United States Department of Agriculture

Forest Service

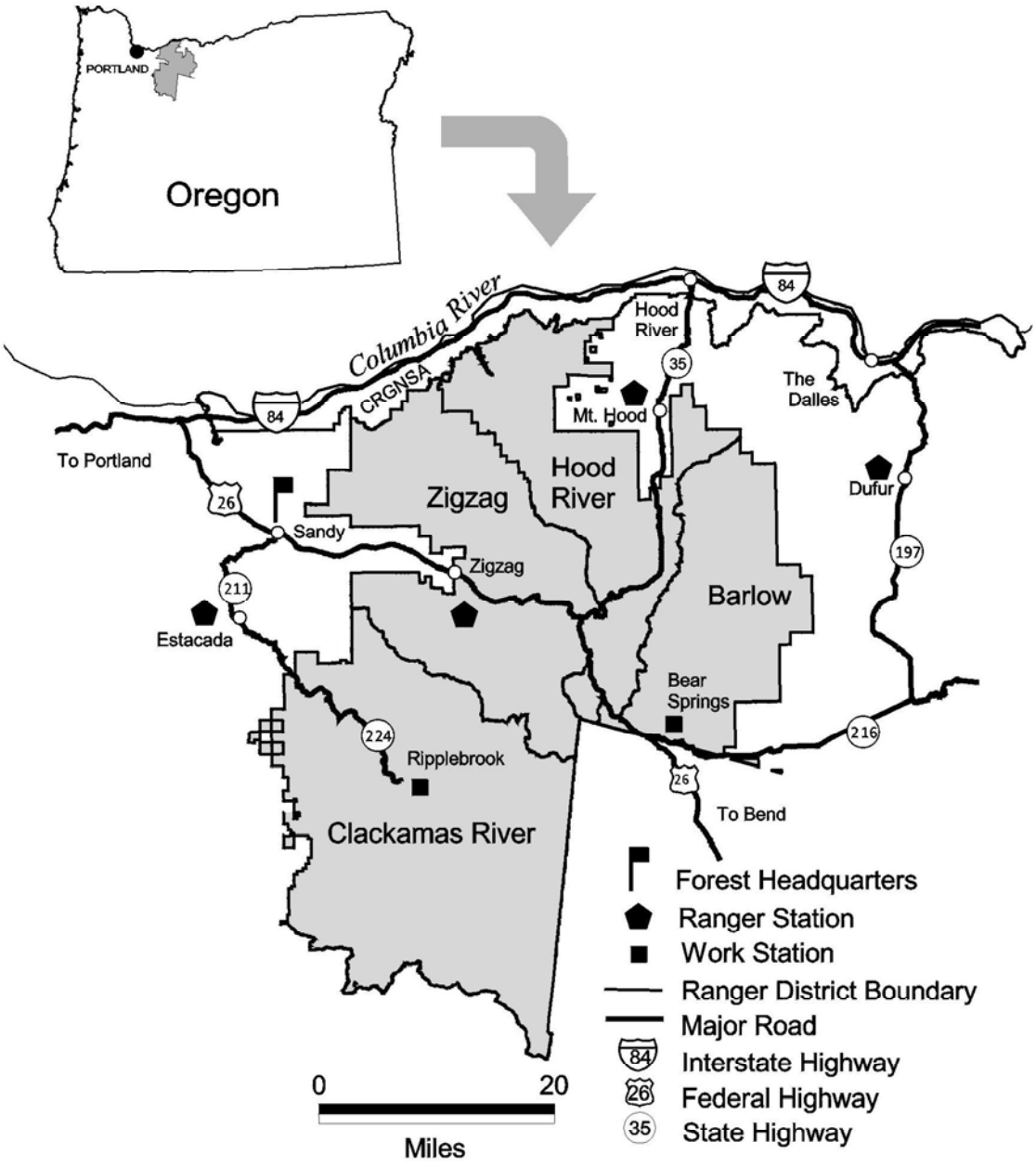
Pacific Northwest Region

2003

Fisheries Program Accomplishment Report

Mt. Hood National Forest
2002

Mt. Hood National Forest Vicinity Map



Front cover photos celebrate our work with our partners (see inside for more details):

Upper Left: High school students assist in salmon smolt monitoring on Still Creek, Zigzag Ranger District.

Upper Right: Four fishing clinics are held annually on the Forest, including one at beautiful Trillium Lake.

Middle Left: Storyteller Anne Rutherford entertains children inside the Salmon Tent at the Springwater Festival.

Middle Right: Trout Unlimited volunteers plant trees along Anvil Creek, Clackamas River Ranger District.

Bottom Center: Teachers in the Woods assist in monitoring projects. Here, teachers measure stream bed elevations in Multnomah Creek at Multnomah Falls, Columbia River Gorge National Scenic Area.

Welcome to the 2002 annual report for the Mt. Hood National Forest Fisheries Program. This document highlights the excellent work and accomplishments of many components of the Fisheries Program in fiscal year 2002 (FY02) on the Mt. Hood National Forest (the Forest). If you are interested in additional information about a program or activity described in this document, please contact the personnel listed at the end of the document or the office listed below.

The report is organized with a page recognizing a personal success from biologists on each Ranger District and the Headquarters Office. Program area accomplishments follow, and then a summary of the budget and fisheries personnel.

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Mt. Hood-Parkdale, OR 97041

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Zigzag, OR 97049

Table of Contents

Piping irrigation ditches conserves water for the benefit of fish and other aquatic resources.

Barlow Ranger District

Piping Ditches to Save Fishes

"Now more than any time in our history, is it more important to work as a community to accomplish a common goal."

Chris Rossel,
Barlow Fisheries Biologist

Lost Boulder and Rock Creek Ditches

During development of agricultural lands on the semi-arid east side of the Forest, irrigation ditches were constructed to divert water from forest streams to lowland farms. Besides the reduction of in-stream flows, consequences of ditching water from streams includes the entrapment of fish and loss of water through infiltration and evaporation.

Partners from Wasco Soil and Water Conservation District, local irrigation districts, the Deschutes Resources Conservancy, Oregon Department of Fish and Wildlife, and the Forest Service are all working to improve efficiency of irrigation ditches and, where possible, keep more water in streams to benefit fish and other resources.

In 2002, two major piping projects were completed on the Barlow Ranger District. One was the Lost Boulder Ditch near the White River. A major partner was the Deschutes Resources Conservancy (DRS), a community-based non-profit organization dedicated to restoring stream flows and improving water quality in the Deschutes Basin. A method to increase stream flow is to improve irrigation efficiency to meet the water allocation, and then keep saved water in the stream. DRS contributed funding to pipe 2,250 feet of the Lost Boulder ditch, and water saved by piping is now retained in Boulder Creek.

The other project is located on Rock Creek. From the intake at Rock Creek Reservoir, a length of pipe 1,700 feet was placed down to Forest Road 48 to stop leaking and conserve water. Access to the intake valve required a reservoir drawdown. A 24-inch pipe was slid inside the existing pipe, and a new control gate was installed. It is estimated there will be an annual savings of 178 acre-feet of water per year.

After draining the reservoir, fish concentrated in the remaining pool were seined and moved to private ponds. It is estimated 90% of the captured fish were large and smallmouth bass, 5% were bluegills, and, surprisingly, only 30 rainbow trout were found.

Rock Creek Reservoir was drained to allow replacement of a new control gate. Photos courtesy of Wasco County Soil and Water Conservation District.

Trout Unlimited volunteers stand by a good days work after planting 300 Douglas fir and white pine seedlings along Anvil Creek.

Clackamas River Ranger District

The Importance of Partnerships

"Volunteers such as our partners at Trout Unlimited come and complete small, but important projects in one or two days. It's productive work that could get overlooked because of the size, but with volunteers it gets done."

Tom Horning,
Clackamas River Fisheries Biologist

Anvil Creek Tree Planting

One brisk Saturday morning last spring, volunteers from the Clackamas River and Tualatin Valley chapters of Trout Unlimited (TU) strapped on tree-planting bags and grabbed some hoe-dads for a day of tree planting. A road crossing at Anvil Creek had washed out during the 1996 flood. After determining the road was no longer needed, the road was obliterated and the stream crossing restored. TU members came back to finish the project, planting trees along the streamside and up the adjacent slopes. The trees planted will accelerate establishment of the forest conditions once found along this stream, providing shade, bank stability and future large wood.

Estacada Forestry and Natural History School

"It's a chance to support our local community and help kids understand and value the forest in their backyard."

Tom Horning

In partnership with the Estacada School District and Oregon Trout, fish biologists from the Clackamas River Ranger District assisted in field trips for local junior and senior high school students to nearby public lands. Students spent time in the woods learning forest ecology and salmon biology.

Tom Horning is wearing cool shades and viewing steelhead with students. Photo courtesy of Oregon Trout.

Hood River bull trout.

Hood River Ranger District

Describing, Restoring, and Protecting Habitat of Threatened Fish

"It is important for our program to identify, protect and restore habitat for fish populations with low numbers. We use monitoring information to correct problems on the ground."

Gary Asbridge,
Hood River Fisheries Biologist

The Pinnacle Creek Success Story

Replacing fish passage barrier culverts and opening up blocked habitat is critical to recovery of threatened and endangered fish. Hood River fisheries personnel celebrated an achievement in 2002 when bull trout, listed as Threatened under the Endangered Species Act, were found in newly opened stream stretches on Pinnacle Creek. Two problem culverts were recently replaced, and surveys in 2002 found high densities of bull trout in reaches with improved access, and for the first time, in a stream reach above a replaced barrier culvert.

Clear Branch Habitat Restoration

Bull trout thrive in habitat with cool water and complex habitat. In the late 1990's, fish biologists identified instream habitat restoration opportunities for bull trout above Laurance Lake in Clear Branch Creek. An abandoned side channel was re-opened, and the stream channel was reconstructed. During effectiveness monitoring this summer, surveyors found the highest densities of bull trout ever recorded in Clear Branch Creek while snorkeling the restored stream reaches.

North Fork Mill Creek Steelhead

Wild winter steelhead in North Fork Mill Creek.

North Fork Mill Creek joins Mill Creek seven and one-half miles southwest of the City of The Dalles. Prior to 2002, no formal surveys had been completed in North Fork Mill Creek, although anecdotally it was believed to host steelhead. A formal spawning survey was conducted on three miles of stream managed by the Forest Service. Five redds and nine steelhead adults were found in a stream that previously had no documented population. It is believed these fish are wild winter steelhead from the Mid-Columbia stock of threatened fish. Investigations will continue to determine their origin.

Near Wee Burn Creek, Wilderness Volunteers clear Japanese knotweed, an invasive non-native plant.

Zigzag Ranger District

Restoring Salmon Friendly Habitat in the Salmon River

"We are conducting cutting-edge fisheries, restoration and conservation education through partnerships and volunteerism."

David Saiget,
Zigzag Fisheries Biologist

Salmon and Golf and Wee Burn Creek

A long-term partnership between the Resort at the Mountain and the Zigzag Ranger District fisheries department is working to make the Resort's golf course friendly to salmon. Over the years, the two partners have worked together to restore Wee Burn Creek, which prior to restoration flowed through a pipe in the middle of the golf course. Partners were thrilled in 2001 when coho salmon were found for the first time in the newly excavated stream.

In 2002, Wilderness Volunteers provided a crew of 11 to continue work improving conditions around Wee Burn Creek. Over three days the crew planted native species, dug up exotic Japanese knotweed, replanted the area with native species, and improved fish passage at a golf cart bridge.

Arrah Wanna

Before: In 2001, a swimming pool near the Salmon River was excavated and the areas were converted to a wetland.

Arrah Wanna is a homeowner community bordering one of the few remaining side channels on the Salmon River. Over the past several years, homeowners have worked alongside partners to improve conditions in this rare, important side channel. During the 2002 project, Sandy River Basin Watershed Council members and the homeowner's association planted streamsides with native willow, cedar and Douglas fir and controlled erosion with native grass seed.

After: In 2002, a rock weir was constructed to raise water levels in the restored wetland.

Demonstration flows on the Oak Grove Fork display the range of impact of the different flow regimes. Each photo illustrates a doubling of flow. Photos courtesy McBain and Trush, Inc.

10 cfs

Headquarters

Protecting In-stream Flows for Long Term Watershed Health

"Through new in-stream flow study technologies we hope to open the door wider to add benefit to fish resources here and throughout the Pacific Northwest."

Dan Shively,
Headquarters Fisheries Biologist

Hydroelectric Relicensing on the Clackamas River

Working with fisheries staff from the Clackamas River Ranger District, the Forest concluded a productive year implementing two critical and innovative in-stream flow studies on the lower Oak Grove Fork. Working with the licensee, Portland General Electric (PGE), and other participants in this collaborative Federal Energy Regulatory Commission (FERC) relicensing effort, the Forest participated in a new and unique habitat mapping, in-stream flow study.

Operating in two interagency teams, we evaluated habitat availability for ESA listed salmon and steelhead at predetermined flow releases. In addition, working with our own Forest Service consultant, we initiated a 2-dimensional, in-stream flow study to more thoroughly evaluate impacts to resources at a much broader ranger of flow regimes.

The integration of these and other studies will be pivotal in the future negotiations for PGE's new FERC license. In-stream flows in the lower Oak Grove Fork are apt to be the most paramount and financially impacting issue for natural resources on these federal lands.

61 cfs

135 cfs

265 cfs

Monitoring stream bed elevations in Multnomah Creek at Multnomah Falls will help guide projects to reduce high water hazards to visitors at Oregon's most popular tourist site.

Fish Conservation

On the Forest there are several species of Pacific salmon and resident trout with declining or extremely low populations. The fish species in Table 1 are listed under the Endangered Species Act (ESA) as threatened, or are candidate species for ESA listing.

In 1999, coastal cutthroat trout were proposed under the ESA as a threatened species. The U.S. Fish and Wildlife Service announced in June of 2002 that coastal cutthroat trout do not warrant listing.

Table 1. List of Threatened Fish Species on the Mt. Hood National Forest in 2002.

Species	Evolutionarily Significant Unit
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
Bull Trout	**Listed Threatened** Columbia River Distinct Population Segment 5/98

Any federal action that may affect listed fish species; such as harassing, collecting, or changing habitat (commonly known as "take"), must go through the consultation steps listed in the ESA. The Forest consults with two federal regulatory agencies, U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS).

Programmatic Consultation in Northwest Oregon

(Headquarters)

Routine and ongoing management actions on federally managed lands, such as campground and road maintenance, require consultation with NMFS and FWS. To expedite the consultation process, the federal agencies developed a process to determine the effects of routine and ongoing management actions in a programmatic manner.

Since our previous programmatic biological assessment expired in the fall of 2002, a collaborative effort was undertaken between the Forest Service, Bureau of Land Management, Fish and Wildlife Service and National Marine Fisheries Service to produce a new programmatic document. The Mt. Hood National Forest played a leading role in the effort by providing a biologist to work full-time on the project for five months as writer/editor. The document was completed in late summer of 2002. The new programmatic will be in effect for another five years.

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.

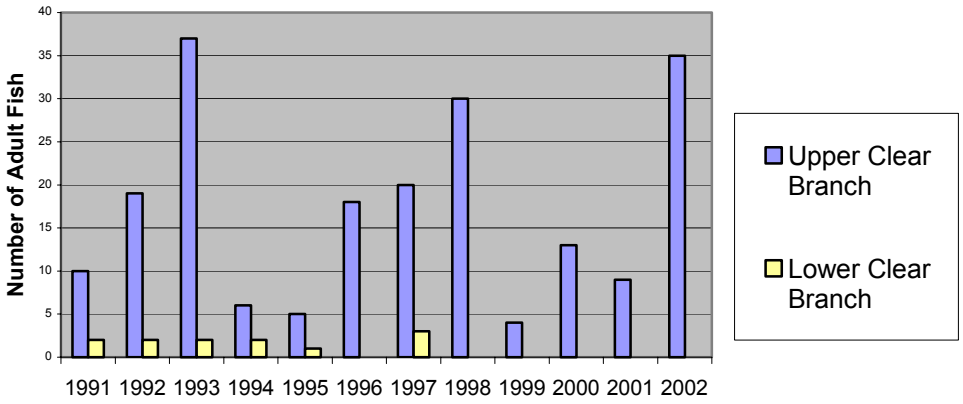
Snorkeling is the primary survey technique for monitoring bull trout populations in tributaries of the Middle Fork Hood River. Snorkeling at night is the most successful for consistent juvenile censusing. Night snorkeling is used for all exploratory surveys to find new populations within the Hood River Basin. The results of the annual counts are displayed in Figure 1. Index reaches were snorkeled at night for the first time in 2002. In the past, day snorkeling was conducted in Clear Branch Creek for the annual count of upstream adult migrants. The district has now switched to night snorkeling only. It is the fifth consecutive year that 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 side channel was re-opened, creating high quality bull trout habitat. Two subreaches in the project areas were established in 2001 as index reaches. Juvenile densities in the index reaches in 2002 were the highest ever found since the bull trout monitoring program began.

Redd surveys are repeated annually in low gradient, non-glacial streams to establish spawning index rates. In 2002, eleven bull trout redds were found in Clear Branch, ten above Laurance Lake and one below. Two bull trout redds were found in the lower 1.25 miles of Pinnacle Creek.

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.

Figure 1. Adult Bull Trout Index Reach Monitoring Clear Branch Creek.



Upper Clackamas River Bull Trout Reintroduction

(Clackamas River Ranger District)

The ESA listing of bull trout in late 1999 triggered formation of a Willamette River Recovery Team. The goal of the team was to set the framework for the recovery and protection of bull trout in the Willamette River Watershed. In November of 2002, the FWS released a draft bull trout recovery plan for the Willamette River. The Upper Clackamas River is identified as a reintroduction area in the draft Bull Trout Recovery Plan. Although no bull trout are now present, historically there was a population. The recovery team believes habitat elements are suitable for bull trout recovery.

A working group from the Clackamas River has been meeting informally over the past few years to look at options for bull trout reintroduction. With the release of the draft recovery plan, a Memorandum of Understanding was developed between the Forest and the Oregon Department of Fish and Wildlife to formalize roles and responsibilities for both agencies.

Based on the preference of bull trout for cool water, and relatively high quality habitat, the upper Clackamas River is a central area under consideration for bull trout reintroduction. In 2003, the working group will further evaluate options for reintroduction and develop a plan to begin reintroducing bull trout into the watershed.

NMFS Salmon Recovery Planning

(Headquarters)

Forest Biologist Dan Shively served the first half of the year as chair of the habitat group and as a member of the Technical Recovery Team for lower Columbia River and Willamette River ESA listed fish. A major accomplishment was organizing a well-attended and positively received workshop on the use of habitat as delisting criteria for salmon recovery planning.

Transferring salmon carcasses to the helicopter bucket for aerial transport.

Watershed Restoration Projects

Large-scale Salmon Carcass Enrichment & Monitoring

(Forest west-side)

FY02 was the big year for implementing the first large-scale pilot treatments for what has become a multi-watershed, long-term nutrient enrichment project. Surplus hatchery salmon carcasses are delivered to streams at maximum loading densities with a goal of increasing biological productivity and ultimately natural fish production.

Historically, tens of thousands of salmon returned to rivers and streams in the Pacific Northwest to spawn, leaving behind enormous quantities of nutrients, and for some organisms a direct food source. Since the late 19th century, these historic runs have diminished to a mere fraction. One consequence of the decline in number of carcasses is the loss of the large nutrient pump that helped drive the ecological productivity of stream systems.

In an effort to restart the pump and recover natural fish production in local tributaries in both the Clackamas and Sandy rivers, a large-scale restoration project was devised that would distribute 1,500 pounds of surplus hatchery salmon carcasses per mile of stream for the entire length of anadromous production for each treatment stream. With assistance from PNW Researcher Mark Wipfli, National Aquatic Monitoring Center Scientist Brett Roper, and Canadian Researcher Ken Ashley, Forest staff devised a comprehensive restoration project and accompanying monitoring and evaluation plan to evaluate the effectiveness of such treatments.

To accomplish such a large-scale project, we had to work closely with our partners and take to the sky with a helicopter to deliver large quantities of salmon carcasses to multiple streams, many with remote access. In FY02, a total of 22 stream miles were treated with 21 tons of salmon carcasses in the Clackamas River Basin and 16 stream miles treated with 16 tons of salmon carcasses in the Sandy River Basin. Ongoing treatments along with monitoring and evaluation efforts should provide keen insight into recovering natural fish production through these types of treatments.

Eightmile Culvert Replacements

(Barlow Ranger District)

Identification and replacement of fish barrier culverts is critical to increasing availability of habitat for fish. In 2002, an intensive effort was undertaken to replace a series of culverts all within a short distance of each other in the upper Eightmile Creek Watershed. Four culverts, within one mile of each other, were replaced to provide passage of juvenile and adult redband rainbow trout to access two miles of habitat upstream of the culverts. The habitat below the cluster of culverts has no passage barriers, and wild winter steelhead can now access the newly opened habitat areas. The cost of replacing each culvert was about $50,000.

Meadows Creek Culvert Replacement

(Hood River Ranger District)

Upgrading culverts to pass fish can occur as an opportunity. Road 3545 leads to the popular Mt. Hood Meadows winter sports area. The road failed at the Meadows Creek crossing, providing the opportunity to replace the culvert with a fish-friendly open-bottom arch culvert. There are four more barrier culverts downstream. All will be replaced as funding is available.

North Fork Eagle Creek Stream Restoration

(Clackamas River Ranger District)

The Cascades Resource Area of the Bureau of Land Management led a stream restoration project on the North Fork of Eagle Creek. The project is important because of the level of commitment and participation by partners. The project is on Longview Fiber land. Federal agencies (the FS and BLM) participated under Wyden Amendment Authority. The Clackamas River Basin Council received an Oregon Watershed Enhancement Board grant for $25,000 to contribute to the project. The Friends of Eagle Creek donated 10 trees (with rootwads) for the project. The BLM coordinated the project, and contributed $46,000 through the Jobs in the Woods program to pay for helicopter use. The Forest Service contributed two logging truckloads of trees.

Over one and one-half miles of stream were treated with large trees (greater than 22 inches diameter), with their rootwads attached. A Chinook helicopter flew individual trees and placed them in the stream and riparian areas. Complex log structures were built throughout the project area.

Burnt Lake Shoreline Restoration

(Zigzag Ranger District)

This project consisted of restoring shoreline areas degraded by recreational over-use at a popular camping and fishing site on the Zigzag Ranger District. Burnt Lake supports populations of rainbow trout, cutthroat trout, and brook trout, but its shorelines are being degraded by over-use.

In 2001, one acre of lake shoreline was restored, and campgrounds close to the lake's edge were closed, new trails away from the lake were brushed, and access to shoreline areas at-risk were restricted. In 2002, another acre of shoreline was restored along with additional trail and campground closures.

In the long term, the rehabilitated areas will reduce overall surface runoff into the lake, restore riparian function, and improve water quality.

An elevated foot trail was constructed at Burnt Lake to reduce impacts of human traffic at the environmentally sensitive shoreline.

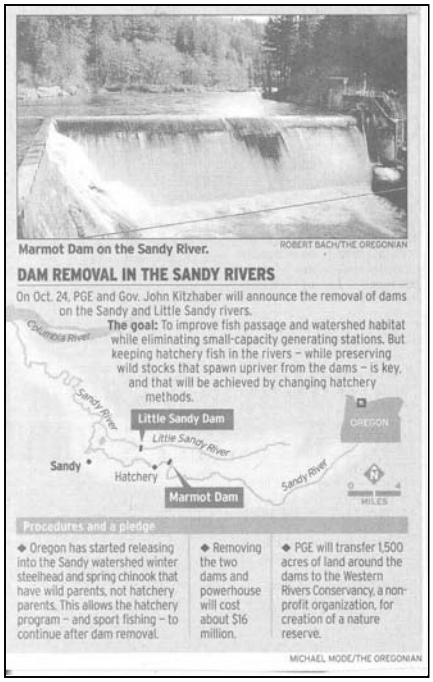
A helicopter dips water from the Clackamas River for a drop on the Bowl Fire. The smoke plume in the upper left hand corner marks the fire location.

Planning and Support

Sandy River Basin Agreement Team
Marmot and Little Sandy Dam Decommissioning
(Headquarters and Zigzag Ranger District)

The Sandy River Basin Agreement Team is a consortium of state, federal and local government organizations and private conservation groups interested in the long-term ecological health and management of the Sandy River Basin. In 2002, the team made progress on the Habitat Conservation Plan for the Portland Water Bureau's municipal water and hydroelectric operation in the Bull Run River Watershed. The team is assessing impacts of water diversions and down-ramping. The plan will tier off the Sandy River Basin Fish Restoration Plan developed during the previous two years.

In October, Portland General Electric (PGE) and all SRBAT partners signed off on a settlement agreement to decommission Marmot and Little Sandy dams. Several tricky issues were resolved including the contentious issue of mixing wild and hatchery fish stocks. PGE will transfer 1,500 acres of land around the dams to the Western Rivers Conservancy, a non-profit organization for creation of a nature reserve. The dams are scheduled for demolition by 2008.



This map displays the location of the two dams to be removed on the Sandy River and Little Sandy River. Graphic courtesy of the Oregonian.

The Bowl Fire
(Clackamas River Ranger District)

In September, a wildfire burned 339 acres in the Clackamas River canyon near Fish Creek. The fire was on the north-facing slope of the canyon in steep, rocky ground. Firefighting conditions were hazardous and suppression efforts relied on water drops from the nearby Clackamas River. The helicopter bucket water dips were in habitat of threatened chinook and steelhead, and triggered emergency consultation measures.

Anadromous Culvert Barrier Review

(Forest-wide)

In a joint effort with Engineering staff, Forest Fish Biologist Dan Shively and district fish biologists reviewed 14 culverts surveyed as impassable or potentially impassable to all life stages of anadromous salmon and steelhead. From this review, we were able to validate the original surveys completed between FY99-01 and begin prioritizing sites for reconstruction based on the importance of particular fish stocks present and the availability and quality of upstream habitat. Based upon these reviews, it became apparent that the original mapping of potential anadromous habitat was inconsistent, therefore several sites needed to be reexamined. Eight of the original 14 culverts identified as anadromous fish barriers have now been field-validated and prioritized at a Forest-level for design and reconstruction. However, seven other sites originally identified as blockages for resident fishes only await field review sometime in late spring of 2003.

Culvert barrier on a tributary to the West Fork Hood River (Forest Road 1810-0064).

Clackamas River fisheries biologists are investigating rates of natural production of brook trout in several creeks and streams in the watershed.

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 2002, 25 miles of stream were surveyed, inventorying fish habitat features such as pool depth and stream bank stability. The Forest crew also surveyed six miles for the Columbia River Gorge National Scenic Area.

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.

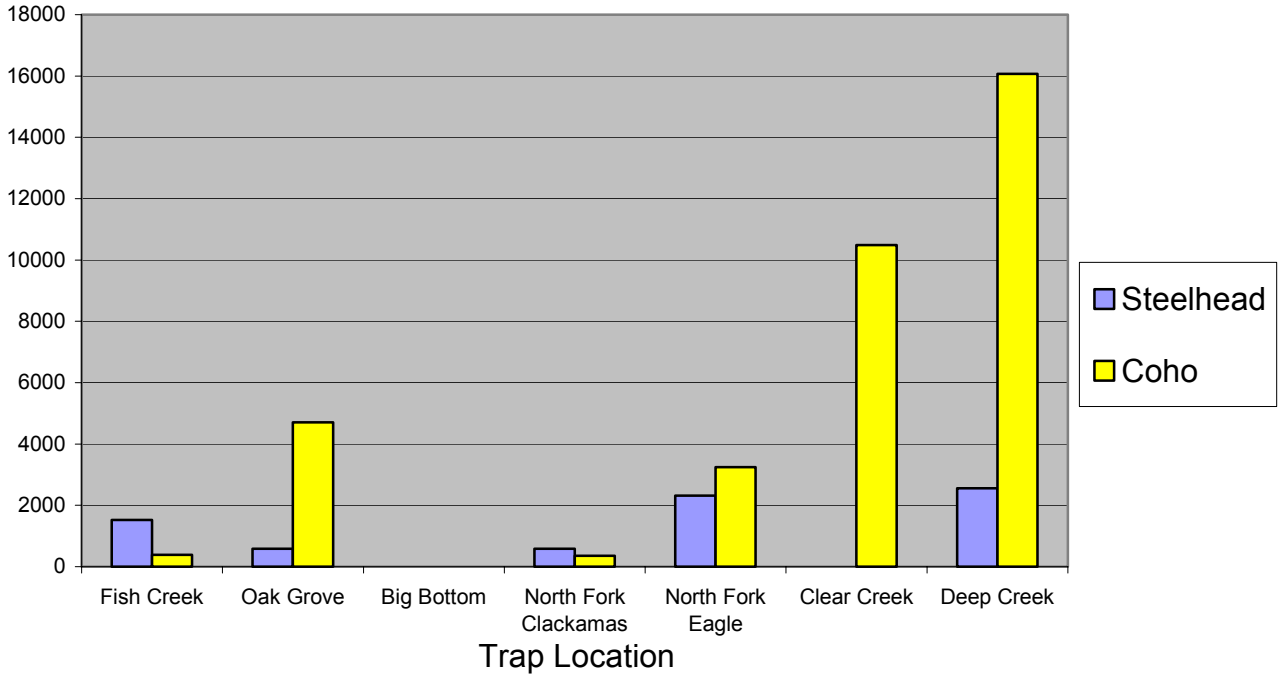
Clackamas River Fisheries Restoration

(Clackamas River Ranger District)

Since 1993, a consortium of fish biologists from federal, state and private organizations has partnered together to address fish management issues on the Clackamas River. In 2002, the Clackamas River Ranger District continued its role as a principal partner. Biologists led efforts to:

- Continue estimates of smolt output in seven major subwatersheds of the Clackamas River. Relatively large numbers of coho smolts were encountered in all subwatersheds, including Fish Creek, which has not had a significant coho emigration since 1999 (see Figure 2.) In addition, the major exodus of pacific lamprey macrophthalmia from Clear Creek witnessed in 2001 was absent in 2002. Smolt traps are located throughout the watershed, with three on the Forest, one on Bureau of Land Management property, and three on private lands. The trap at Big Bottom was out of service for much of the trapping season, therefore no population estimates are reported.

Figure 2. Clackamas River Smolt Traps Year 2002.



- During the spring smolt out-migration, a second study was undertaken to investigate the apparent mortality of a significant percentage of coho smolts originating in the Big Bottom reach of the upper Clackamas. Two hundred coho were given PIT tags at the Big Bottom smolt trap and, of those, only 52% were detected at the North Fork Dam juvenile bypass, 30 miles downstream. No evidence of size-dependent mortality was found.

- Fish passage studies conducted in 2000 on two baffled culverts were repeated in 2002 at higher flows and after minor culvert modifications were made in 2001. Passage was observed of several cutthroat larger than 78 mm in Tag Creek and larger than 107 mm in Tar Creek (which allowed no fish passage during the 2000 study).

- An investigation was also initiated in 2002 into a possible method of identifying reproductive components of brook trout populations in Clackamas Basin streams and lakes using fish scales. Scale samples were taken from fish known to be naturally produced and fish known to be originally stocked as well as from fish ready to be out-planted from the hatchery where stocked Clackamas brook trout originate. Samples await analysis. Brook trout sampling was done in Anvil Creek, Anvil Lake, Buck Lake, Upper Oak Grove Fork, Little Crater Creek and Memaloose Lake.

Bull Run Lake Cutthroat Trout Monitoring

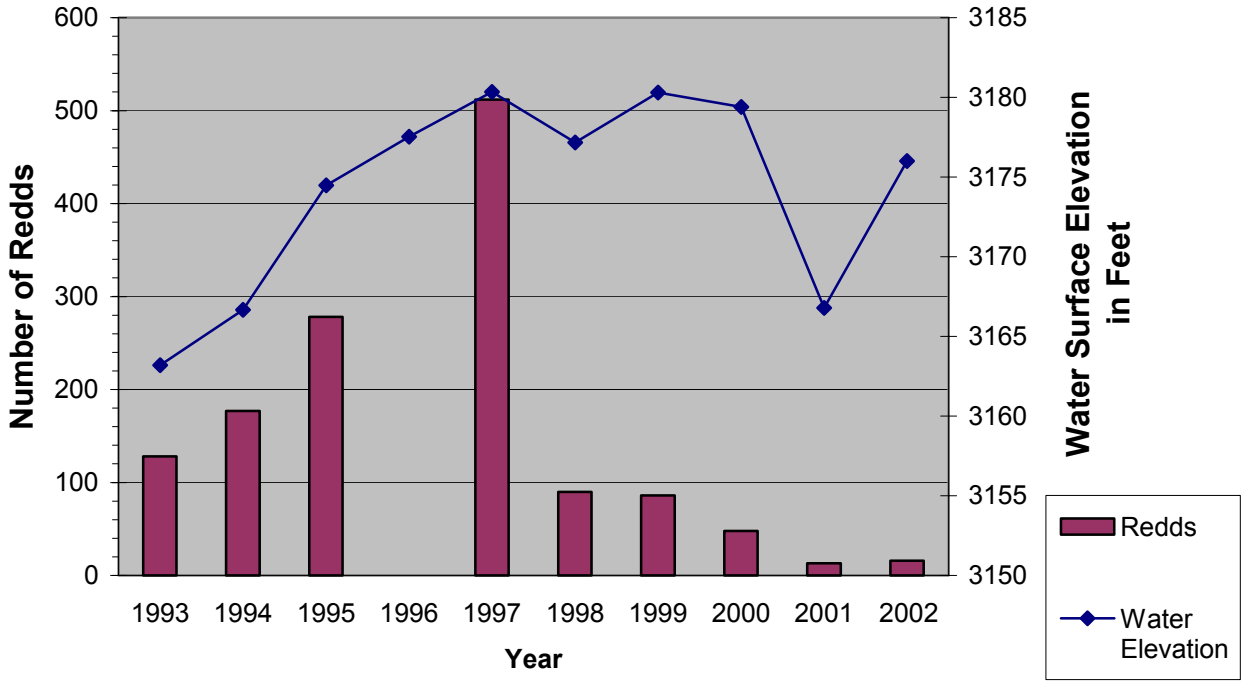
(Zigzag Ranger District)

In 2002, the Zigzag Ranger District continued annual monitoring of cutthroat trout spawning in the tributaries to 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 producing wild population of coastal cutthroat trout. Because cutthroat trout are the only fish species 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.

In 2002, redd counts remained low even though lake elevations were high enough for spawners to access the tributaries (see Figure 3). In 2003, biologists will continue to monitor the population and lake elevations to evaluate sustainability.

Figure 3. Bull Run Lake Cutthroat Trout Redd Monitoring.



Winter Steelhead Spawning Surveys

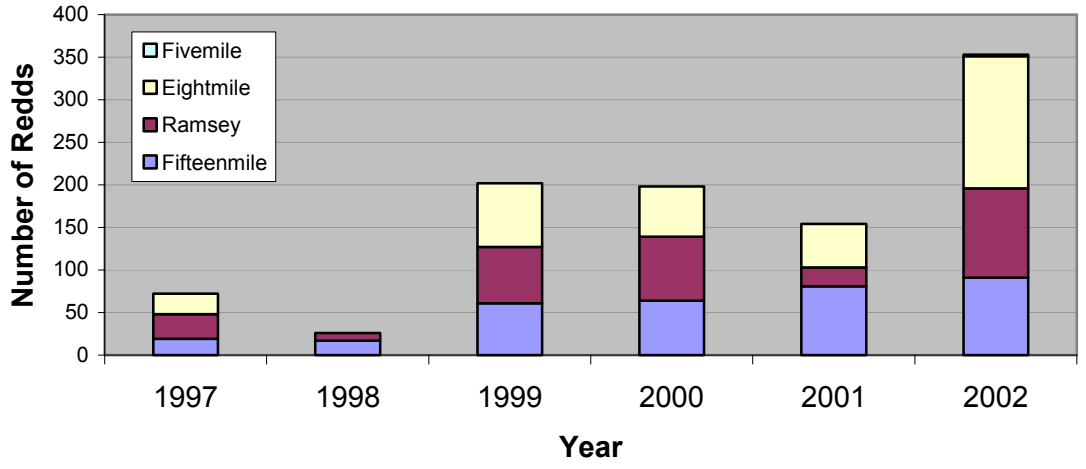
(Barlow and Hood River Ranger Districts)

In 2002, Forest personnel surveyed a total of 21.2 stream miles on the Barlow Ranger District. Repeat surveys were conducted on several Fifteenmile and Ramsey Creek reaches totaling 7.9 miles of survey effort. A total of 87 steelhead redds were found, primarily in Ramsey and Fifteenmile Creeks. Surveyors also noted 12 test digs, defined as an area where steelhead appeared to have dug in the substrate but, usually due to small size, the surveyors did not consider it to be a true redd where eggs were deposited. Seventy-one adult steelhead were seen and a total of 10 carcasses found. One lamprey redd was found.

Most redds and fish were seen in the lower reaches of Ramsey Creek and Fifteenmile Creek. No redds or adults were seen in Middle Fork Fivemile Creek, and only one redd was counted in the lower 1.8 miles of Eightmile Creek within the Mt. Hood National Forest.

Total redd counts in 2002 were high (Figure 4); 150 or more redds were counted compared to any of the previous three years. Reaches and total miles surveyed since 1999 by agency personnel have been similar, and most of the discrepancy in miles surveyed was due to Forest personnel not surveying upper reaches in the watershed where we normally do not find many, if any, redds. Therefore, we believe that comparing the last four years gives a reasonable index of steelhead adult run strength within the Fifteenmile watershed upstream from Dufur (excluding Fivemile Creek).

Figure 4. Six Year Summary of Steelhead Redd Counts in Fifteenmile Creek Watershed.



In addition, several streams in the Hood River system were surveyed. Eight-tenths of one mile was surveyed from Coe Branch to the Clear Branch Dam on Clear Branch, and five redds were found. Sections of McGee, Bear, Jones and West Fork Hood River were surveyed, but no redds were found.

Teachers in the Woods
(Forest west-side)

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 of teachers on the Forest. The Zigzag Ranger 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. Thirty-five teachers participated in the Teachers in the Woods program in 2002. Eleven teachers were assigned to the Forest, and 24 teachers were assigned to other forests in the region. Work crews of two to four teachers assisted in Forest Service personnel in monitoring 11 different types of projects on the Forest. Projects ranged from collecting seeds from sensitive plant species to monitoring stream restoration projects.

In 2002, the teachers spent 15 days totaling 1,590 hours implementing monitoring projects on the Forest. The value of the monitoring is estimated at $17,317.

Upper Sandy River Smolt Trapping
(Zigzag Ranger District)

In 2002, the Zigzag Ranger District continued monitoring of smolt production in the Upper Sandy River Basin at Still and Lost creeks. Smolt trapping provides increased accuracy for monitoring recovery of upper Sandy River Basin stocks of threatened steelhead trout and coho salmon. This data will also be incorporated into the Ecosystem Diagnostic Treatment (EDT Method) for modeling productivity in the Sandy Basin.

Environmental education is also a key component of the Zigzag smolt traps. Beginning in 2001, students from Portland-area high schools and colleges were given the opportunity to help staff the traps as a part of their school curriculum. Students volunteered at the trap 2-3 days per week for the three months that the traps were in operation. The traps provided a unique opportunity for the students to gain hands-on natural resource experience in a "real life" situation where their assistance played a important role in the success of the project.

Under the supervision of Zigzag Fisheries personnel, Portland area high school students remove fish from the Still Creek trap.

Residents in the Johnson Creek Watershed enjoy a sunny day and play the Salmon Life Cycle Game at the Springwater Festival.

Environmental Education

Fish biologists work actively with local communities to interpret and share information about the Forest and the fish resources. 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

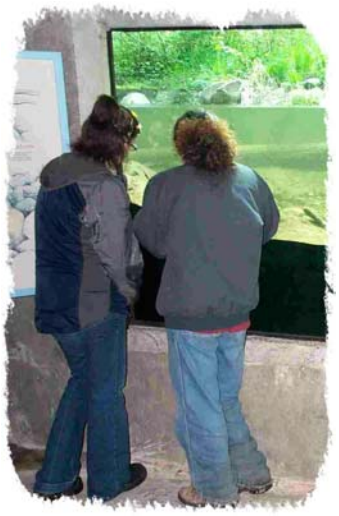
(Zigzag Ranger District)

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 Forest Service biologists in 1990 with partner Wolftree, Inc., 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 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, macro invertebrate 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 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 FY02, the program, which also serves the Gifford Pinchot and Deschutes national forests, reached 3,897 students in 112 classes from 102 different schools.



Students look for juvenile salmon at the fish viewing window on the Salmon River at Wildwood Park.

Fishing Clinics
(all Ranger Districts)

A successful angler displays her catch at the fishing clinic hosted by the Clackamas River Ranger District.

In celebration of National Fishing Week, four fishing clinics were hosted on the Forest in 2002. Over 850 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, a casting contest and fish identification. To learn about upcoming 2003 fishing clinics, go to: www.fs.fed.us/r6/nr/wildlife/nfw.

Oxbow Salmon Festival
(Zigzag Ranger District)

Excited children dressed in "web-of-life" costumes wait for the storyteller to begin in the salmon tent.

The Forest is a major sponsor of the Oxbow Salmon Festival; a 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. Approximately 8,800 attended the festival in 2002, highlighted by beautiful blue skies and high visibility of spawning chinook. Three hundred attendees were surveyed regarding popularity of exhibits, and the Forest Service sponsored children's activity tent rated second overall, following the festival musical entertainment.

Springwater Festival
(Zigzag Ranger District)

Johnson Creek is a highly urbanized stream flowing through many cities in the Portland area before joining the Willamette River. The Johnson Creek Watershed Council hosted a celebration at Gresham City Park to raise awareness of Johnson Creek and provide information to local residents about their watershed. The Forest participated in the one-day event and provided the inflatable salmon story telling tent, an educational display and hosted the Salmon Life Cycle Game. Over 600 people attended the first time event.

Salmon Watch

(Forest west-side)

In 2002, 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 2002, a total of 1,170 students from 28 middle and high schools were reached in the Portland-metro area.

Salmon Life Cycle Game

(Forest Headquarters)

Ten years ago a game was developed on the Forest based on the life cycle of Pacific salmon. In 2001, the Forest received a grant to upgrade and redesign the game. Ten copies of the game were produced and used in classrooms and at outdoor environmental education events. As the game became more widely used, and requests to borrow the game began to increase, Forest personnel explored the possibilities of developing a board game at a reasonable cost. Partners involved in environmental education were contacted to explore their interest. The Forest decided to proceed, and in 2002 several grants, totaling about $35,000, were submitted to organizations with an interest in environmental education. The goal is to produce 500 "Monopoly" style board games in 2003 to distribute to public schools in the Portland, Oregon and Vancouver, Washington area, and for contributing partners to have games for their environmental education programs.

Frank Fish encourages Directors as they play the Salmon Life Cycle Game at their Regional Office Monday morning meeting.

Zigzag Ranger District biologists Duane Bishop and Heidi Vogel take a break while training Teachers in the Woods participants on the Clear Fork of the Sandy River.

Staffing and Funding

Headquarters

Dan Shively, *Forest Fish Biologist (503) 668-1605*
Tracii Hickman, *Fish Biologist (located at Sweet Home Ranger Station) (541) 367-9203*

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*
Paul Powers, *Detail - Assistant District Fish Biologist – Hood River*
Summer Crew – Kathryn Arendt, Carey Nelsen, Tony DePinto,
Annie Bourinskie, Kevin Mitchell; Amanda McKinney

Zigzag Ranger District

Duane Bishop, *District Fish Biologist (503) 622-3191*
David Saiget, *Assistant District Fish Biologist*
Darcy Morgan, *Fish Biologist*
Summer Crew – Heidi Vogel (Teachers in the Woods Coordinator), Dean Thomas,
Ron Guiles, Loren Meagher

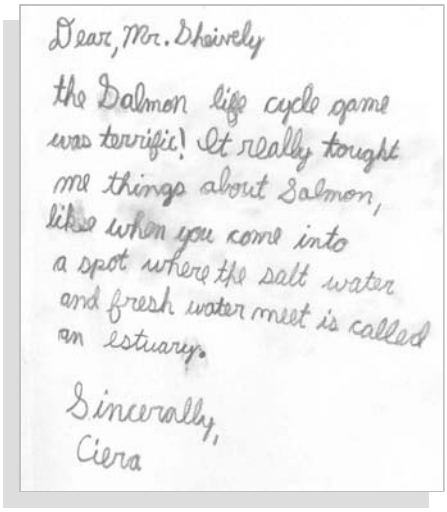
Clackamas River Ranger District

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 – Mark Schoenborn, Robin Miranda

Stream Survey Program

Katie Serres, *Program Coordinator (503) 630-8784*
Stream Survey Crew – Rose Christensen, Brad Johnson, Jeff Woltering (AFS Hutton student)

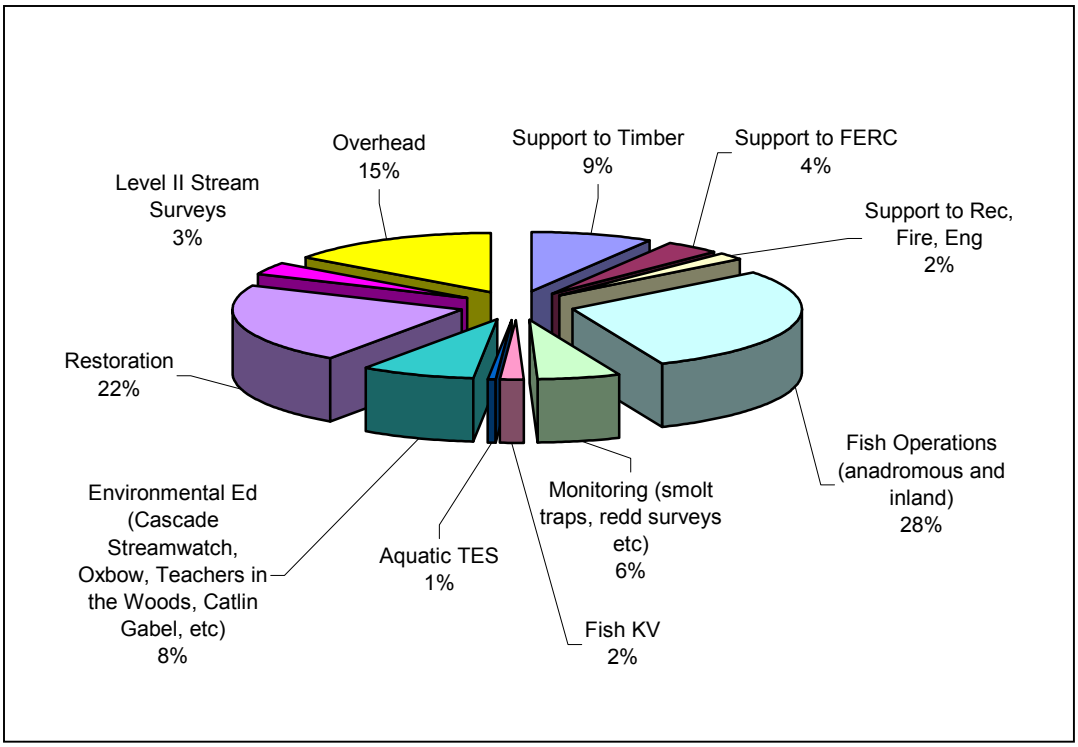
Congratulations to Forest Fish Biologist Dan Shively, recipient of the national award *"Rise to the Future - Excellence in Program Management"*.



Samples of cards sent to Dan Shively expressing their appreciation for the Salmon Life Cycle Game from fourth graders in Len Otto's class at Sweetbriar Elementary School, Fairview, Oregon.

The total budget for the fisheries program on the Forest in 2002 was $1,503,165. Figure 5 displays the various allocations for program areas.

Figure 5. Fisheries Budget Year 2002.



Four fishing clinics are held annually on the Forest, including one at beautiful Trillium Lake.

Thank You to our Many Partners!

- Alpha School
- American Fisheries Society, Hutton Scholarship Program
- Arrah Wanna Home Owners Association
- Association of Northwest Steelheaders

- Boy Scouts of America, Columbia Pacific Council – Camp Baldwin
- Bureau of Land Management

- City of Dufur
- Clackamas County Water Environment Services
- Clackamas River Basin Watershed Council
- Clackamas River Water Providers
- Cleveland High School
- Confederated Tribes of Warm Springs

- Deschutes Resources Conservancy

- Eagle Creek National Fish Hatchery
- Estacada High School

- Farmers Irrigation District
- Fifteenmile Watershed Council

- Hood River County Soil and Water Conservation District
- Hood River Watershed Council

- Inner City Youth Institute

- Lost Boulder Irrigators

- McBain and Trush, Inc.
- Metro
- Middle Fork Irrigation District
- Mt. Hood Community College

- National Marine Fisheries Service
- Natural Resources Conservation Service
- Native Fish Society

- Oregon Department of Environmental Quality
- Oregon Department of Fish and Wildlife
- Oregon Department of Forestry
- Oregon Trout

- Portland General Electric
- Portland State University
- Portland Water Bureau

- Resort at the Mountain

- Salmon Corps
- Sandy River Basin Watershed Council
- Sandy River Hatchery (ODFW)

- The Dalles Water Bureau
- Trout Unlimited – Tualatin Valley and Clackamas River Chapters
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- U.S. Fish and Wildlife Service

- Wasco County Soil and Water Conservation District
- White River Watershed Council
- Wilderness Volunteers
- Wolftree, Inc.