palmer Creek, a tributary adjacent to Moonshine Park.

3.3 Transfer the smolts to the acclimation facility at least one week prior to release.

3.4 Remove adult hatchery steelhead that return to the acclimation facility from the system to reduce hatchery fish from spawning in the wild. Transfer surplus hatchery steelhead to a reservoir fishery or explore other options for their use.

3.5 If hatchery strays comprise less than 10% of the total spawners in natural habitats in areas removed from the smolt release site and less than 30% of the overall steelhead spawning in the wild, consider increasing smolt releases. If hatchery strays comprise more than 10% of the natural spawners in areas removed from the smolt release site, or more than 30% of the overall steelhead spawning in the wild, decrease smolt releases or modify procedures.

3.6 Consistent with sound fish culture practices, modify the rearing or release strategies for Siletz winter steelhead smolts to increase smolt to adult survival. This may include modification of time or location of smolt release or modifications in practices at the hatchery or acclimation pond to improve smolt quality and survival.

3.7 At hatchery facilities handling the Siletz winter steelhead, provide necessary equipment or facility modifications to maintain a hatchery strain with the extended spawning time of the wild population.

3.8 Evaluate the feasibility of establishing a new hatchery broodstock from Drift Creek wild steelhead following inventory of the wild population.

Objective 4. Provide angling opportunities for wild winter steelhead in the Siletz River Basin.

Assumptions and Rationale

1. Catch-and-release angling opportunities will complement consumptive fisheries targeting hatchery steelhead in the mainstem Siletz River until wild fish recover sufficiently to allow a consumptive harvest.

Actions

4.1 Maintain angling regulations providing for catch-and-release fisheries for non-fin clipped steelhead in Drift Creek, Schooner Creek, and the mainstem Siletz River.

4.2 If Siletz or Drift Creek wild winter steelhead are documented to be secure, consider modifying angling regulations to allow consumptive harvest of wild steelhead.

SUMMER STEELHEAD

Background

The Siletz River contains the only summer steelhead run native to the Oregon coast range. Important habitat for summer steelhead is found above Siletz Falls (Figure 23). The presence of large rainbow trout, which are believed to have been steelhead, was identified several times in the upper Siletz River Basin from the 1930s through the 1950s, prior to the release of any hatchery summer steelhead.

It is thought that summer steelhead evolved in the Siletz River Basin because Siletz Falls (river mile 64.5) is only passable to anadromous fish during summer low flows. Similarly, native summer steelhead are found in short river systems in Washington and British Columbia where falls act as winter barriers to upstream migration.

The construction of a fish ladder around Siletz Falls in the 1950s eliminated the competitive advantage for summer steelhead by allowing easy passage for other species of anadromous fish into the upper Siletz River Basin. A summer steelhead hatchery program was initiated in 1958.

Wild Siletz summer steelhead returns have declined severely in recent years. A recovery plan has been initiated as a result. Actions include controlling fish passage at Siletz Falls so the area above the falls is reserved for summer steelhead recovery.

Status

During an intensive study of Siletz summer steelhead from 1969 through 1972, all summer steelhead going over Siletz Falls were trapped and counted (Weber and Fortune, no date). A creel survey of the sport fishery was also conducted. Average hatchery and wild run sizes during this time period were 5,039 and 842, respectively (Table 23). Wild summer steelhead comprised an average of 16% of the total returns. An average of 624 wild steelhead passed above Siletz Falls.

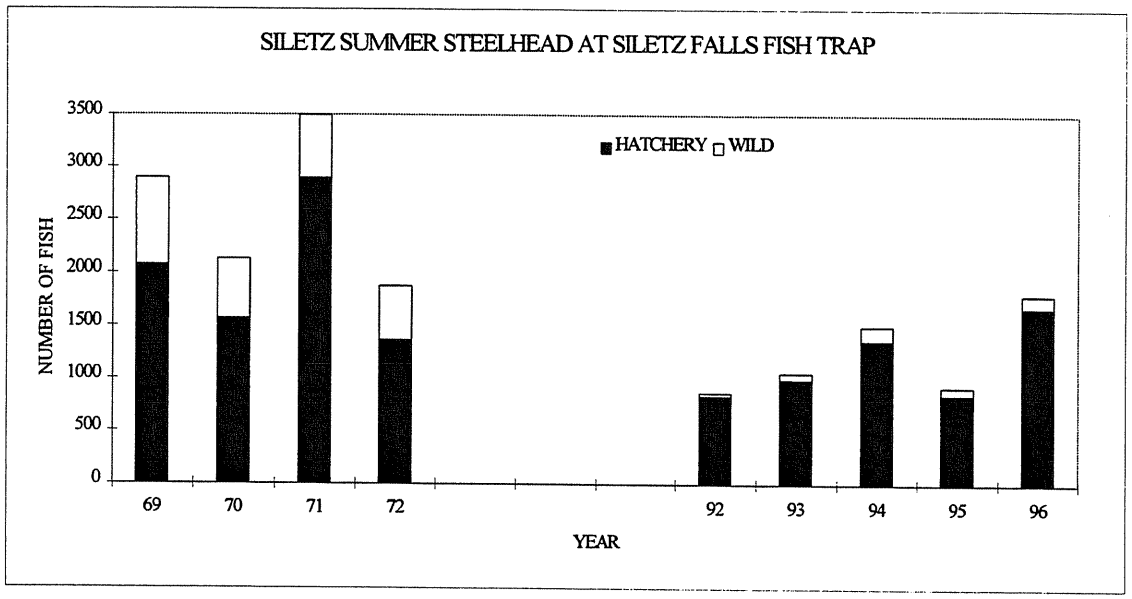
Trapping and creel data collected since this study indicate that the number and proportion of wild fish in the run have progressively declined. Intensive trapping at Siletz Falls during 1992-95 indicated the wild run passing above Siletz Falls averaged less than 100 fish per year (Figure 24). Wild fish comprised an average of 6% of the total summer steelhead return to the basin. These naturally-produced fish may be progeny of hatchery fish.

One factor thought to contribute to the decline in wild production of summer steelhead is competition with other species of anadromous fish that had access to the basin above Siletz Falls. The most likely source of competition is juvenile winter steelhead rearing in key steelhead production areas in the North Fork Siletz River Basin. In February 1994, the ODFW Commission approved program modifications to eliminate winter steelhead above the falls. This program was implemented during 1994-95.

Table 23. Estimated number of fish in the Siletz River summer steelhead run, 1969-72 (Weber and Fortune, no date).

	Hatchery Fish			Wild Fish			
Year	Trap catch	Angler catch below falls	Total run size	Trap catch	Angler catch below falls	Total run size	% wild fish
1969	2,075	1,612	3,687	824	285	1,109	23.1
1970	1,570	2,183	3,753	560	182	742	16.5
1971	2,895	5,510	8,405	601	95	696	7.6
1972	1,366	2,945	4,311	511	309	820	16.0
Avg.	1,977	3,062	5,039	624	218	842	15.8

Figure 24. Number of summer steelhead at Siletz Falls fish trap.



Other factors potentially contributing to the decline of Siletz summer steelhead are similar to those previously discussed for winter steelhead on the Oregon mid-coast.

Life History Characteristics and Habitat Needs

Adult summer steelhead generally return to freshwater on their spawning migration from May through November. Spawning occurs in the upper Siletz River Basin during January through May of the following year. The early return time and extended freshwater adult residency are the primary characteristics that distinguish them from winter steelhead. Adult summer steelhead will hold in freshwater in the cool water of the upper basin, most notably the North Fork.

Figure 23. Distribution of Summer Steelhead Salmon in the Siletz River Basin

SUMMER STEELHEAD DISTRIBUTION SILETZ RIVER BASIN

Spawning & Rearing

Rearing Only

Migration Routes & Fish Presence

Fish Hatchery

Barrier to Migration

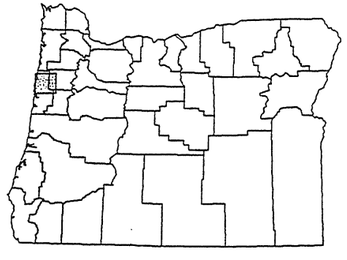
MI

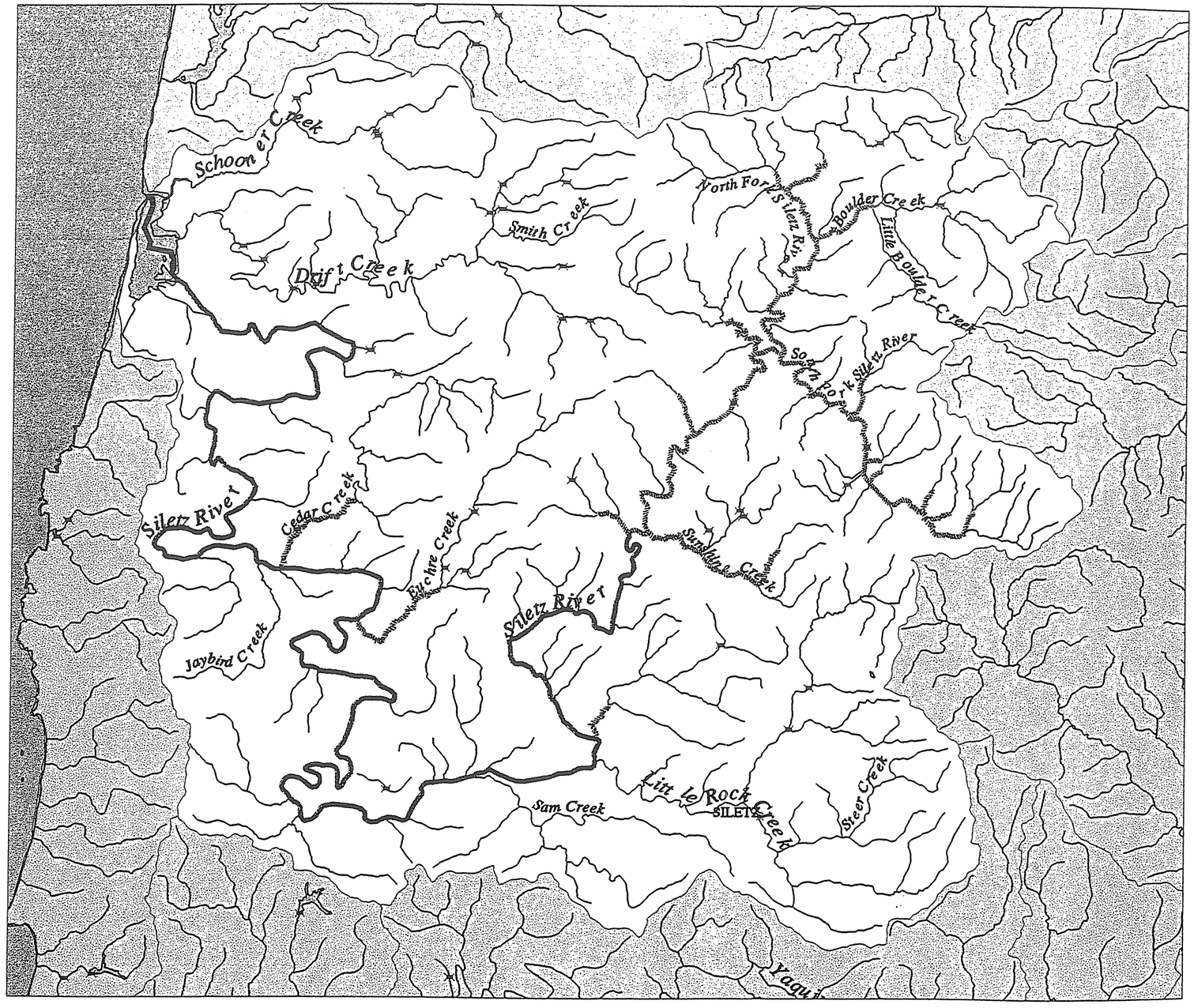
0 1 2 3 4

OREGON

Fish & Wildlife

Location





Juvenile summer steelhead appear to have life history characteristics and habitat requirements that are similar to winter steelhead.

Habitat Restoration Activities

Because of the uniqueness and precarious status of summer steelhead, habitat restoration efforts targeted at summer steelhead are a priority in the Siletz River Basin.

Streams having key summer steelhead habitat include the North Fork Siletz and its larger tributaries. These large, high gradient streams have good habitat consisting of stable, rocky instream structure. Trees that are of the large size that would be required to create additional habitat in these large, high gradient streams are available only in limited areas.

Habitat improvement could be considered in streams in the South Fork Siletz River Basin, including the old Valsetz Lake bed. However, at this time, the significance this area has for summer steelhead is not understood. This area is not a high priority for restoration at this time. Given these considerations, recommended activities for restoration of summer steelhead habitat are limited. They may increase as more is learned about summer steelhead habitat needs.

Proposed habitat restoration activities include:

1. Continue the habitat restoration efforts in Gravel Creek. This is an ongoing project to increase instream channel complexity. Streamside logs that were removed during stream clearance projects are being placed back into the stream. Gravel Creek is one of the few tributaries above Siletz Falls that is large enough to have substantial use by steelhead yet has moderate gradient. Because of its moderate gradient, it does not have the boulders found in most of the North Fork Siletz River. It also does not have the extremely high flows that make instream structure placement difficult. These factors along with the availability of large woody material make this project a high priority.

2. Use large woody material to create cover along the edges of pool habitats on the North Fork Siletz.

3. Identify and rehabilitate areas of the road system in the North Fork Siletz River Basin that could induce slides. This could include improvement on roads directly above a stream, pulling back sidecast where the slide potential is high, and putting non-essential roads to bed. It is not certain if road problems that could induce slides can be identified and corrected. However, due to the steep topography, the history of slides in the area, and the direct transport of large volumes of sediment to waterways, we consider this effort to be a high priority. Preventing slides in the North Fork Siletz River Basin will also benefit spring and fall chinook that spawn downstream in the mainstem Siletz River and improve juvenile rearing and adult salmonid habitat throughout the basin.

Hatchery Production

A summer steelhead hatchery program was initiated in 1958 in the Siletz River Basin using the Siletz native summer steelhead as broodstock. The objective of the hatchery program is to contribute to in-river steelhead fisheries. The annual target release number for the Siletz River Basin is 80,000 fin clipped smolts.

Brood fish for the hatchery program are collected by trapping adults at Siletz Falls from mid June through mid November. Adults are trapped through this time period to ensure that the entire run is represented in the hatchery program. After trapping, adults are transferred to Cedar Creek Hatchery on the Nestucca River where they are spawned. Juveniles are then brought back to Salmon River Hatchery for rearing. Smolt releases are spread from Twin Bridges (RM 43) upstream to the mouth of Buck Creek (RM59). Adults tend to be caught around the release site, but almost all adults are thought to ultimately migrate up to Siletz Falls.

In areas below Siletz Falls, interactions between wild winter steelhead and hatchery summer steelhead including interbreeding and competition are a concern. Spawning surveys conducted in the 1970s, however, indicated that few summer steelhead were found in areas below the falls inhabited by spawning winter steelhead.

Angling and Harvest

Siletz summer steelhead provide for an excellent bank fishery in the Siletz Gorge primarily during June and July and again during the fall. Private landowners sometimes restrict access to this area during mid and late summer due to fire concerns. Bank and boat angling also occurs below the gorge. Bank angling in this lower area is restricted by private property while boat access is limited by low summer flows.

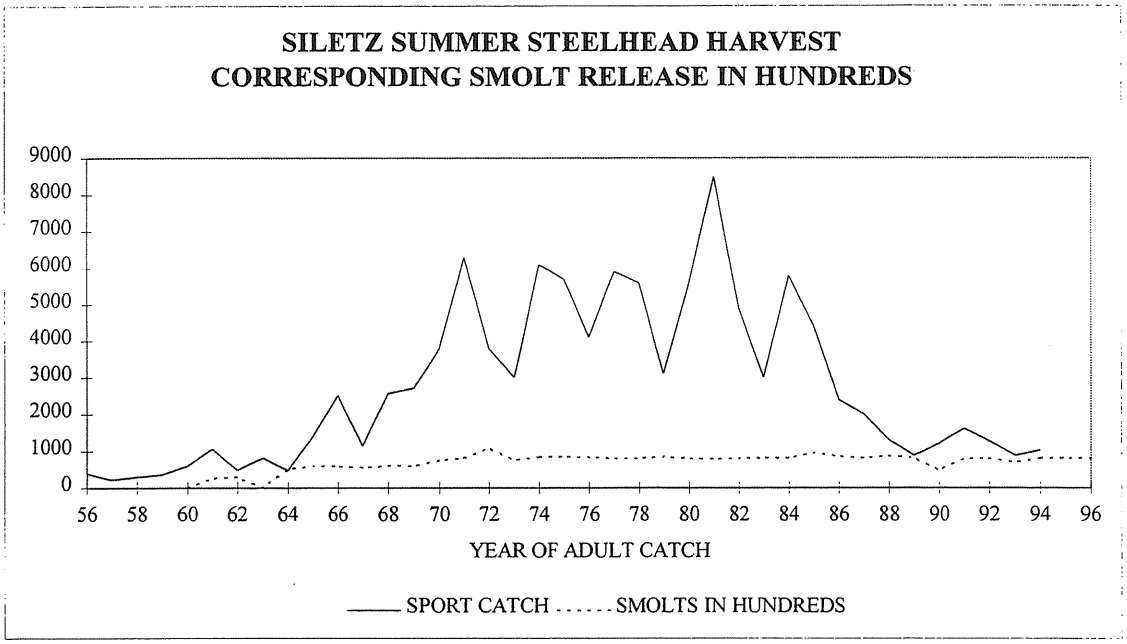
The fishery generated by the hatchery program has declined since the high success experienced prior to 1985 (Figure 25). The hatchery program has experienced reduced smolt survival in recent years. This decline has paralleled the decline in returns from hatchery winter steelhead programs on the mid-coast. Adult summer steelhead counts in resting hole snorkel surveys also show a decline in the return of hatchery and wild fish in recent years.

Angling regulations state that all non-fin clipped steelhead must be released unharmed.

Management Considerations

Summer steelhead in the Siletz River Basin will be managed for wild and hatchery production. Species that may compete with summer steelhead will be excluded from the area above Siletz Falls. These species include winter steelhead and coho salmon. Recovery of a sustainable wild run of summer steelhead will be attempted by passing a combination of hatchery and naturally produced fish above Siletz Falls. Up to 1,000 hatchery fish will be passed above the falls to supplement the few naturally produced fish until the wild run increases. The area above Siletz Falls will ultimately be managed for wild production only.

Figure 25. Summer steelhead harvest and corresponding smolt release, Siletz River Basin.



Summer steelhead hatchery smolt production will be maintained at 80,000 per year. Broodstock selection will be conducted in a manner that will maximize genetic diversity, although no naturally produced fish will be available for brood stock until the wild run recovers. Activities to improve understanding of the life history and habitat requirements of wild summer steelhead will be undertaken. Angling regulations that require the release of all non-fin clipped steelhead will continue.

The trap at Siletz Falls will be operated as necessary to control fish passage and estimate returns to the falls. Hatchery winter steelhead captured at the falls will be transferred to suitable reservoirs where they will supplement the existing trout fisheries. Naturally produced winter steelhead captured at the falls will be transferred to suitable habitat below the falls or will be used to provide brood stock for a new hatchery winter steelhead program in the Siletz River Basin. Naturally produced coho salmon will be transferred to suitable habitat below the falls to supplement other naturally produced coho salmon. Hatchery coho salmon will be removed from the spawning population. Chinook salmon passage above the falls will not be altered. The small chinook run (primarily springers) have a life history that creates little competition with summer steelhead. Naturally produced summer steelhead and up to 1,000 hatchery summer steelhead will be passed above the falls during initial years following removal of competing species from above the falls.

It is uncertain if preventing competitive species and hatchery produced summer steelhead above the falls will successfully re-establish sustaining wild summer steelhead runs. The hatchery program will be maintained below Siletz Falls to assure that the stock is available for other

options that may be considered if efforts are not successful. The return of a relatively large number of hatchery summer steelhead from the 80,000 smolt release should not undermine efforts to re-establish sustaining wild runs unless they can navigate the falls, and it will serve to maintain most of the fishery.

Policies

Policy 1. Summer steelhead in the Siletz River Basin shall be managed for wild and hatchery production.

Policy 2. Summer steelhead hatchery stocks that can be used in the Siletz River Basin are limited to the native Siletz summer steelhead stock.

Objectives

Objective 1. Achieve a wild summer steelhead spawning escapement of 700 adults.

Assumptions and Rationale

1. Wild summer steelhead production averaged 842 adults during 1969-72.

2. Ocean conditions will be less conducive to survival of summer steelhead smolts than survival rates during 1969-72.

3. More habitat will be available to summer steelhead due to the complete removal of winter steelhead and coho above Siletz Falls.

Actions

1.1 Operate the Siletz Falls fish trap as necessary to control fish passage above the falls and estimate returns to the falls.

1.2 Pass all naturally produced summer steelhead above the falls.

1.3 Initially (1995-99), pass up to 1,000 hatchery summer steelhead above Siletz Falls.

1.4 Prevent wild and hatchery winter steelhead and coho salmon from passing above the falls.

1.5 Eliminate or sharply reduce hatchery fish above Siletz Falls in the year 2000 and thereafter if wild summer steelhead numbers have increased.

1.6 If wild summer steelhead runs do not increase during the years 2000 to 2005, re-evaluate management programs.

1.7 Inventory juvenile salmonids in the area above Siletz Falls on an annual basis.

1.8 Continue the annual inventory of adult summer steelhead in resting holes above Siletz Falls.

1.9 Give specific emphasis to protecting and restoring habitat for steelhead in the area above Siletz Falls.

Objective 2. Provide an opportunity to catch an average of 2,400 hatchery summer steelhead in the Siletz River Basin.

Assumptions and Rationale

1. For hatchery summer steelhead smolts released in the Siletz River Basin, survival and fishery contribution will be intermediate between the 1970-85 period and the last 5 years.

2. During the 1970-85 time period, an average of about 5.3% of the hatchery smolts released were caught in Siletz River Basin fisheries. During 1988-92 an average of 1.5% were caught.

3. It is anticipated that in the near future an average of 3.0% of the smolts released will be caught in Siletz River Basin fisheries.

4. It is assumed that ocean conditions are a primary factor governing smolt survival and that ocean conditions will improve compared to the recent past.

Actions

2.1 Use punchcards to estimate angler catch

2.2 Continue to stock the Siletz River Basin with 80,000 summer steelhead smolts annually.

2.3 Recycle a portion of the surplus hatchery summer steelhead captured at the Siletz Falls fish trap to downstream areas on an experimental basis. Discontinue recycling if straying into areas supporting wild winter steelhead exceeds the standards in the Wild Fish Management Policy. Explore alternative options for use of surplus hatchery summer steelhead adults including use in reservoir fisheries or food share programs.

2.4 Consistent with sound fish culture practices, modify the rearing or release strategies for Siletz summer steelhead smolts to increase smolt to adult survival. This may include modification of time or location of smolt release or modifications in practices at the hatchery to improve smolt quality and survival.

2.5 Incorporate limited numbers of naturally produced adult summer steelhead into the hatchery broodstock if the total number of naturally produced adults passed above Siletz Falls exceeds 300.

CUTTHROAT TROUT

Background

Cutthroat trout are distributed widely throughout all Oregon coastal basins including the Siletz. The Siletz River Basin had a hatchery cutthroat trout program which used Alsea stock cutthroat raised at Alsea Hatchery. Cutthroat stocking was discontinued in 1997

Status

Multiple age classes of cutthroat trout are consistently present in a vast network of Oregon coastal streams. This wide distribution and consistent presence indicates that overall, cutthroat trout are very secure in Oregon coastal streams. It is not known, however, if these cutthroat trout observed in tributary streams are juvenile searuns, fluvial juveniles, or resident cutthroat.

Oregon Department of Forestry (DOF) studies were conducted during the summer of 1993 to determine the upstream distribution of gamefish. In coastal streams, cutthroat trout are consistently the gamefish species with the widest distribution. The evaluation indicated that based on sampling of townships near Toledo and Seaside, Oregon, there was an 80% chance that cutthroat trout would be present in a stream channel with a drainage area of greater than 100 acres. The study also determined that there are about 1.6 miles of stream containing cutthroat trout per square mile of drainage area. Using this information, the Siletz River Basin, which has a drainage area of about 364 square miles, contains about 600 miles of stream containing cutthroat trout.

There have been no studies specifically on searun cutthroat trout in the Siletz River Basin. In nearby basins where searun cutthroat have been monitored including the Alsea, Siuslaw, and North Umpqua, there was a substantial decline in both hatchery and wild searun cutthroat over the last 20 years. It is thought the pattern in the Siletz River Basin is similar. The angling public usually identifies a decline in searun cutthroat trout abundance.

Factors that are causing the decline in searun cutthroat trout returns are unknown. Potential factors are generally thought to be the same as for steelhead and include ocean conditions, marine mammals, habitat deterioration, hatchery influences, and angler harvest.

Life History and Population Characteristics

Cutthroat trout exhibit several life history patterns (Trotter 1989). Resident cutthroat spend their entire life history in tributary streams and mature at a small size, usually less than 10 inches. They do not migrate within or out of the basin. There are 9 identified resident cutthroat trout populations above barriers in the Siletz River Basin (Table 24). In addition, other resident cutthroat trout populations exist above barriers that have not been identified and resident trout are present in streams accessible to anadromous fish.

Table 24. Cutthroat trout populations above barriers to anadromous fish in the Siletz Basin.

Location	Comments
Euchre Creek	Verified above bedrock falls
Dewey Creek	Verified above bedrock falls
Big Rock Creek	Verified above bedrock falls
Little Rock Creek	Verified above bedrock falls
Drift Creek Tributary	Verified above bedrock falls
Sampson Creek	Verified above bedrock falls
Schooner Creek	Fish ladders put around barriers in 1980,s

Fluvial cutthroat trout spawn and rear as juveniles in small streams. They migrate to larger stream reaches and rivers where they attain greater size prior to maturation. Fluvial cutthroat will frequently attain a size of 12 to 16 inches before spawning.

Searun or anadromous cutthroat trout spawn and rear for 2 to 4 years in headwater streams before smolting and migrating to the ocean. They remain in the ocean for one summer and then return to freshwater from July through October to spawn the following winter or spring at a size of 12 to 20 inches (Giger, 1972).

Studies conducted on Oregon south coast streams suggest that there are genetically different populations of cutthroat trout within river basins and that tributary populations are commonly isolated from mixing with mainstem populations.

Habitat Restoration Activities

Habitat restoration activities directed specifically at cutthroat trout have not been given a high priority in the Siletz River Basin at this time because the network of small streams where they are dominant is so vast that achieving meaningful habitat improvement would be difficult. Cutthroat should benefit from restoration efforts directed at coho salmon.

Hatchery Production

The Siletz River Basin has been stocked with hatchery cutthroat trout from Alsea Hatchery since at least 1962 through 1996 (Table 25). The recently terminated program targeted 20,000 yearling hatchery cutthroat trout at a size of 3 fish per pound. The program is designed to provide for a spring fishery as put-and-take catchables and contribute to searun cutthroat fisheries the following summer and fall.

Table 25. Cutthroat stocking history, Lincoln District.

	Siletz River	Drift Creek
Years	Cutthroat Yearling	Cutthroat Fry
1962	9,991	0
1963	14,499	0
1964	8,502	0
1965	8,002	0
1966	10,996	0
1967	10,005	0
1968	10,000	0
1969	11,000	0
1970	10,000	0
1971	11,900	0
1972	15,040	0
1973	11,580	0
1974	15,000	0
1975	15,230	0
1976	20,120	0
1977	18,617	0
1978	20,116	0
1979	14,760	0
1980	20,048	0
1981	19,645	0
1982	19,914	0
1983	6,619	0
1984	18,445	36,500
1985	13,908	0
1986	20,129	0
1987	20,009	0
1988	20,025	0
1989	19,820	0
1990	20,029	0
1991	24,968	0
1992	21,025	0
1993	20,009	0
1994	20,041	0
1995	10,000	0
1996	3,069	0
1997	0	0

The hatchery broodstock used for the Siletz River cutthroat trout releases was obtained from native Alsea River cutthroat trout in about 1936. The brood was maintained at Alsea

Hatchery by hatching and raising fish to maturity at the hatchery rather than by capturing returning anadromous adults. The broodstock had little infusion of wild cutthroat trout since it was established.

There are no recapture facilities for returning hatchery adult searun cutthroat trout in the Siletz River Basin.

The contribution of hatchery cutthroat trout to the Siletz River Basin fisheries is not well documented. In the Alsea River Basin, where hatchery programs for cutthroat trout were similar to those in the Siletz River Basin, the contribution to the fisheries as a percentage of the hatchery fish released has been about 11% in the spring fishery and 1% in the searun cutthroat trout fishery. The contribution rate of hatchery fish in the Siletz River Basin is thought to be comparable or lower. Estimates made by Gene Stewart, the District Biologist (1976-1993), suggested that about 5% of the cutthroat trout releases in the Siletz River Basin are caught in the fisheries. ODFW's target catch rate for trout stocked at the size of 3 fish per pound is 40% of the number released. The stocking of any coastal stream with cutthroat was discontinued in 1997.

Angling and Harvest

Beginning in 1997, all fisheries for cutthroat trout were placed under catch and release regulations due to concern for wild searun cutthroat trout. Prior to 1997, consumptive angling for cutthroat trout was allowed throughout most of the Siletz River Basin.

Management Considerations

Cutthroat trout in the Siletz River Basin will be managed for wild production only. This is consistent with the ODFW coastwide management direction to discontinue searun cutthroat hatchery programs in streams.

The hatchery space that had been used to raise searun smolts will be used to produce catchable size trout for stocking in lakes or reservoirs. Stocking of these standing waters will increase, will be spread into the fall and will include regular stocking of larger size fish. It is expected that this will greatly increase angler return from the hatchery program.

Subsequent to the initial writing of this plan, the ODFW Commission decided to close all coastal streams to consumptive harvest of cutthroat trout due to the depressed status of the searun cutthroat trout population. Retention of all cutthroat trout will remain closed until population data warrants resumed harvest. However, angling opportunity for cutthroat trout remains an objective of this plan with consumptive harvest potential considered in the future if population status warrants.

Policies

Policy 1. Cutthroat trout in stream reaches of the Siletz River Basin shall be managed for wild production only. Hatchery programs for trout shall be confined to lakes and reservoirs without substantial wild cutthroat trout production.

Objectives

Objective 1. Maintain the existing distribution and density of wild cutthroat trout in the Siletz River Basin.

Assumptions and Rationale

1. Cutthroat trout are found in about 600 miles of stream habitat in the Siletz River Basin.

2. The differences between resident, fluvial, and anadromous cutthroat trout and the factors determining the relative abundance of the different life history types are not understood.

3. The future abundance of cutthroat trout with different life history types can not be predicted.

4. Baseline information on cutthroat trout densities is available from fish sampling associated with research on coho salmon.

Actions

1.1 Measure cutthroat trout densities in tributary streams during sampling for multiple salmonid species and compare to historic abundance.

1.2 Systematically document cutthroat trout distribution as necessary to implement the Oregon Forest Practices Act. Use this information to determine changes in overall cutthroat trout distribution.

1.3 Accomplish habitat protection and restoration objectives.

1.4 Continue annual angler surveys for cutthroat trout on the opening day of the spring trout season.

Objective 2. Re-establish spring, summer and early fall consumptive fishing opportunities for cutthroat trout in Siletz River Basin streams, when populations warrant.

Assumptions and Rationale

1. The fishing opportunity will continue as a catch and release fishery unless population status warrants a resumption of consumptive harvest.

2. A broad opportunity for an introductory fishing opportunity makes these fisheries desirable.

Actions

2.1. Continue existing catch and release angling opportunity throughout the Siletz River Basin.

2.2. Re-instate angling regulations allowing a consumptive fishing opportunity for cutthroat trout in most areas of the Siletz River Basin if population status warrants.

WHITE AND GREEN STURGEON

Background

White and green sturgeon are found in the Siletz River estuary. White sturgeon in the Siletz River Basin are probably fish that were spawned in the Columbia River, migrated to the ocean, moved southward along the coast, and entered the Siletz estuary. The origin of green sturgeon in the basin is unknown. However natural production of sturgeon in the Siletz River Basin is not thought to occur.

Life History Characteristics and Habitat Needs

The white sturgeon is the largest freshwater fish in North America, capable of reaching a weight of 1,800 pounds (Scott and Crossman 1973). White sturgeon are slow growing and very long lived. The largest individuals may be over 100 years old. A 36 inch sturgeon from the Columbia River will be about 9 years old (Hess 1984). Females mature at 15 to 20 years of age, while males may be younger at first spawning (Bajkov 1951).

Mature adults spawn in the spring or early summer in the freshwater portion of large rivers in continuous swift current (Scott and Crossman 1973). The Siletz River Basin does not have suitable conditions for white sturgeon spawning.

Little is known about the life history of the green sturgeon. It spends more time in the ocean than the white sturgeon. Like all sturgeon, it enters rivers to spawn. The green sturgeon reaches a maximum size of about 350 pounds (Scott and Crossman 1973).

Sturgeon may spawn many times during their lives but do not spawn every year. The time between spawning gets greater with age. Fecundity also increases with age.

Angling and Harvest

The recreational fishery for sturgeon is of low intensity and appears to be sufficiently supported by sturgeon migrating into the Siletz River from other river systems.

Regulations currently allow the taking of one sturgeon between 42 and 60 inches in length the entire year in tidewater during daylight hours. Above tidewater, sturgeon can only be taken when the stream is open to salmon and steelhead angling. A valid sturgeon tag or daily angling license must be in possession when angling for sturgeon.

Management Considerations

White and green sturgeon in the Siletz River Basin will be managed for wild production. Successful reproduction of sturgeon probably does not occur in the Siletz River Basin. Independent populations of white and green sturgeon are not present.

Policies

Policy 1. Siletz River Basin management of white and green sturgeon shall be consistent with management in the lower Columbia and other coastal estuaries.

Policy 2. There shall be no hatchery programs or transplants of sturgeon in the Siletz River Basin.

Objectives

Objective 1. Provide angling opportunities for sturgeon in the Siletz River.

Assumptions and Rationale

1. Green and white sturgeon in the Siletz River Basin depend on production and immigration of sturgeon from other river systems.

2. White sturgeon is the target species.

Actions

1.1 Monitor harvest of legal-size sturgeon through angler punchcard information.

PACIFIC LAMPREY

Background

Pacific lamprey (*Lampetra tridentata*) are found along the Pacific coast of North America from Unalaska Island, Alaska, south to southern California. Pacific lamprey migrate into all major river systems, often moving substantial distances upstream to headwaters.

Status

Pacific lamprey have been designated as a sensitive species by the State of Oregon. Pronounced declines in Pacific lamprey numbers have been noted statewide. Factors responsible for the decline of Pacific lamprey are not understood. Potential factors include degradation of spawning and larval rearing habitat, ocean conditions, marine mammal predation, and passage problems.

Life History Characteristics

Like salmon and steelhead, Pacific lamprey are anadromous, although numerous landlocked populations are known. Adults, 12 inches and greater in length, migrate into freshwater from July to September and spawn the following spring (Scott and Crossman 1973). Mature adult Pacific lamprey have also been identified to enter freshwater during the spring immediately prior to spawning (Wydoski 1979). Their moderately strong swimming ability and their capacity to cling to rocks, dams, and fish ladders by means of a disc-shaped mouth enables them to overcome many passage barriers.

Nest building and spawning occur from April to July in sandy gravel at the upstream edge of riffles. Females lay from 30,000 to 100,000 eggs. Adults die soon after spawning.

Eggs hatch in two to three weeks. The larvae, or ammocoetes, burrow into the fine substrates along the margin of streams downstream from their nest. The filter feeding ammocoetes spend 5 to 6 years in freshwater.

Toward the end of their freshwater period, the amocoete transforms into the adult form. They migrate downstream in the late summer or fall with increasing flows. In the ocean they adopt a parasitic life, and prey upon soft scaled fish and other marine vertebrates. Lampreys live one to two years at sea before returning to freshwater to spawn. Diet studies indicate marine mammals are natural predators of lampreys (Roffe and Mate 1984).

Harvest

Lamprey harvest in freshwater is allowed year round with no bag limit.

Indians throughout the northwest, including the Siletz Tribe, have used the lamprey as an important food source (Downey et al. 1993). The Siletz Tribe is very concerned about the reduced opportunity to harvest lamprey due to declines in abundance.

Management Considerations

Pacific lamprey in the Siletz River Basin will be managed for wild production only. Management activities for lamprey will focus on habitat protection. It is assumed that efforts to recover habitat for salmonids will also benefit lamprey.

Policies

Policy 1. The Siletz River Basin shall be managed for wild production of Pacific lamprey.

Objectives

Objective 1. Maintain or increase Pacific lamprey production in the Siletz River Basin where they naturally occur.

Assumptions and Rationale

1. The habitat required by Pacific lamprey will be provided by accomplishing basin wide habitat objectives.

2. Pacific lampreys historically provided for an important fishery for the Siletz Indian tribe. Recent declines in Pacific lamprey abundance have nearly eliminated this fishery.

Actions

1.1 While conducting routine inventory for other fish species, collect and summarize information for lampreys.

1.2 Accomplish basin habitat protection and restoration objectives.

1.3 Support and seek funding for research on Pacific lamprey life history, habitat requirements and factors responsible for declining abundance.

CRAYFISH

Background

Crayfish are the most important freshwater invertebrate to Oregon's fisheries. They provide a small fishery and are also important fish forage in the Siletz River Basin.

Status

Three species of crayfish are native to Oregon (Hobbs 1976). These species, their subspecies and intergrades are spread statewide, with overlapping distributions.

There are no quantitative estimates of population size or status of crayfish in the Siletz River Basin. Crayfish are frequently observed in moderate numbers during surveys for other species.

Life History Characteristics

Crayfish breed in the summer, with the first egg-bearing females appearing as early as September. Eggs are carried over the winter and hatch from late April to late June. The young are attached to the female by a thread-like material for a short time. Size achieved by zero-age crayfish during the first summer is quite variable due to the long period over which eggs hatch. Age determination by the length-frequency method is extremely difficult.

Females mature at about 18-30 months. Fecundity increases with size and perhaps age. There is evidence to suggest that some or perhaps all females do not breed each year.

Hatchery Production

There is no hatchery production of crayfish in the Siletz River Basin. No commercial crayfish culture operations have yet been successful in the state.

Harvest

Crayfish have been fished commercially in Oregon since before 1893 when records were first kept. Markets for bait and for restaurant food dictate the size of landings. Most of the Siletz River Basin harvest occurs during June through September (ODFW, unpublished data). There are no estimates of commercial landings specifically for the Siletz River Basin. Lincoln and Polk county landings, which may or may not be from the Siletz River Basin, have been zero during the past four years.

The commercial crayfish season is open from April 1 through October 31. Crayfish may be taken only by crayfish pots or ring nets. Only crayfish 3-5/8 inches or longer in length may be taken. Undersized crayfish must be returned unharmed to the water. Any crayfish caught with

eggs attached must be returned unharmed to the water. Gear must be labeled with an identification number issued by ODFW.

Recreational use of the resource is widespread for bait and direct consumption. No license is required to take crayfish. The daily bag limit is 100 per person. The season is open the entire year at all hours. Estimates of sport harvest levels in the Siletz River Basin are unknown.

Management Considerations

Habitat deterioration is the most serious threat to crayfish populations. Local populations may be subject to overharvesting.

Crayfish in the Siletz River Basin will be managed for wild production only to provide for commercial and recreational fisheries.

Objectives

Objective 1. Maintain natural production of crayfish in the Siletz River Basin.

Assumptions and Rationale

1. Quantitative information is not available for crayfish distribution, abundance, and population characteristics in the Siletz River Basin.

2. Information on crayfish could be collected during routine surveys for other species.

3. Protection and enhancement of crayfish populations can be achieved principally through habitat protection.

4. Recreational and commercial harvest of crayfish in the Siletz River Basin is not excessive at this time.

Actions

1.1 While conducting routine inventory for juvenile salmonids or creel surveys, record and file observations of crayfish in a standardized format.

1.2 Monitor commercial crayfish landings in Polk and Lincoln County. If substantial landings occur, investigate if they are from the Siletz River Basin.

1.3 Accomplish basin habitat protection and restoration objectives.

Objective 2. Determine the size and importance of the recreational crayfish harvest in the Siletz River Basin

Assumptions and Rationale

1. There are no estimates of current harvest or effort.

2. Recreational harvest is widespread and may be increasing.

3. Recreational harvest could be described and monitored through time by counting and checking fishermen during peak use periods in mid summer following a consistent procedure.

Actions

2.1 Conduct annual creel surveys in key areas during peak time periods to evaluate harvest and effort.

Objective 3. Maintain recreational crayfish harvest opportunity in the Siletz River Basin.

Assumptions and Rationale

1. Recreational harvest of crayfish in the Siletz River Basin is not excessive at this time.

Actions

3.1 Maintain existing crayfish angling regulations.

ANGLER ACCESS

Background

The Siletz River Basin has a wide variety of angling opportunities distributed throughout the basin. Since there is limited public land in the basin, most angler access is either by boat or through private land (Figure 26).

Tidewater portions of the Siletz River are accessible to boat anglers who launch at one of the several private moorages dispersed throughout tidewater (Table 26). The Siletz River is suited to drift boat, canoe, or raft use from the head of tidewater near Strome Park (river mile 17) upstream to Moonshine Park (river mile 53). Numerous boat launches are spread throughout this section of river. Most are maintained by Lincoln County and are in good condition. The launches at Ojalla Bridge and Mill Creek near Logsden are in need of maintenance. The Siletz River upstream from Moonshine Park is dangerous for boating in most areas. There are no maintained boat launches above Moonshine Park.

Table 26. Maintained boat launches in the Siletz River Basin.

Facility	Location (river mile)	Ownership
Siletz Moorage	0.5	Private
Coyote Rock	2.5	Private
Chinook Bend	3.5	Private
Sportsman's Landing	4.0	Private
Sunset Landing	5.0	Private
Strome Park	16.5	County
Morgan Park	25.0	County
Ojalla Bridge	31.0	Private/State
Mill Park	36.0	City/Private
Hee Hee Illyhee Park	41.0	County
Twin Bridges	45.5	County
Mill Creek	49.0	County
Moonshine Park	52.5	County

Bank access is available throughout the Siletz River Basin. Land surrounding the mainstem Siletz River and its tributaries downstream from Moonshine Park are in mixed private ownership. Bank access in this area generally requires permission from individual landowners. In the area known as the Siletz Gorge, upstream from Moonshine Park, the majority of the land is owned by two large private timber companies, Georgia Pacific and Boise Cascade. At the present time Boise Cascade is allowing access to their land except during periods of high fire danger. Georgia Pacific is allowing access on weekends and holidays when fire danger is not

Figure 26. River Access in the Siletz River Basin

RIVER ACCESS
SILETZ RIVER BASIN

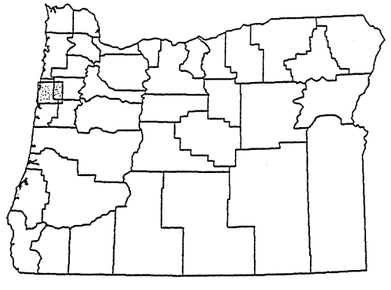
- Public Boat Access
- Pay Boat Access
- Seasonal Salmon & Steelhead Fishing Opportunities
- Primary Bank Access
- Public Bank Access
- Public Lands
- Close to Angling Year Round

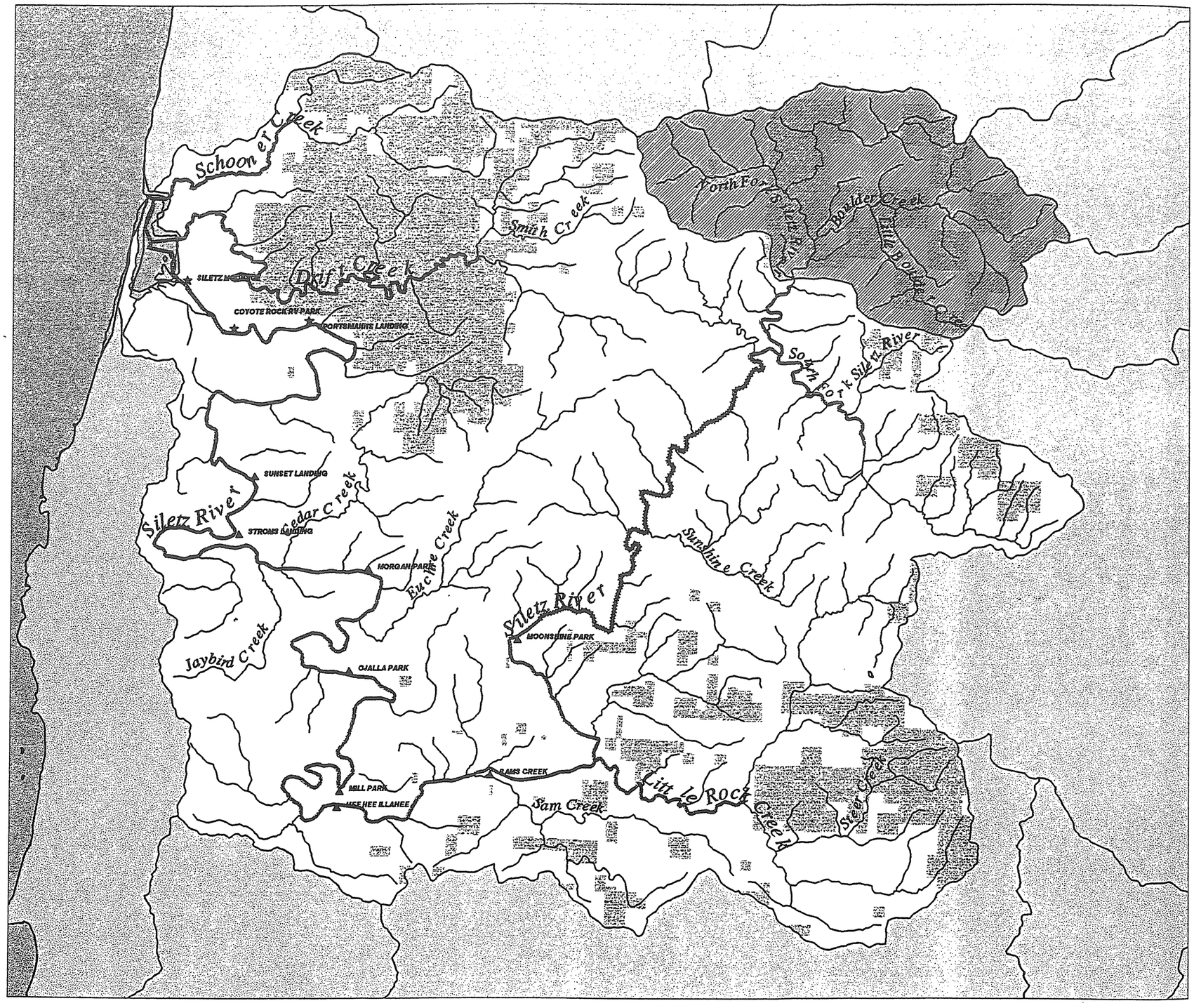
MI

0 1 2 3 4

OREGON
Fish & Wildlife

Location





excessive. Because of the extensive high quality bank fishing opportunities on private timber land in the Siletz Gorge, it is a priority to maintain angler access in this area. Drift Creek, which is largely in federal ownership, provides opportunities for hike-in fishing for trout, steelhead and in some cases chinook salmon.

Management Considerations

Overall, angler access in the Siletz River Basin is good. Much of the access is secure due to numerous boat launches and easily navigable waters, or in some cases federal land. The greatest risk for reduced angler access could occur if large timber companies close access to the Siletz Gorge. Conflicts between anglers and landowners primarily involve trespass, littering, and damage to vegetation. Incentives are needed to encourage landowners to maintain public access to this area. Anglers must police their ranks to assure all anglers respect private property.

Policies

Policy 1. The Department shall seek to provide access for boat and bank angling that will satisfy public need for a variety of angling opportunities and a dispersion of angling effort throughout the basin.

Policy 2. Acquisition and development of angler access sites shall be consistent with guidelines and objectives for management of fish species and habitat.

Objectives

Objective 1. Maintain sufficient boat launches to allow anglers access to areas from Moonshine Park downstream to the mouth of Siletz Bay.

Assumptions and Rationale

1. Private moorage operators will continue to maintain boat launches throughout tidewater areas.

2. Lincoln County will continue to maintain most boat launches between Moonshine Park and the head of tidewater.

3. Additional effort by angler groups, ODFW or others may be required to maintain some of the small boat launches between Moonshine Park and the head of tidewater.

Actions

1.1 Stay appraised on the condition of boat launches between Moonshine Park and the head of tidewater and seek to organize repair through cooperative ventures, if needed.

Objective 2. Maintain bank angling access in the Siletz Gorge.

Assumptions and Rationale

1. The Siletz Gorge has premier bank fishing opportunities including most of the summer steelhead fishery and a significant portion of the winter steelhead fishery.

2. Angler access to the Siletz Gorge will be closed during high fire danger periods or during weekdays when intense commercial forestry activities are occurring.

Actions

2.1 Encourage the pubic to be good stewards of the land when given the privilege of accessing private land.

2.2 Continue open dialogue with large timber companies to maintain bank angler access to the Siletz Gorge.

PRIORITIES

The following are considered the highest priorities in the Siletz River Basin:

Table 27. Priority fishery management actions in the Siletz River Basin.

Section	Action
Overview	
	Action 1.1. Overall Habitat
	Action 1.4. Recovery programs for severely depressed populations
	A. Summer steelhead
	B. Coho Salmon
Winter Steelhead	
	Action 2.1. Spawning surveys
	Action 2.2. Juvenile surveys
	Action 3.1. Develop new winter steelhead hatchery program with wild broodstock

The management actions and their funding status for habitat, each of the species or species groups, angler access, and general management needs are listed in the following table.

Table 28. Funding status for actions identified in this plan.

Action	Requires action by other jurisdictions	Currently funded	Requires additional funding	
			Short term	Long term
Overview				
Obj. 1, Fish assemblage				
1.1 : Overall Habitat	X	X	X	X
1.2 : Hatchery strays		X	X	
1.3 : Harvest of fish		X		
1.4 : Recovery programs	X		X	X
1.5 : Predation study	X		X	
Habitat				
Obj. 1, Summer stream flow				
1.1 : Flow measurement	X			
1.2 : Instream water rights	X			
1.3 : Abandoned WR's	X		X	
1.4 : Enforcement of WR's	X	X		
1.5 : Cumulative WR's	X	X		
1.6 : Review of new WR's	X	X		
1.7 : Recommend reservoirs	X	X		
Obj. 2, Summer temperatures				
2.1 : Temp. monitors	X		X	
2.2 : Temp. monitors	X			X
2.3 : Forest shade	X	X		X

Action	Requires action by other jurisdictions	Currently funded	Requires additional funding Short term	Long term
2.4 : Agriculture shade	X	X		X
2.5 : Residential shade	X	X		X
2.6 : Channel widening	X	X		X
2.7 : Data availability	X	X		
Obj. 3, Instream structure				
3.1 : Measure	X	X	X	X
3.2 : Comment on buffers	X	X		X
3.3 : ID restoration sites	X	X		
3.4 : Implement restoration	X	X	X	X
3.5 : Beaver benefits	X	X		X
3.6 : Riparian conifers	X	X		X
3.7 LWD in estuaries	X	X		X
Obj. 4, Sediment				
4.1 : Monitoring techniques	X		X	
4.2 : Monitor	X			X
4.3 : Cumulative effects	X	X		X
4.4 : Road sediments	X	X		X
4.5 : Mass failure reports	X	X		
4.6 : Turbid streams	X	X		
Obj. 5, Water quality				
5.1 : Recommend measuring	X	X		
5.2 : Consult with DEQ	X	X		
Obj. 6, Passage				
6.1 : Re-establish passage			X	X
6.2 : Inventory culverts	X		X	
6.3 : Correct passage	X		X	
Obj. 7, Aquatic area				
7.1 : Evaluate change	X	X	X	X
7.2 : ID priority areas	X	X		
7.3 : Prevent channelization	X	X		
7.4 : Prevent diking/filling	X	X		
7.5 : recover lost areas	X	X	X	X
Obj. 8, Communication				
8.1 : Communicate	X	X		

Action	Requires action by other jurisdictions	Currently funded	Requires additional funding Short term	Long term
Chum Obj. 1, action				
1.1 : Spawning surveys	X			X
1.2 : Exploratory surveys			X	
1.3 : Advise landowners	X	X		
1.4 : Habitat protection	X	X	X	X
1.5 : Angling regulations		X		
Fall Chinook Obj. 1, action				
1.1 : Monitor escapement		X		
1.2 : Drift Cr. survey				X
1.3 : Angling regulations		X		
1.4 : Conservative regulations		X		
Obj. 2, action				
2.1 : Angling regulations		X		
Obj. 3, action				
3.1 : Tribal fishery	X	X	X	X
3.2 : Fishing sites	X	X		
Spring Chinook Obj.1, action				
1.1 : Spawning surveys		X		X
1.2 : Angling regulations		X		
1.3 : Habitat protection	X	X	X	X
Obj. 2, action				
2.1 : Angling regulations		X		
Coho Obj. 1, action				
1.1 : Monitor escapement		X		X
1.2 Continue hatcthery release		X		
1.3 : Angling regulations		X		
1.4 Conservation hatchery			X	
1.5 : Survey potential habitat	X		X	
1.6: Land use activities	X	X		X
1.7 : Habitat restoration	X	X	X	X
1.8 : Beaver benefits	X	X		X
Obj. 2, action				
2.1 : Juvenile surveys	X			X
2.2 : Adult spawner goal		X		

Action	Requires action by other jurisdictions	Currently funded	Requires additional funding Short term	Long term
2.3 : Habitat limitations	X	X	X	X
2.4 : Population dynamics	X	X	X	X
Obj. 3, action				
3.1 : Angling regulations wild coho		X		
3.2 Angling regulations hatchery coho		X		
Obj. 4, action				
4.1 : Tribal fishery	X	X	X	X
Winter Steelhead Obj. 1, action				
1.1 : Overall habitat	X	X	X	X
1.2 : Land use activities	X	X		
1.3 : Passage above falls		X		X
1.4 : Angling regulations		X		
Obj. 2, action				
2.1 : Spawning surveys	X		X	
2.2 : Juvenile surveys	X		X	
2.3 : Trends in escapement	X	X		X
2.4 : Run size		X		
2.5 : Compile information		X		
2.6 Stray evaulation			X	
Obj. 3, action				
3.1 : Hatchery releases		X		
3.2 : Acclimation facility	X	X	X	
3.3 : Smolt transfer		X		
3.4 : Remove steelhead		X		
3.5 : WFMP		X		
3.6 : Release strategies			X	
3.7 : Mimic wild fish			X	
3.8 : Evaluate Drift Cr. for hatchery program	X	X		
Summer Steelhead Obj. 1, action				
1.1 : Fish passage		X	X	X
1.2 : Pass wild fish		X	X	X
1.3 : Pass hatchery fish		X	X	
1.4 : Trap winter migrating fish		X	X	X

Action	Requires action by other jurisdictions	Currently funded	Requires additional funding Short term	Long term
1.5 Hatchery fish passage		X	X	X
1.6 : Re-evaluate program		X		
1.7 : Juvenile surveys			X	X
1.8 : Resting hole counts		X		
1.9 : Habitat protection	X	X		X
Cutthroat Obj. 1, action				
1.1 : Measure abundance			X	
1.2 : Distribution	X	X	X	
1.3 : Habitat protection	X	X	X	X
1.4 Creel survey		X		
Obj. 2, action				
2.1 : Angling regulations		X		
Sturgeon Obj. 1, action				
1.1 : Monitor harvest		X		
Pacific Lamprey Obj. 1, action				
1.1 : Collect information		X		
1.2 : Habitat protection	X	X	X	X
1.3 : Research	X			
Crayfish Obj. 1, action				
1.1 : Record observations		X		
1.2 : Monitor commercial harvest		X		
1.3 : Habitat protection	X	X	X	X
Obj. 2, action				
2.1 Recreational creel		X		
Obj. 3, action				
3.1 Angling regulations		X		
Angler Access Obj. 1, action				
1.1 : Boat launches		X	X	
Obj. 2, action				
2.1 : Public stewardship	X	X		
2.2 : Improve access	X	X		

IMPLEMENTATION AND REVIEW

This plan is intended to provide both short-term and long-term direction for management of the fisheries in the basin. A separate "Action Plan" will be prepared by the Department that contains the actions from the basin plan that will be funded and undertaken during each biennium. Progress made implementing those actions will be reported by the Department every two years. At that time implementation priorities will also be re-examined and adjustments made where necessary.

Upon adoption by the Oregon Fish and Wildlife Commission, the policies and objectives will become Oregon Administrative Rules. As conditions for the resources and desires of the public change and as new information is obtained, the plan must be responsive and evolve as well. The entire plan, including policies and objectives, will be formally reviewed and revised every ten years. Interim changes in administrative rules can be made by the Commission in accordance with the Administrative Procedures Act when needed.

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APPENDICES

Appendix Table A-1
Angling and fish viewing opportunities in the Siletz River Basin.
Verify open seasons based on fishing regulation panphlets.

Fishing Opportunities

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Bay												
Crabbing	○	○	○	○	◎	◎	●	●	●	●	◎	○
Fall Chinook Salmon								◎	●	●		
Spring Chinook Salmon				○	○	○						
Cutthroat trout							●	●	◎			
Main River and Forks												
Winter Steelhead	●	●	◎	◎	○						○	●
Summer Steelhead	○				◎	●	●	●	●	●	○	○
Cutthroat trout					●	●	●	●	◎	◎		
Fall Chinook Salmon									●	●	◎	○
Spring Chinook Salmon					●	●						
Crayfish	○	○	◎	◎	◎	●	●	●	●	◎	○	○
Tributaries												
Cutthroat trout					●	●	●	●	◎	◎		
Crayfish	○	○	◎	◎	◎	●	●	●	●	◎	○	○

Appendix Table A-1 continued

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Spawning Chinook Salmon												
Site #1. Sunshine Creek											●	◐
Site #2. Buck Creek Bridge										◐	●	◐
Site #3. Mainstem Siletz River near Siletz											●	◐
Spawning Coho Salmon												
Site #1. Euchre Creek											●	◐
Site #2. Fourth of July Creek											●	◐
Juvenile Salmon and trout												
Site #1. Siletz River Basin tributaries						●	●	●	●			

Fishing and viewing opportunities

- ● Excellent
- ◐ Fair
- ○ Poor

APPENDIX B

Habitat Restoration Activities

Habitat protection measures, such as land use laws, the Forest Practices Act, and fill and removal laws, are necessary to maintain habitat conditions that currently support fish stocks and will continue to do so in the long term. Habitat restoration activities are intended to improve degraded habitats which have potential for increased production of depressed fish populations in the near term.

Areas in the Siletz River Basin were identified that have the greatest potential for benefitting fish stocks that are at risk. Restoration activities that have the greatest chance of producing measurable improvements in the status and abundance of fish stocks in the short term were identified for these areas. Priorities were developed based on current knowledge of the habitat needs of a species and the ability to artificially modify habitat to provide for these needs in an ecologically sound manner. Additional information on biology of fish runs, their habitat needs, and the condition of the existing habitat will in all probability lead to the identification of additional restoration opportunities. Restoration actions are targeted at improving conditions for a single species although it is recognized that other species will frequently benefit from the restoration efforts.

High priority areas are listed in Table B-1. More detailed descriptions of specific restoration activities for each species are provided in the species chapters in this document.

Table B-1. High priority areas and associated activities for habitat restoration in the Siletz River Basin.

Key species	Secondary species	Area	Activities
Coho salmon	Winter steelhead Cutthroat trout	Low gradient tributaries below Siletz Falls	Passage improvement; increase instream sedimentation control.
Summer steelhead	Cutthroat trout Chinook salmon	No. Fk. Siletz River Gravel Creek	Prevention of mass failures on slopes; increase instream structure.
Chum salmon	Coho salmon Winter steelhead Cutthroat trout	Bear Creek Cedar Creek	Sedimentation control; adult passage improvement.