United States
Department of
Agriculture

Forest Service

**Pacific
Northwest
Region**

2002

Mt. Hood National Forest Fisheries Program Accomplishment Report 2001

An Amazing Fish Year!

The variety and size of fish captured in waters on or near the Mt. Hood National Forest in 2001 was remarkable. A few are featured on the cover, beginning with the ***upper left corner:*** a 20-inch Bull trout, hooked on the Sandy River. Three bull trout have been found in the Sandy River system the past few years, previously they were considered extinct. Scientists are unsure of their origin or final destination (photo courtesy The Fly Shop, Welches, Oregon). ***Upper right:*** a 15-inch cutthroat from Timothy Lake. ***Middle right:*** a migratory, sea-run cutthroat trout caught in a smolt trap on Eagle Creek, Clackamas River. ***Lower right:*** a 42-inch late run coho salmon caught in the fish trap on North Fork dam, Clackamas River (photo courtesy Portland General Electric). ***Lower left:*** a stray sockeye salmon, found in the fish trap at North Fork dam (photo courtesy Portland General Electric).

All photos from USDA Forest Service, unless otherwise noted.

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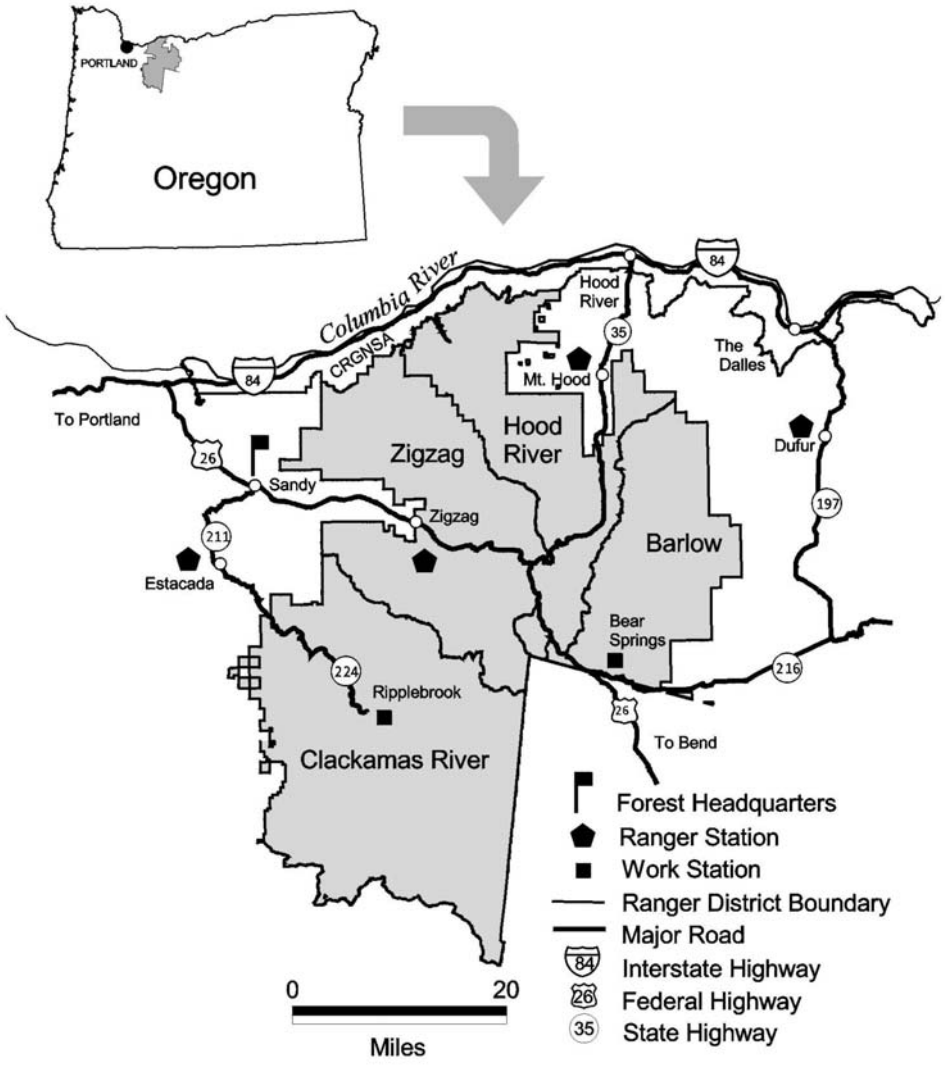
Mt. Hood National Forest Vicinity Map



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Introduction

This document highlights the excellent work and accomplishments of many components of the Fisheries Program in 2001 on the Mt. Hood National Forest. If you are interested in additional information about a program activity please contact any of the personnel listed at the end of the document.

The year 2001 was memorable for the Fisheries Program on the Mt. Hood National Forest (the Forest). For example, 2001 was one of the lowest rainfall amounts on record, and streams and rivers ran extremely low by the end of summer. We were amazingly surprised with large returns of salmon due to improved ocean conditions, and encountered a variety of unusual fish sightings as highlighted on the front cover. There was a major wildland fire in the Olallie Lakes area. The few remaining restoration projects from the floods of the mid-1990's were completed. Managing the Forest from a watershed perspective continued to gain prominence, and the Mt. Hood as an urban National Forest continued to emphasize environmental education, partnerships and public service. Finally, the terrorist attacks on September 11 gave pause to employees to reflect about their work, family and country. Some key highlights are listed below.

Fish Conservation

The recovery of fish listed under the Endangered Species Act is a cornerstone of the Fisheries Program. Protection and restoration of habitat on the Forest is the starting point of all projects. Fisheries staffs continue implementation of the Endangered Species Act, analyzing projects and writing 125 reporting documents to assure projects on the Forest either would aid in, or not impede, the recovery of fish. Forest Fish Biologist Dan Shively continued to serve on the National Marine Fisheries Service Salmon Recovery Team for the Lower Columbia and Upper Willamette.

Monan Lake was one of many lakes impacted by wildfire in the Olallie Lake Scenic Area. Postfire restoration included planting shrubs and grasses to reduce potential soil erosion.

The Ollalie Complex Fire

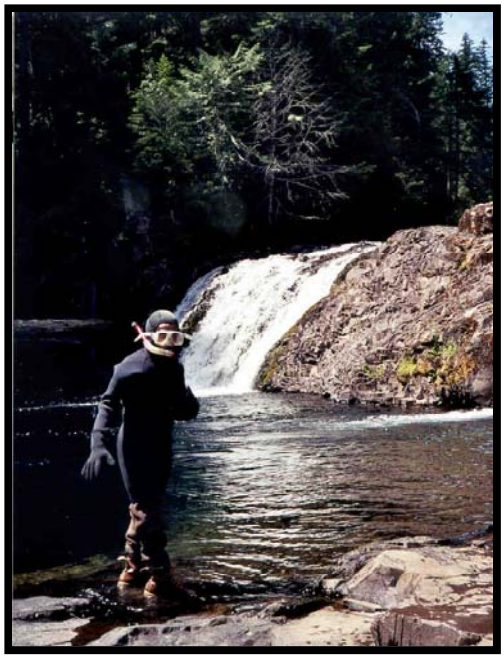
During August, lightening-sparked fires roared through the tinder-dry Ollalie Lake Scenic Area. The Ollalie Lake Scenic Area is famous for its numerous high altitude lakes. The fire impacted many lakes and burning vegetation on shorelines.

The Drought

The 2000-2001 water year (October 1, 2000 –September 30, 2001) was among the driest in Oregon history. In Portland, precipitation amounts set a new low record of 23 inches, compared to the previous low of 23.84 inches in 1976-77. During an average year precipitation is 36.3 inches. Stream flows on the Forest had comparable low flows. For example, on September 1st on the Clackamas River at Estacada, average stream flow is 880 cubic feet per second (cfs). On September 1, 2001 it was 600 cfs. See the United States Geological Survey website for more information at http://or.usgs.gov.

Hutton Junior Fisheries Biology Program

The Forest participated during the inaugural year of the American Fisheries Society Hutton Educational Program. The program provides a summer internship for minority and under-represented high school students with an interest in the fisheries profession. Fishery professional Katie Serres mentored Tigard High School student Jeff Woltering, and Tom Horning and Burke Strobel mentored Mikias Tizazu.



Hutton student Mikias Tizazu geared up for snorkel surveys.

Fish Conservation

On the Forest there are several species of Pacific salmon and resident trout with declining or extremely low populations. The fish in Table 1 are listed under the Endangered Species Act (ESA) as threatened, or are proposed or candidate species for ESA listing. Any federal action that may affect listed fish; such as harassing, collecting, or changing habitat (commonly known as "take"), must go through the consultation steps listed in the ESA.

Table 1. Status of Threatened Fish on the Mt. Hood National Forest in 2001.

Species	Evolutionarily Significant Unit Status
Chinook Salmon	**Listed Threatened** Lower Columbia River ESU 3/99 **Listed Threatened** Upper Willamette River ESU 3/99
Coho Salmon	**Candidate** Lower Columbia River/ Southwest WA ESU 7/95
Steelhead	**Listed Threatened** Lower Columbia River ESU 3/98 **Listed Threatened** Middle Columbia River ESU 3/99
Coastal Cutthroat Trout	**Proposed as Threatened** Southwest WA/Columbia River ESU 4/99
Bull Trout	**Listed Threatened** Columbia River Distinct Population Segment 5/98

The Forest consults with two federal regulatory agencies, U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS). Table 2 displays the number of consultation documents prepared by Forest Service fisheries biologists to meet requirements of the ESA. A biological evaluation is first completed, then, if warranted, a biological assessment is prepared. A team of biologists from federal agencies reviews proposed projects and the consultation documents. The team may specify guidelines to amend the proposed projects to minimize or eliminate impacts to fish. Preparation of documents and consultation with regulatory agencies continues to be a major work item.

Table 2. Summary of Consultation Documents Submitted to the National Marine Fisheries Service and the Fish and Wildlife Service.

Projects	Number of Biological Evaluations (BE's) and Assessments (BA's) Prepared	
	BE's	**BA's**
Timber Sales	5	17**
Recreation Projects	6	6
Restoration Projects	6	0
Engineering Projects	8	4
Summer Homes	4	0
Special Use Permits	6	3
Programmatic Actions	40 + 20*	0
Total	**95**	**30**

**See page 6, Forest-wide restoration planning.*

***In preparation for cutthroat trout listing.*

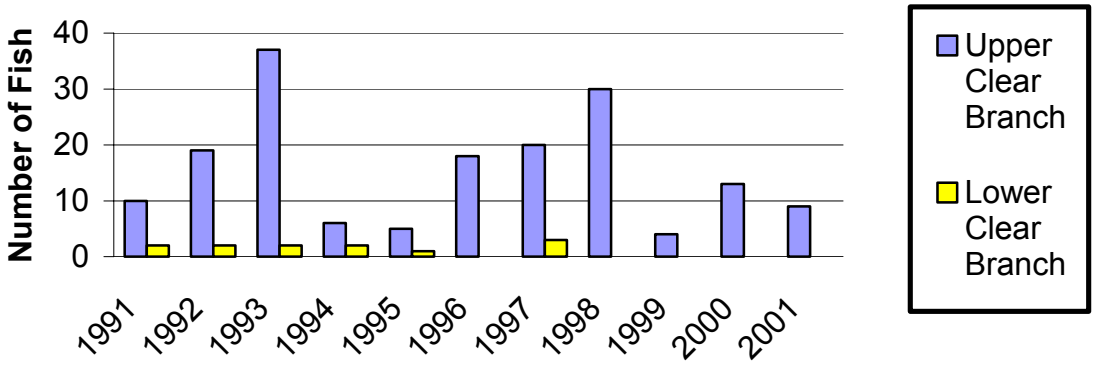
Hood River Bull Trout Working Group (Hood River Ranger District)

The Hood River inter-agency bull trout working group exemplifies the Forest's commitment to recovery of declining fish populations. Formed in 1989, cooperators include the Forest, Oregon Department of Fish and Wildlife, the Confederated Tribes of Warm Springs, Middle Fork Irrigation District and the U.S. Fish and Wildlife Service.

Snorkeling is the primary survey technique. Snorkeling at night is the most successful for ensuring consistent juvenile census. Night snorkeling is used for all exploratory surveys to find new populations within the Hood River Basin. Biologists are using snorkeling to develop a standard protocol for estimating juvenile densities. Day snorkeling is specifically conducted in Clear Branch Creek to get an annual count of upstream adult migrants into their spawning reaches. The results of the annual counts are displayed in Figure 1. It is the fourth consecutive year no adults have been found below the Clear Branch Dam.

A major restoration project was recently completed in upper Clear Branch Creek (see annual reports from 1999 and 2000). An abandoned channel was re-opened, creating high quality bull trout habitat. Surveys in the channel were completed in 2001, and it appears there was immediate colonization. In 2002, an index reach will be established, and it will be surveyed annually.

Figure 1. Adult Bull Trout Index Reach Monitoring (Clear Branch Creek, Hood River)



Redd surveys are repeated annually in low gradient, non-glacial streams to establish spawning index rates. For the first time, redds could be identified in Clear Branch Creek in 2001 (probably because of low water conditions). Eleven redds were found above the dam, and none below.

Since the inception of the monitoring program, bull trout distribution has expanded from Clear Branch and the Hood River mainstem to include Pinnacle Creek, Coe Branch/Compass Creek, Eliot Branch and Bear Creek. Population trends continue be stable but very low.

Willamette/Lower Columbia Technical Recovery Team (Headquarters)

Forest Fish Program Manager Dan Shively is a participant on the NMFS Technical Recovery Team for the four listed salmon and steelhead stocks in the Lower Columbia River and Willamette Basin. He is also chair of the habitat work group. The goal of the habitat work group is determine aquatic habitat needs for the four listed species. The task of the technical recovery team is to develop the ESA interim viaability criteria for the listed fish.

There has been a major effort by the habitat work group to develop a strategy on how to include habitat as part of the recovery plan. Dan led these efforts including:

- A review of all existing recovery plans for fish and other listed aquatic species nationwide (49 plans total covering 69 species) to investigate how habitat needs were addressed to assist in the development of de-listing criteria.
- Conducting a literature review on the ESA and species recovery planning.
- Completing a 16-page essay on habitat delisting criteria considerations for salmon recovery planning.
- Leading a field trip for Technical Team members to the Sandy and Clackamas basins.

Thinking Like a Watershed

The Fisheries Program continues to emphasize whole watershed management. Many activities are best done with a watershed or basin perspective. Examples include analysis across landscapes (such as watershed analysis), management of fish stocks, community involvement through watershed councils, and partnerships with other fish management organizations such as state government, private industry and research. On the following pages are projects with a watershed perspective.

Forest Watershed Restoration: Fifth-Field Analysis (Forest-wide)

An environmental assessment was completed examining restoration needs for fifth-field watersheds on the Forest in 2001. In the environmental assessment, 99 watershed restoration projects were analyzed for their impacts and effects. This has been an efficient and effective process. Similar types of projects from across the Forest were grouped and effects were analyzed from a watershed perspective. Table 3 shows a summary of the project types and number of each project type.

Table 3. Summary of Restoration Projects Evaluated in Forest-wide Watershed Restoration Environmental Analysis

Project Type	Number of Projects	Project Description
Fish Passage	25	Repair or replace culverts or bridges to improve fish passage.
Fencing	6	Protect sensitive riparian areas from cattle grazing.
Ditch Piping	2	Replace open ditches with pipes to screen fish from entry, reduce water temperatures, ditch failures, and prevent water loss through seepage.
Quarry Rehabilitation	4	Restore all or portions of rock quarries in riparian areas.
Instream Fish Habitat	12	Improve and restore fish habitat through placement of large wood, side channel restoration and boulder weirs.
Fish Carcasses	8	Place surplus fish hatchery carcasses in streams to increase nutrient levels.
Side Channel Improvements	4	Annual maintenance on side channels to improve access for fish.
Knotweed Removal	1	Remove knotweed from riparian areas.
Road Repairs	12	Deep patch repair on existing roads.
Bridge Replacement	3	Replace bridges damaged in landslides.
Road Decommissioning	1	Decommission 25 miles of road no longer needed.
Dispersed Recreation Site Improvements	20	Rehabilitate riparian areas damaged by vehicles.
Upland Erosion Control	1	Treat 159 acres with damaged soils by deep ripping skid trails; treat 144 acres with damaged soils by building water bars and berms on old skid trails.

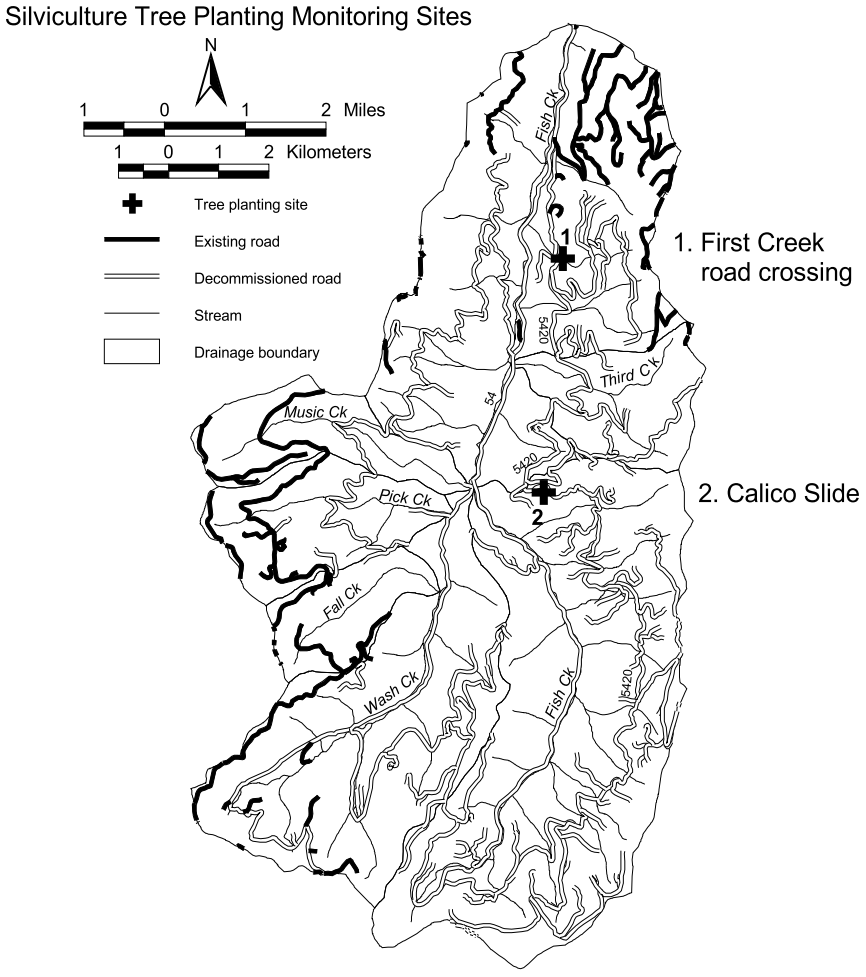
Fish Creek Watershed Monitoring (Clackamas River Ranger District)

During the winter of 1995-1996, several large winter storms struck the Fish Creek Watershed. In February 1996, there was a record-breaking storm, a combination of several days of intense rain coupled with a melting snow pack. The impacts of the storm on the watershed were widespread. Hundreds of landslides eliminated road segments and sluiced through streams.

Repair of storm damage in Fish Creek has been completed. Most of the road system has been obliterated. Hundreds of acres of young trees have been thinned or planted. Needed stream restoration work has been completed.

A watershed restoration monitoring plan was completed for Fish Creek in 2001. The document is found on the Forest website at http://www.fs.fed.us/r6/mthood/pubs.htm. It is notable because it integrates monitoring efforts from all resource areas into one document. Data from monitoring projects, including photos, is stored in the Geographic Information System (GIS). Map 1 is a sample of a Fish Creek GIS map. A major storm event triggers most future monitoring activities. During the winter of 2001-2002, there was major storm, and the full monitoring program will be implemented in 2002.

Map 1. Sample of Fish Creek Watershed Restoration Monitoring Map.



Salmon Carcass Enrichment (Forest Headquarters)

A major initiative to increase stream productivity with surplus salmon carcasses began in the Sandy and Clackamas River in 2001. The levels of stream nutrients (primarily nitrogen and phosphorus) in Pacific Northwest aquatic systems have been linked to the abundance of salmon carcasses. Stream nutrients are the foundation of stream productivity. It is believed stream systems with historically large salmon runs are now far below their capacity to produce juvenile and sea-migrating smolts.

"Surplus" salmon carcasses are hatchery bred salmon that have returned as adults to their hatchery of origin. Surplus fish are no longer needed by the hatchery, and are no longer suitable for human consumption.

In the fall of 2001 a trial run distributing salmon carcasses was completed. The logistics of moving, then distributing, thousands of fish to remote, forested streams is daunting. A total of 21 tons of surplus hatchery coho were added to tributaries in the Clackamas River and 16 tons in the Sandy River. It is not feasible to use hand labor on such a large operation. The fish were distributed to the stream by a helicopter. Dropping fish from a helicopter was tricky, and a retrofitted gravel bucket was found to be the best method.

Another objective of the trial run is to evaluate monitoring techniques. The carcass enrichment project is monitored through baseline water chemistry, periphyton and aquatic macroinvertebrates, and retention of carcasses in the watershed. In the future, carcasses will be distributed to five streams with smolt traps. Smolt trapping has been underway on the Forest since 1985. Three watersheds with smolt trapping sites will serve as controls. Five watersheds with smolt trapping sites will receive salmon carcass drops. It is hypothesized there will be a positive change in the condition factor of smolts in treatment watersheds.

The results following a bucket drop of salmon carcasses in the Clackamas River. Historically, thousands of salmon carcasses were found in Pacific Northwest rivers and on streambanks following spawning season.

Watershed Restoration Projects

Irrigation Ditch Screening (Barlow Ranger District)

Early European settlers and developers of crop land on the eastern side of the Forest constructed irrigation ditches to divert water from upland forest streams to arid low-lands. Some consequences of ditching water from streams include the entrapment of fish and loss of water through infiltration and evaporation. On the east side of the Forest, efforts are underway to screen irrigation ditches to protect fish and retain as much water flow as possible in streams.

The Highland Irrigation Ditch was constructed in the early 1900's. It diverts water from Badger Creek in the Badger Creek Wilderness, and transports it nearly four miles to agricultural fields off the Forest. Native rainbow/redband trout are present at the headgate (entrance) to the Highland Ditch. The Lost/Boulder Creek ditch is a similar project and comparable in size, but is located outside a wilderness area.

Oregon State law requires all water diversions from fish bearing streams to have screening facilities to preclude fish access into the diverted water (Oregon Revised Statute 509.615). In 2001, environmental analyis was completed so construction could commence to screen the inlet to prevent fish from entering the ditch, and to pipe the ditch to stop leakage and efficiently deliver water to the irrigation users. It is expected more water will remain in Badger Creek and Boulder Creek after the pipe is completed. After the irrigator receives their portion of their water rights, half of the water conserved through reduction in leakage and evaporation will be returned to the stream.

Local agencies review the Highland Ditch Headgate and discuss screening and piping plans.

In 2002, partners concerned with conserving water and assisting fish will contribute to the construction of the fish screens and pipes. It is proposed to screen and pipe 3.6 miles of Badger Creek and 2,200 feet of Lost/Boulder Creek. Project partners include Oregon Department of Fish and Wildlife, Badger Improvement District, Lost/Boulder Irrigators, Deschutes Resource Conservancy and Wasco County Soil and Water Conservation District. Other screening projects off the Forest (such as Central Canal and Evans Creek) are in planning stages and will be constructed as funding is secured and environmental documentation is completed.

Flows for Redds (Hood River Ranger District)

In the spring of 2001 biologists expanded steelhead spawning surveys to below Laurance Lake dam on the Clear Branch of Middle Fork Hood River. To their surprise, they found 19 redds (egg nests in gravel) in less than ½ mile of stream length. In June the Middle Fork Irrigation District has water rights to divert water and reduce river flows from 15 cfs to 3 cfs. Biologists were concerned the redds would be dewatered, thereby killing the steelhead eggs, if the allocated amount of water was taken from the river. Biologists met with Middle Fork Irrigation District staff, and on an extremely unusual day in June, biologists watched stream flows as the Middle Fork Irrigation District carefully reduced flows in Clear Branch. Diversion flows were stopped when flows decreased to the level of the redds. The Irrigation District was able to meet instream needs keeping flows at 9-10 cfs until mid-July, when juvenile steelhead were out of the gravel, and meet the needs of downstream water users.

Ramsey Creek (Barlow Ranger District)

The impacts of the 1996 flood in the Ramsey Creek watershed were severe. Several miles of stream downcut, the floodplain was abandoned, and the channel was simplified. Two years of intensive restoration projects were completed in 2001 in the 1,648 acre Ramsey Creek Planning Area (located between river mile 3.5 and 6.5). Table 4 outlines completed restoration projects.

Table 4. Completed Watershed Restoration Projects in Ramsey Creek Planning Area.

Project Type	Project Description
Large Wood Stream and Riparian Function	1,400 logs, dbh six to 36 inches and 20 to 50 feet in length were imported and placed in 79 areas in the stream channel and floodplain.
Stream Habitat Restoration	Log jams, sill, and digger large wood structures constructed; 30 primary pools excavated.
Road Rehabilitation	Three miles of riparian native surface road closed, scarified two to four inches, and converted to foot trail. Stream crossings were restored and banks were recontoured.
Erosion Control	Plant native grasses.
Forest Restoration	Plant 1,250 conifers and 3,000 shrubs through out planning area with a species mix to match adjacent forest.

Monitoring of the project is also underway. Monitoring projects include follow-up Level II stream surveys, photo points, cross sections, longitudinal profile, pebble counts, erosion pens, stream shade, stream flow and water temperature.

Fish Passage at Culverts (Forest-wide)

Techniques to evalute adequacy and design of culverts to pass juvenile and adult fish has improved the past few decades. The Forest undertook a Forest-wide survey in 1999, 2000, and 2001 to evaluate and rank all culverts for their ability to pass juvenile and adult fish. An index list of surveyed sites has been prepared. The list provides a priority directory of projects to repair or replace.

In 2001, funding was available to complete the following projects:

- Pinnacle Creek culvert Clear Branch watershed
- Cub Creek culvert, Upper Clackamas watershed
- Last Creek culvert, Upper Clackamas watershed
- Bear Creek culvert, Sandy River watershed

View of Pinnacle Creek with old culvert. About 2,500 cubic yards of fill was removed to restore the stream channel.

Engineers prepare to pull what remains of the 130 foot culvert. Laurance Lake is in the background. Bull trout now may freely access Pinnacle Creek at all lake levels, which fluctuates up to 8-10 feet depending on downstream water needs. The new streambanks were planted with native grass seed.

Nottingham Campground (Hood River Ranger District)

Forest visitors prefer camping near streams or lakes. Problems to water quality and fisheries may arise if there is degradation of riparian resources at campsites. At the Nottingham Campground on the Hood River Ranger District there was a concern because an increasing percentage of soils in the area was becoming compacted from campsite expansion and use, and sanitation facilities were not meeting the needs of visitors.

Fisheries and Recreation staffs addressed these problems by implementing a variety of restoration projects. These include:

- Defining and hardening campsites,
- Putting down a gravel base at parking sites,
- Improving the entrance to the campground to contain traffic,
- Improving sanitation with installation of two additional toilets, and
- Expanding the campground away from riparian areas.

Newly "hardened" campsite with defined parking area. East Fork Hood River is in the background.

Arrah Wanna (Zigzag Ranger District)

Arrah Wanna is a homeowner community on the Salmon River. Twenty homes are built on the former main stem of the Salmon River. The main stem has been diverted, and the homeowner community now borders a half-mile side channel and pond complex. In 2001, 21 rock and log structures (in-channel and flood plain) were constructed, four snags for bird roosting were installed, an old log stringer bridge that was a partial passage barrier was removed, and a half acre wetland from a sediment filled swimming pool was created. This project has many partners, including the Arrah Wanna Homeowners Association, the Sandy River Watershed Council, Oregon Department of Fish and Wildlife, and U. S. Fish and Wildlife Service.

A similar project nearby involving the Resort at the Mountain has been going on since 1996. Since then, coho have recolonized the channel. In 2001, at least 18 adult salmon were seen swimming and spawning in Wee Burn Creek.

Burnt Lake Shoreline Restoration (Zigzag Ranger District)

This project restored shoreline areas degraded by recreational over-use at a popular camping and fishing site. Burnt Lake supports populations of rainbow trout, cutthroat trout, and brook trout but its shorelines are being degraded by overuse. In 2001, one acre of lake shoreline was restored, campsites near water were closed, new trails away from the lake were brushed, and access to some shoreline areas was restricted. In the long term, the rehabilitated areas will reduce overall surface runoff into the lake, restore riparian function, and improve water quality.

Planning and Support

FERC Relicensing

After a 30- to 50- year license term, a hydroelectric project licensed by the Federal Energy Regulatory Commission (FERC) is reviewed for relicensing. Biologists on the west side of the Forest are involved in relicensing five projects owned by Portland General Electric (PGE) (see Table 5).

Table 5. Location of Hydroelectric Plants with Forest Relicensing Participation.

Plant(s)	River Basin	License Expiration Date	Assumed New License Term	Forest contact
Oak Grove	Clackamas River	08/31/06	30 years	Tom Horning
N. Fork, Faraday, and River Mill	Clackamas River	08/31/06	30 years	Tom Horning
Marmot and Little Sandy	Sandy River	11/16/04	N/A*	Duane Bishop

**Marmot and Little Sandy dams are being planned for decommissioning in 2007-2008.*

Relicensing hydroelectric projects is complex, as applicants and affected resource interests strike a balance between power and non-power benefits, while considering all resource issues at stake. PGE and the licensing participants are using an alternative licensing process to negotiate through the many complicated steps. The alternative licensing process uses a collaborative approach to involve the public, local, state, and federal agencies (including the Forest), and others, earlier in negotiations than through traditional relicensing.

Survey and Manage Program (Forest-wide)

As the Forest Service has shifted to ecosystem management, the amount of information collected prior to planning and implementing projects has increased significantly. Planning ground disturbing activities such as timber sales, recreation improvements or fish habitat projects requires extensive ground surveys. The 1994 Northwest Forest Plan identified many species of plants and animals requiring special survey techniques to detect their presence. The species are commonly called "C-3" species, referring to the name of the table where they are listed in the Northwest Forest Plan. Fisheries staff are responsible for the survey of two aquatic mollusks – the Columbia dusky snail (*Lyogyrus n. sp.1*) and the Basalt Juga (*Juga Oreobasis n.sp. 2*). The results of surveys in 2001 for C-3 species are displayed in Table 6.

Table 6. Results of 2001 C-3 Mollusk Surveys.

District	Number of Sites Surveyed	Number of Sites with *Lyogyrus*	Number of Sites with *Juga oreobasis*
Hood River	9	2	0
Clackamas River	16	4	0
Zigzag	1	0	0
Barlow	36	0	0

When a C-3 species is found, a project may be modified to protect the species. Generally, the standards and guidelines of the Northwest Forest Plan provide adequate restrictions, but additional measures may be taken to insure protection of water quality and habitat.

Monitoring and Inventory

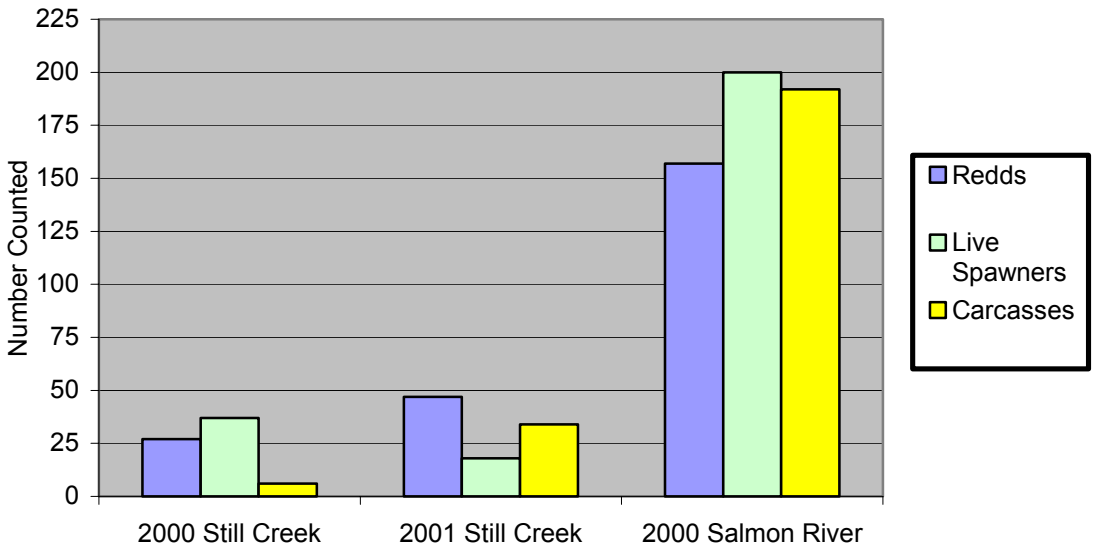
The center of the monitoring and inventory program is the Forest-wide, Level II Stream Survey Program. Stream surveys provide us with a "snapshot" of current stream conditions. Survey data is used to identify potential restoration projects and to determine the extent of fish distribution across the Forest. In 2001, 34 miles of stream were surveyed, inventorying fish habitat features such as pool depth and stream bank stability.

Many fish habitat and stream restoration projects are accompanied by a monitoring plan. Biologists use the information gathered to determine if the project met objectives (such as increasing stream habitat complexity or reducing stream temperatures) and make changes to future project designs.

Adult Steelhead/Chinook Spawning Surveys (Zigzag Ranger District)

A standardized method to monitor numbers of steelhead and chinook redds at index reaches on Still Creek and the Salmon River began in 2000. Spawning surveys are conducted each spring and summer for winter steelhead and spring chinook. Figure 2 displays the results. Still Creek counts are from index reaches, and the Salmon River count is taken from a 14-mile section from the mouth to Final Falls. Winter steelhead redd counts in 2000 and 2001 were not enumerated because of high flows in both of those years. Additional index reaches are planned for the Upper Sandy River Basin in 2002.

Figure 2. Chinook Spawning Index Reach Monitoring Upper Sandy Basin, 2001.

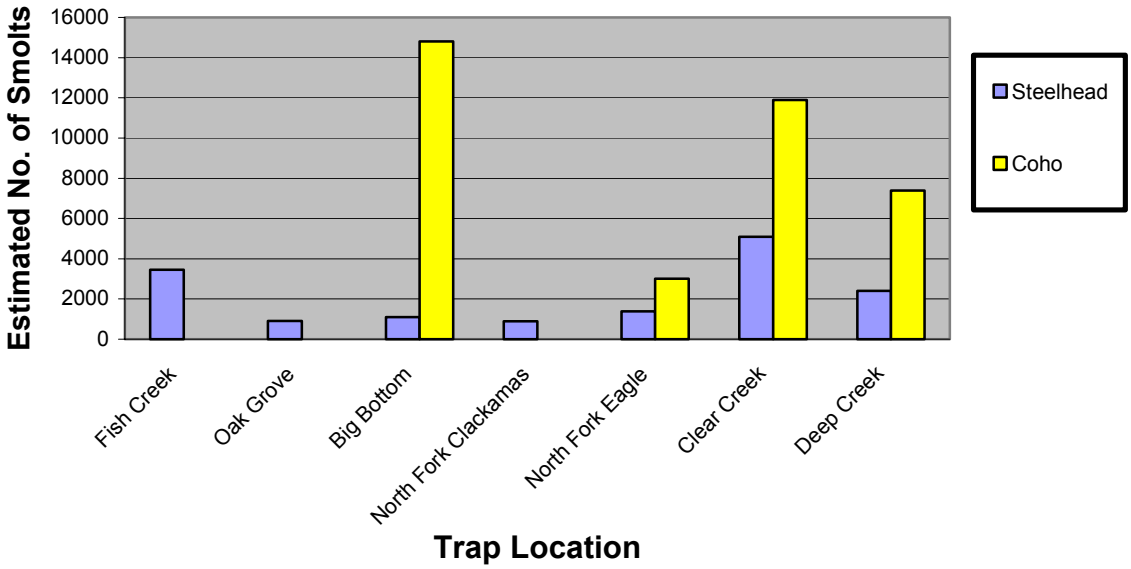


Clackamas River Fisheries Restoration
(Clackamas River Ranger District)

Since 1993, a consortium of fish biologists from federal, state and private organizations has partnered to address fish management issues on the Clackamas River. In 2001, the Clackamas River Ranger District continued its role as a principal partner. Biologists led efforts to:

- Monitor out-migrating smolt populations through a system of six rotary smolt traps at locations throughout the Clackamas River Basin. Four are on the Forest and two are operated off the Forest. All fish caught are enumerated, and population estimates are completed for Pacific salmon and steelhead. Figure 3 displays the results of the 2001 trapping season.

Figure 3. Clackamas River Fish Traps Year 2001.



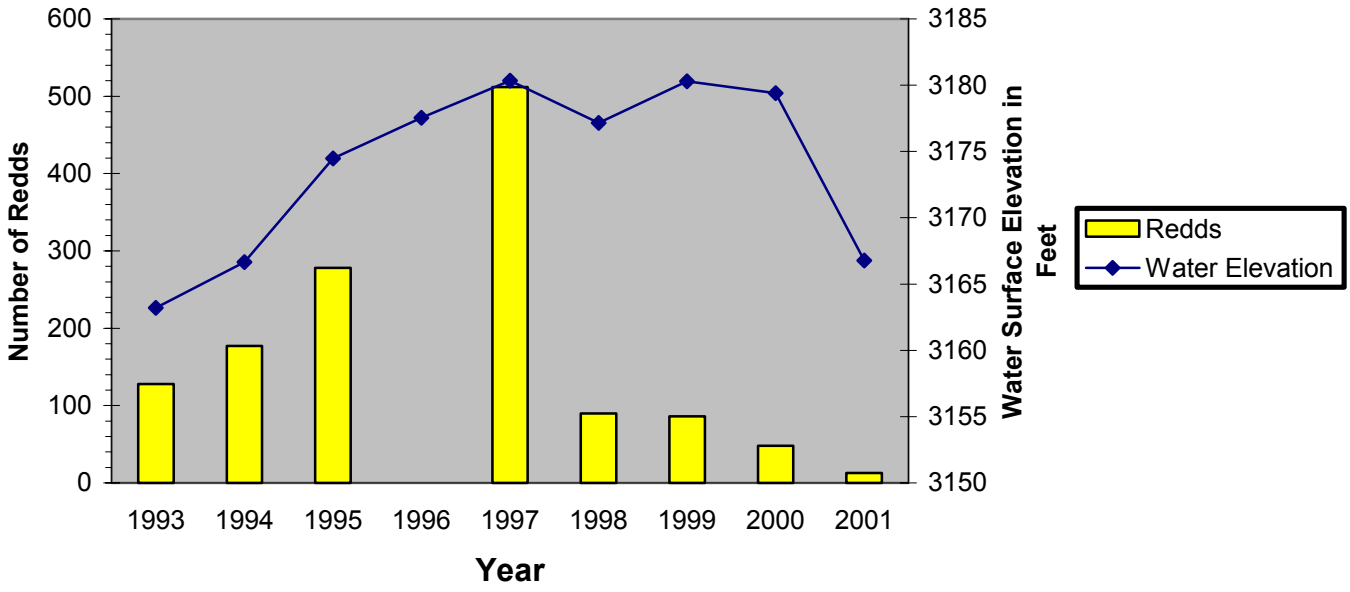
- Conduct a modified Hankin and Reeves survey of the Oak Grove Fork Clackamas between the barrier falls at rivermile 3.8 and Harriet Lake Dam to generate a population estimate for all salmonids present. Approximately 1 mile of stream was surveyed. Based on sampling, an estimated 1,030 cutthroat trout and 25 brown trout were residing in this stream reach.
- Monitor movements into and out of an artificial side-channel. Three hundred eight chinook and 455 coho are estimated to have emigrated as smolts from the side-channel in the spring of 2001. Size and condition of smolts emigrating from the side-channel did not differ significantly from smolts wandering into the channel from the mainstem.
- Evaluate the productivity of four subbasins by measuring the growth of biofilms on clay tiles placed in each stream. Fish Creek was found to grow biofilms at several times the rate of Big Bottom and the Oak Grove Fork in the early fall. North Fork Clackamas suffered scouring flows prior to sampling. Over the course of several weeks, Fish Creek biofilm productivity declined to levels comparable with the other basins. Big Bottom productivity alone increased over that time.

Bull Run Lake Cutthroat Trout Monitoring (Zigzag Ranger District)

In 2001, the Zigzag Ranger District continued annual monitoring of cutthroat trout spawning in the tributaries of Bull Run Lake, as required under the Bull Run Lake Mitigation and Monitoring Plan. The lake, used as a source of drinking water by the Portland Water Bureau, has a unique, naturally reproducing wild population of coastal cutthroat trout. Because cutthroat trout are the only fish in the lake, this population is pure and is not subject to hydridization with other fish.

The drought during the winter of 2000-01 resulted in the lowest lake levels since 1993. Spawners had difficulty accessing spawning streams. As a result, tributary redd counts were the lowest since monitoring began in 1998 (see Figure 4).

Figure 4. Bull Run Cutthroat Trout Redd Monitoring



Winter Steelhead Spawning Surveys
(Barlow and Hood River Ranger Districts)

Since 1985, winter steelhead surveys have been conducted in the Fifteenmile Creek Watershed. Fifteenmile Creek, Ramsey Creek, and Eightmile Creek have been surveyed since 1985, and Fivemile and Middle Fork Fivemile creeks were added in 1992 and 1993, respectively. Surveys have been conducted in conjunction with Oregon Department of Fish and Wildlife wild winter steelhead surveys conducted off-Forest.

In addition, for the first time in a decade, winter steelhead spawning surveys were conducted in five streams in the Hood River Watershed. Results are shown in Table 7.

Table 7. Winter Steelhead Spawning Surveys on the Eastside of the Forest.

Stream Name	Total Miles of Stream Surveyed	Number of Steelhead Redds	Number of Adults (carcass or live)
Fifteenmile Creek	8.1	16	6
Ramsey Creek	7.5	6	4
Eightmile Creek	4.5	3	0
Fivemile Creek	0.2	00	0
Middle Fork Fivemile Creek	0.8	0	0
Tributaries to Middle Fork and West Fork Hood River	5.46	21	4

Results from surveyed reaches show densities twice as high in Hood River reaches as in the Fifteenmile Creek Watershed (5.07 redds/mile compared to 2.90 redds/mile). Historical low water levels may have reduced access to higher elevation, interior streams in the Fifteenmile Creek Watershed.

Teachers in the Woods (Zigzag Ranger District)

A unique tool the Forest uses to accomplish monitoring tasks is the cooperative program "Teachers in the Woods." In 1995, a partnership was formed with Portland State University to provide continuing education to science teachers in junior and senior high schools. The Fisheries Program obtains funding, manages the challenge cost share aspect of the program, and provides supervision on the Forest. The District provides supervision, staffing, coordination, scheduling, planning, implementation, and the annual progress report.

A portion of the program is training the teachers in monitoring techniques, but the overall goal is to accomplish needed monitoring, and introduce or enhance their understanding of the scientific inquiry process so teachers can integrate it into their own classroom curricula. Twenty-eight teachers participated in the Teachers in the Woods program in 2001. Nine teachers were assigned to the Forest. Work crews of two to four teachers assisted Forest Service personnel in monitoring 10 different types of projects on the Forest. Projects ranged from collecting data on stream restoration to monitoring songbird populations.

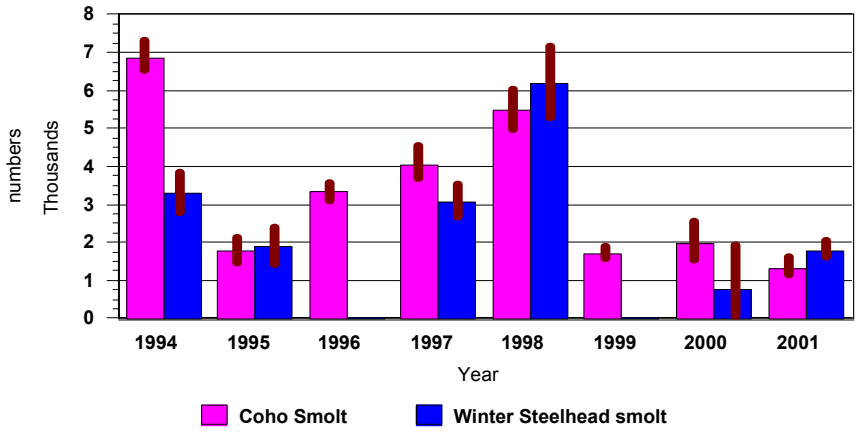
Teacher Steve Rowland collects stream survey data on Tanner Creek.

Upper Sandy River Basin Smolt trapping (Zigzag Ranger District)

In 2001, The Zigzag Ranger District intensified monitoring of smolt production in the Upper Sandy River Basin with the addition of a second rotary screw trap on Lost Creek. In conjunction with the Still Creek trap, the additional data set will provide increased accuracy for monitoring recovery of Upper Sandy River Basin stocks of threatened steelhead trout and coho salmon.

Population estimates for coho and steelhead at the Still Creek trap for 1994-2001 were completed in 2002 and are presented in Figure 5 below. This data will also be incorporated into the Ecosystem Diagnostic Treatment (EDT Method) for modeling productivity in the Sandy Basin. Figure 5, below, shows population estimates and 95% confidence intervals for coho and steelhead at the Still Creek Trap, 1994-2001.

Figure 5. Coho and Steelhead Smolt Production, Still Creek.



Environmental Education

Fish biologists work actively with local communities to interpret and share information about the Forest and the fisheries resource. This is done through presentations, classroom and outdoor activities, sponsoring gatherings such as the Oxbow Salmon Festival and fishing clinics, and development of brochures and videos.

Cascade Streamwatch (Zigzag Ranger District)

"Cascade Streamwatch" (CSW) is an innovative outdoor aquatic ecology education program, which uses professional, natural resource biologists/specialists as mentors to students from inner-city schools and under-served communities in Oregon and southwest Washington. Conceived by USDA Forest Service biologists in 1990, the goal of CSW is to increase students' understanding of Cascade mountain watersheds/stream ecosystems and raise awareness of how public actions can affect these watersheds. The program uses a science-based curriculum in which students are active participants in the investigation of these aquatic ecosystems. The foundation of the program is the professional biologists and natural resource specialists from the USDA Forest Service and other agencies who 'mentor' the students and provide them with insight, training, and experience. Students benefit by taking part in monitoring different environmental parameters such as water quality, macroinvertebrate assemblages, salmon life cycles, and streamflows.

Objectives of CSW are to:

- Heighten student's awareness and appreciation of Pacific Northwest aquatic ecosystems,
- Ignite interest and cultivate skills in science and math,
- Provide a curriculum that supplements and enhances classroom studies, and
- Develop and maintain ecosystem monitoring programs which support community efforts to restore fish and wildlife habitats in the Pacific Northwest.

Currently, there is a waiting list for schools wishing to participate in the program. In 2000-2001, the program served over 5,600 students from over 100 schools in the greater Portland area.

Fishing Clinics (all Ranger Districts)

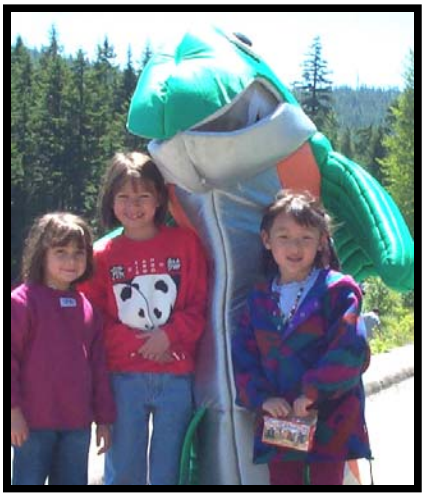
In celebration of National Fishing Week, four fishing clinics were hosted on the Forest in 2001. Over 1,000 children and adults attended. Many partners; including fishing groups, national and local businesses, service organizations and individuals; participate in hosting these events. Activities include fishing instruction, angling ethics, environmental education, aquatic insect identification, knot tying and rigging, casting contests and fish identification.

Kids enjoy the day at the Zigzag Ranger District Fishing Clinic held June 15th at Trillium Lake.

Oxbow Salmon Festival (Zigzag Ranger District)

The Forest is a major sponsor of the Oxbow Salmon Festival; celebration of the return of salmon every October at Oxbow Park along the Sandy River. The Forest participates on the steering committee for the festival along with partners from Metro, Portland General Electric, and Oregon Trout.

Fisheries personnel provide staffing, coordination, planning, and implementation for the event. During the festival, the Forest hosts the children's activity tent, informational booths on fisheries, hydrology, and environmental education, and a giant salmon-shaped tent that allows seating of 30-35 children for storytelling. The highlight of the festival in 2001 was viewing spawning chinook salmon on the Sandy River. The good weather and large fish return made viewing the spawning salmon better than in previous years. Approximately 10,000 attended the festival in 2001.



Right: Frank Salmon gives Oxbow Salmon Festival visitors a big fish squeeze.

Salmon Watch
(Zigzag and Clackamas River Ranger District)

In 2001, personnel from the Forest participated in another season of Salmon Watch, an educational program organized by Oregon Trout. The goal is to educate local school children on the importance of healthy watersheds and aquatic ecosystems. Conducted during the fall return of chinook salmon, outdoor classrooms are held on the banks of the Salmon River and Clackamas River. Students witness firsthand the annual return of the salmon, observe spawning, and learn about salmon life cycles, the importance of clean water, and the elements of a fully functioning forest/aquatic ecosystem. In 2001, personnel from the Zigzag Ranger District conducted 10 educational sessions with six Portland area schools, and personnel from Clackamas River Ranger District hosted five educational sessions with four local schools.

Salmon Life Cycle Game (Forest Headquarters)

Salmon Life Cycle Game Board.

Ten years ago, a game based on the life cycle of the Pacific salmon was developed on the Forest. In 2001 the Forest received a grant to upgrade and redesign the game. Willamette National Forest Artist Irene Stumpf produced background art displaying the different environments a salmon travels through during its lifetime, simplified the game, and added a few new elements (such as a three-dimensional dam). Ten copies of the game have been printed on a waterproof, durable material, and are ready for many more years of environmental education.

Mt. Hood National Forest Recreational Fishing Website (Forest Headquarters)

In 2001, the Pacific Northwest Regional Office hired a website design company to complete a recreational fishing opportunities web page for all Forests in Region 6. Visitors to the website find a listing of favorite fishing lakes and streams on the Forest. Information includes the size and accessibility of the site, species of fish stocked (or naturally reproducing), adjacent camping facilities and type of watercraft allowed. There is also information on local services such as local Forest Service permitted resorts. The web site is found at: http://www.fs.fed.us/r6/fishing/forests/mth/index.html.

Volunteer Environmental Education Program (Zigzag Ranger District)

To address funding and staffing decreases the Zigzag Ranger District, the Fisheries Program began a volunteer-environmental education program in 2000. Operating under a simple 'individual' or 'sponsored' voluntary agreement, the volunteer program fulfills two primary needs:

- Provides environmental educational opportunities for Portland-area high school and college students and organizations; and
- Provides additional personnel for the Zigzag fisheries crew to complete planned field projects.

In 2001, over 90 volunteers from Portland-area schools and colleges, the Boy Scouts, Americorps, the Mazamas, and individuals from both the local and greater-Portland areas participated in the program. Supervised by Forest personnel, volunteers assisted with smolt trap operations, restoration planting, and spawning surveys. As part of their experience, volunteers were also encouraged to participate in district meetings, safety sessions, and fish department meetings.

Right: Boy Scout volunteers replant disturbed riparian areas along the Clear Fork of the Sandy River.

Watershed Stewardship Education Program (Clackamas River Ranger District)

Fisheries staff at the Clackamas River Ranger District, in conjunction with the Oregon State University Extension Service, participated in a watershed stewardship education program. Staff served as trainers to new watershed stewards teaching salmonid biology in classroom and outdoor settings.

Staffing and Funding

Headquarters

Dan Shively, *Forest Fish Biologist (503) 668-1605*
Tracii Hickman, *Fish Biologist (located at Sweet Home Ranger Station)*

Hood River and Barlow Ranger Districts

Gary Asbridge, *Zone District Fish Biologist (541) 352-6002*
Chuti Fiedler, *Assistant District Fish Biologist – Hood River*
Chris Rossel, *Assistant District Fish Biologist – Barlow*
Summer Crew – *Hood River* - Kathryn Arendt, Heidi Vogel, Richard Penvalas, Tony DePinto, Ruth Caulk; *Barlow* – Darcy Morgan, Carey Nelson

Zigzag Ranger District

Duane Bishop, *District Fish Biologist (503) 622-3191*
David Saiget, *Assistant District Fish Biologist*
Summer Crew – Courtney Newlon, Loren Meagher, Brian Neilson, Fran Gray, Amanda McKinney

Clackamas River Ranger District

Tom Horning, *District Fish Biologist (503) 630-8798*
Bob Bergamini, *Assistant District Fish Biologist*
Sue Helgeson, *Fish Biologist*
Burke Strobel, *Fish Biologist and PNW Liaison*
Floyd Walker, *Fish Technician*
Summer Crew – Mikias Tizazu (Hutton student), Mark Schoenborn, Amanda Robillard, Megan Hatfield

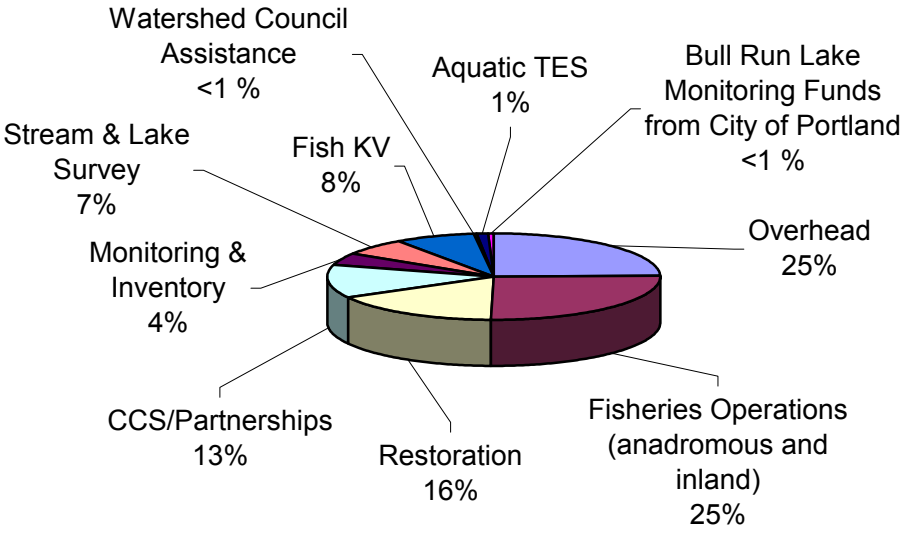
Stream Survey Program

Katie Serres, *Program Coordinator (503) 630-8784*
Stream Survey Crew – Rose Christensen, Robin Miranda, Aaron Hook, Danielle Moreau, Jeff Woltering (Hutton student)

The 2001 Stream Survey crew.

The total Fisheries Program budget for the Forest in 2001 was $1,130,467. No Stone Creek Hydro mitigation funds were expended in 2001. Figure 6 displays the various allocations.

Figure 6. Fisheries Budget Year 2001



Thank You to our Many Partners!

- Farmers Irrigation District
- Middle Fork Irrigation District
- Oregon Department of Fish and Wildlife
- National Marine Fisheries Service
- U. S. Fish and Wildlife Service
- Portland Water Bureau
- Wolftree, Inc.
- Portland State University
- Mt. Hood Community College
- Bureau of Land Management
- Resort at the Mountain
- Portland General Electric
- Confederated Tribes of Warm Springs
- Oregon Trout
- Estacada High School
- Clackamas River Water Providers
- Arrah Wanna Home Owners Association
- Trout Unlimited – Tualatin Valley and Clackamas River Chapters
- Metro
- Oregon Department of Fish and Wildlife Clackamas and Sandy River Hatcheries
- Cleveland High School
- Catlin Gabel High School
- Boy Scouts of America – Camp Baldwin
- Sandy River Basin Watershed Council
- Hood River Watershed Group
- Clackamas River Watershed Council
- White River Watershed Council
- Fifteenmile Watershed Council
- Hood River County Soil and Water Conservation District
- Wasco County Soil and Water Conservation District
- National Resources Conservation Service
- Oregon Department of Environmental Quality
- Centennial, Grant, Reynolds and David Douglas High Schools
- The Nature Conservancy
- Clackamas County Water Environment Services
- Oregon State University Extension Service
- Eagle Creek National Fish Hatchery
- Mazamas Wilderness Volunteer Program
- Badger Improvement District
- Lost/Boulder Irrigators
- Deschutes Resource Conservancy