United States
Department
of Agriculture

Forest
Service

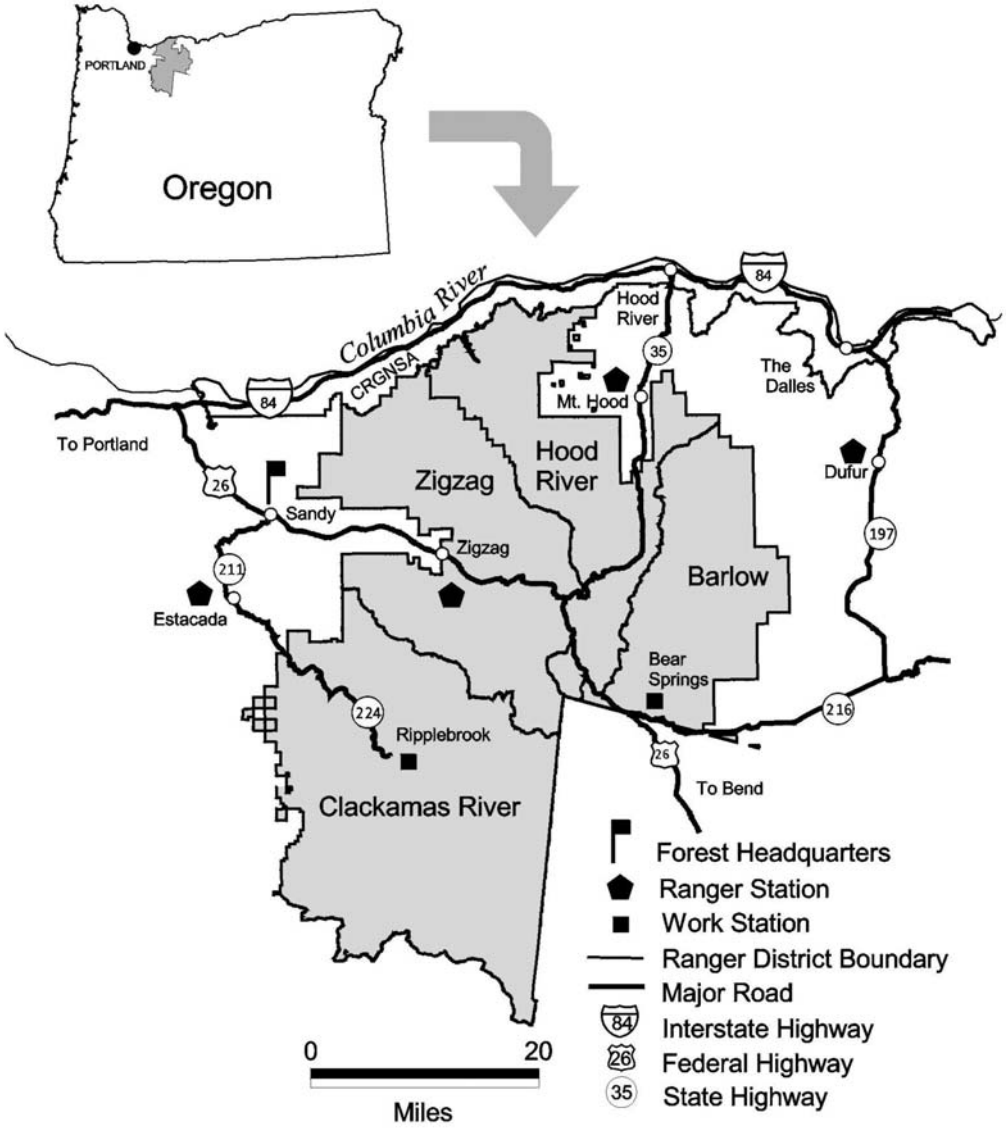
**Pacific
Northwest
Region**

2004

Fisheries Program Accomplishment Report

Mt. Hood National Forest 2003

Mt. Hood National Forest Vicinity Map



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On the cover: In 2003 a survey of lakes was completed on the Mt. Hood National Forest. Here Robin Miranda holds a rainbow trout caught during a creel census at Shining Lake.

Employees of the Mt. Hood National Forest took all photos in this report.

Welcome to the 2003 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 2003 on the Mt. Hood National Forest (the Forest).

This year we are featuring two restoration project summary reports. The first report describes a large-scale nutrient enrichment program using salmon carcasses on the west side of the Forest. The second describes the restoration of a newly acquired parcel of land with a valuable steelhead stream on the eastside of the Forest. If you are interested in a more detailed report of these two projects contact the biologists listed in the report.

Program area accomplishments follow the summary reports, then a summary of the budget in 2003, a listing of fisheries personnel, and finally, our many partners who are critical to accomplish work and manage the fisheries resource on the Forest.

If you are interested in additional information about a program or activity described in this document, please contact the appropriate individual listed at the end of the document, or the office listed inside the front cover.

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Effectiveness of Salmon Carcasses to Restore Stream Nutrients

Burke Strobel
Clackamas River Ranger District

Goals

- Re-introduce Essential Marine Derived Nutrients to Cascade Streams,
- Increase Aquatic Invertebrate Populations, and Thereby
- Increase Density of Juvenile Salmon Populations, and
- Monitor for Effectiveness

Photo above: A site on the Clackamas River following a helicopter drop of carcasses.

Methods

Surplus hatchery salmon carcasses (hatchery fish no longer needed to supply eggs, or are not edible) are delivered to streams at maximum loading densities with a goal of increasing biological productivity and ultimately natural fish production.

Carcasses are delivered to streams via helicopter or through volunteer labor. In 2003, salmon runs returning to Clackamas River hatcheries were drastically reduced, necessitating a scaling back of carcass enrichment efforts. Thirty tons of salmon carcasses were spread over 44 miles by helicopter, in 2003, with an additional three miles being treated by hand with nearly four tons of carcasses.

Photo above, left: Most salmon carcasses are delivered by helicopter. Frozen carcasses are loaded into a modified gravel bucket, and then dropped into streams. *Photo above, right:* Some carcasses are delivered manually, as shown here by volunteers from of the Inner City Youth Institute.

Monitoring

Evaluation of the carcass enrichment project has been largely based on a comparison between streams treated with 2,500 pounds of carcasses per mile and control streams left untreated. The following ecosystem responses are being monitored:

Water Chemistry

- Soluble Reactive Phosphorous
- Total Dissolved Phosphorous
- Total Phosphorous
- Nitrates and Nitrites
- Ammonia

Biofilm

- Biomass (ash-free dry weight)

Macroinvertebrate Drift

- Biomass
- Species Composition

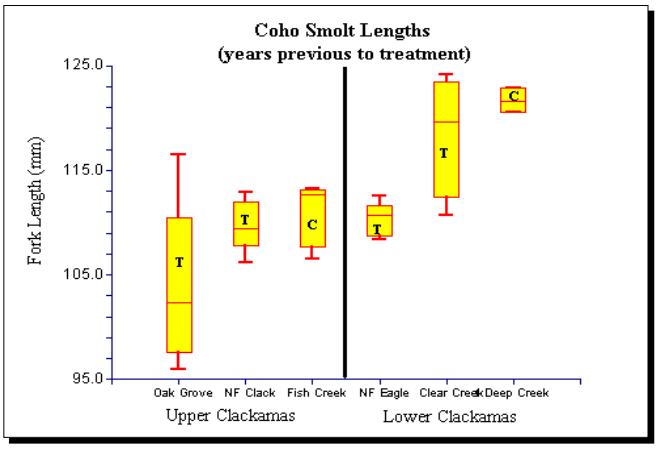
Fish

- Smolt production
- Fish growth

Photo above: Macroinvertebrate drift samples are collected to determine changes in biomass and species composition.

Results

Initial results have been inconclusive. Application rates (kilograms of carcasses per square meter of stream) may be too low. Carcass weights in river systems reported in scientific literature range from 0.64-16.11 kg/m^2, where streams treated in this project ranged from 0.03-0.09 kg/m^2. In addition, definitive answers are confounded by within- and between-site variability. Project managers are evaluating the project to increase the application rate of carcasses in future treatments.



At left: This figure illustrates pre-treatment and post-treatment mean coho smolt fork length. "T" indicates treatment stream, "C" indicates control stream.

Ramsey Creek Restoration

Chris Rossel
Barlow Ranger District

Goals

- Reintroduce large wood to the stream channel and floodplain,
- Minimize erosion from identified sediment sources, and
- Increase the overall quality of steelhead spawning and rearing habitat.

Current and Historic Condition

The Ramsey Creek project area was owned and managed by the Mt. Fir Timber Company until 1992. The company's primary emphasis was timber production. The Rocky Mountain Elk Foundation purchased 2,778 acres from Mt. Fir Timber Company with the management responsibilities delegated to Oregon Department of Fish and Wildlife. In 1997, the U.S. Forest Service acquired the parcel from the Rocky Mountain Elk Foundation.

Since the mid-1860s, the Ramsey Creek Watershed has experienced farming, livestock grazing, and extensive selective and industrial timber harvesting (including the riparian areas). In the winter of 1997, a rain-on-snow event produced an estimated 15-to-20 year flood. This contributed to severely degrading steelhead spawning and rearing habitat by causing channel down cutting, loss of connectivity of the stream channel to the floodplain, increased fine sediment, and loss of stream channel vegetation. The previous timber harvesting and lack of roughness exacerbated the large amount of degradation. A restoration plan was developed to address these problems. Project funding came through the Hatfield supplemental flood funding in 1997.

Strategic Watershed Restoration Planning

Three separate documents provided the strategic framework from which to plan, design, implement, and monitor restoration activities to achieve desired conditions in the Ramsey Creek Watershed. These include the Mile Creeks Watershed Analysis (1995), Ramsey/Fifteenmile Creeks Restoration EA (1998), and the Ramsey Creek Fisheries Monitoring Plan (1998).

Restoration activities were designed to achieve specific goals and objectives. Linkages among the restoration goals, restoration objectives, restoration activities, and monitoring are outlined in Table 1.

Table 1. Linkages among the goals and objectives, restoration activities, and monitoring.

Restoration Goals	Restoration Objectives	Restoration Activities	Monitoring Activities
Increase amount of large wood	Meet or exceed Forest Plan standard of 106 pieces per mile	Placement of about 1,400 logs in both the stream channel and floodplain	Level II instream inventory survey (1997 and 2004) Photo monitoring
Decrease road related sediment	Convert 2.9 valley bottom road miles to a non-motorized trail	Close road, obliterate, and out-slope ¾ of the roadway width	Visual monitoring of active erosion on the trail system
Plant conifer and hardwood trees	Decrease percentage of eroding banks to below 5%	Plant about 25 acres of both conifer and shrubs both along the trail and small meadows	Visual monitoring of plant success
Improve aquatic habitat	Increase number of pools per mile 40% in the first mile and 30% in the upper two miles	Excavate out primary pools from existing pools and place large wood in the stream channel	Level II instream inventory survey (1997 and 2004) Photo monitoring

1998 (Before) **2002 (After)**

Lessons Learned

- Develop a multi-year funding strategy.
  - The larger the project, the more time is needed to plan, implement, and monitor achievements.
  - The more partners you have the longer it takes to plan the project.

- Take the time up front to develop a well thought out project monitoring plan.
  - Make sure that you have measurable goals and objectives.
  - Develop both a short and long-term monitoring plan based on different budget scenarios.

Rocky Mountain Elk Foundation, Ruffed Grouse Society, and Oregon Department of Fish and Wildlife were key partners.

Partners and Restoration

Trout Unlimited in the Clackamas River Basin

The fisheries biologists at the Clackamas River Ranger District, in partnership with the Clackamas River and Tualatin Valley Chapters of Trout Unlimited, successfully competed for a $6,400 Trout Unlimited National Grant through the "Embrace a Stream" program. The funds were used to complete the first three partners and restoration projects presented.

Round Lake

Round Lake is a high elevation lake near the headwaters of the Collawash River, a tributary to the Clackamas River. The lake is a popular fishing spot, locally famous for a population of large brook and brown trout. Stream surveys showed a lack of spawning gravel at the Round Creek inlet to Round Lake. The stream channel was also lacking needed hiding cover for spawning adults.

Volunteers from Trout Unlimited spent a weekend moving five yards of gravel into Round Creek. Using small mechanical crawlers they pulled several small trees from a log truck up the trail to stream, and used peaveys to wedge them into place. The improved channel conditions will benefit the entire lake with improved natural production of trout.

Above: A TU volunteer adds spawning gravel to Round Creek.

Upper Clackamas Side Channel Maintenance

In 1998, a historic side channel was reconnected with the mainstem Clackamas River. Monitoring has shown use by juvenile coho, chinook and steelhead. Although trees are beginning to re-establish along the banks of the side channel, it was lacking large wood in the channel and overhead hiding cover.

Twenty volunteers from Trout Unlimited worked with a spyder backhoe and self-loading log truck to place a log truck load of red alder logs into the channel. In addition, large boulders were placed to add complexity to the channel.

At left: After a hard days work, TU volunteers relax and pose for the camera.

Fish Creek Tree Planting

Following a major flood in 1996, many of the roads in the Fish Creek Watershed were obliterated to improve watershed health. In 2003, Trout Unlimited volunteers planted 1,000 Douglas fir and western red cedar trees along four miles of an old roadbed that used to border Fish Creek.

Slopes next to tributaries entering Fish Creek were targeted for planting. Tree planting will accelerate establishment of a mature riparian forest, which will in turn provide needed shade and stream bank stability along Fish Creek.

At left: In April, volunteers from Trout Unlimited planted conifers along a decommissioned roadbed in the Fish Creek Watershed.

Arrah Wanna

Several years ago, 20 members of the homeowners association "Arrah Wanna" recognized their homes were built on the historic maintstem of the Salmon River, a tributary to the Sandy River. They also recognized there were opportunities for fish habitat restoration. In 1998, a six-partner coalition came together to seek funding and develop a restoration plan and the Arrah Wanna Salmon River Restoration Project was underway.

Since then, funds for the project have come from federal agencies (using the Wyden Amendment authority), private foundations and the homeowners themselves. The purpose of the project is:

- To restore spawning and rearing habitat for threatened and endangered salmonids that historically used the side channel. This includes increasing water quantity and restoring water quality to historic conditions.
- To convert an artificially maintained pond into a natural wetland.
- To decrease water temperatures in the side channel flowing through the project area.
- To decrease the potential for adverse impact to surrounding privately owned land and structures as a result of project implementation.

Accomplishments in 2003 for the multi-year project included construction of 13 structures in the lower 2/3 of a rebuilt side channel using 60 logs, 25 rootwads and 65 boulders; planting 1,900 willow cuttings, and pulling two acres of noxious weeds. In addition, a walking spyder backhoe performed maintenance on the side channel to increase the amount of flow entering the side channel.

Above: The reconstructed side channel before (left) and after (right) restoration. Side channels provide critical habitat for overwintering juvenile salmon such as coho. This type of salmon habitat is often lost as wetlands and seasonal channels are dammed and filled.

Wilderness Volunteers, a nonprofit organization created in 1997 to organize and promote volunteer service to America's wild lands, continued assistance at the Arrah Wanna project. Volunteers helped with noxious weed control and planted riparian species such as willow.

At left: Plantings along waterways accelerate bank stabilization and will provide needed shade.

Payments to Counties and Whole Watershed Restoration

During the past decade, two federal laws and one Oregon state law have provided a legal framework for whole watershed restoration involvement and funding by federal agencies. Public Law 106-393 "Secure Rural School and Community Self-Determination Act of 2000" *(commonly known as Payments to Counties or PayCo),* supplies funds to counties with sharply curtailed revenues from federal timber harvest; the Wyden Amendment (Title III, Section 323, P.L. 105-277) provides federal agencies the authority to enter into cooperative agreements with partners to restore, protect or enhance ecosystems anywhere within the ecosystem as long as the project will also benefit federal lands; and in 1995 the Oregon Legislature authorized formation of watershed councils by local county governments to "sustain natural resource and watershed protection and enhancement within a watershed" (House Bill 3441).

Photo above: Salmon habitat restoration on private lands can be funded through Payco. Here a walking spyder backhoe reconstructs an old beaver pond.

In partnership with local watershed councils and irrigation districts, in 2003 and 2004 PayCo has funded:

- $261,393 for fish habitat and riparian improvement projects,
- $143,505 to replace eight problem culverts, and
- $675,895 to complete nine ditch piping and irrigation screening projects.

Ramsey Creek Dedication and Partnership

Protecting wildlife and aquatic habitat is the goal of many conservation groups. A team of organizations — Rocky Mountain Elk Foundation (RMEF), Mt. Hood National Forest, Ruffed Grouse Society and Oregon Department of Fish and Wildlife — recently united to complete a 9,381-acre project designed to bring significant benefits for elk, steelhead and other species.

The project, in and near Ramsey Creek near Dufur, was the culmination of a ten-year process by RMEF to acquire nearly 10,000 of timberland owned by Mountain Fir, and then turn ownership over to state and federal agencies.

A dedication ceremony was held on a cool and breezy May morning to mark the conclusion of the purchase, transfer and restoration of the old Mountain Fir parcel. Thirty-five members of the Elk Foundation, Forest Service, Ruffed Grouse Society and Oregon Department of Fish and Wildlife gathered at Ramsey Creek for either a guided naturalist hike through the lower watershed, or to help with winter steelhead spawning surveys and pulling invasive noxious weeds. Afterwards all gathered together at Dufur City Park for an awards ceremony and BBQ hosted by RMEF.

At the ceremony, each partnering organization recognized all who worked to protect and enhance the valuable habitat at Ramsey Creek.

Above: Participants at the Ramsey Creek dedication before a naturalist hike through the acquired land parcel. An interpretive sign placed at the former road marks the trailhead.

Partners and Conservation Education

Salmon Watch

The Forest has been a long-standing partner with Oregon Trout and their renowned Salmon Watch program. In place nearly 10 years, Salmon Watch has been an effective conservation education program serving middle and high school students in Oregon. Students witness spawning salmon, one of nature's great spectacles, coupled with classroom instruction and service learning projects. The program is designed to instill a deeper appreciation and understanding of the value of native fish, watershed conservation and environmental stewardship.

At right: Clackamas River Fish Biologist Bob Bergamini (in the cap) assisted in several Salmon Watch field trips in 2003. Here he explains the life cycle of salmon as students watch spawning adults. The cool sunglasses worn by the students have polarized lenses, and allow viewers to see better through the water.

Cascade Streamwatch

Cascade Streamwatch (CSW) is a regionally and nationally recognized, premiere facility and program offering outdoor conservation education that focuses on aquatic ecology. A few key messages of the program are listed below.

- CSW offers an outdoor educational facility and program that allow students, largely from urban communities, to experience and learn about the natural resources on Federal lands.
- CSW increases the collective knowledge of future voting generations, enabling society to make informed decisions about living in a more sustainable manner.

In 2003, Cascade Streamwatch served 3,800 students and made over 300 presentations.

Oxbow Salmon Festival

The Oxbow Salmon Festival is in its 20th year of celebrating the annual return of the salmon to the Sandy River.

Begun in 1984, the Salmon Festival brings together a wide range of partners, agencies, and non-profit organizations that provide dozens of informative booths and displays teaching about the importance of protecting wild salmon and healthy watersheds.

Above: Francis Fish participates in the web of life parade. In the background is the Salmon Tent.

Unique Attractions of the Oxbow Salmon Festival

- Guided walks hosted by fish biologists to view spawning salmon.
- School of Fish – held at the river's edge to learn the life cycle of Pacific Salmon.
- Children's Salmon Tent (hosted by the Forest).

Fishing Clinics

In celebration of National Fishing Week, four fishing clinics were hosted on the Forest in 2003. Attendance included at least 437 children (the number who registered) and as many adults. An amazing 124 partners, including fishing groups, national and local businesses, service organizations and individuals participated 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. And of course, catching fish!

Above: Successful anglers show off their catch at the Clackamas River Ranger District fishing clinic.

Teachers in the Woods

In the summer of 2003, the Mt. Hood National Forest successfully implemented the seventh year of a unique Challenge Cost Share program known as "Teachers in the Woods." This program is part of a multi-forest partnership with Portland-Metro area middle and high school science and biology teachers, Portland State University's Center for Science Education, Wolftree, Inc., the Gifford Pinchot National Forest, the Rogue/Siskiyou National Forest, and the Columbia River Gorge National Scenic Area.

The program gives teachers meaningful learning experiences while accomplishing valuable monitoring work on national forests. It also provides them with a foundation for teaching young people about natural resource management on federal lands and assists them in developing new curricula for their classrooms.

Above: Carolee Cummings, Five Oaks Middle School, evaluates the shading from the overhead tree canopy in the Oak Grove Fork of the Clackamas River, while Katie Frischmann, Gregory Heights Middle School, measures water velocity.

Thirty-seven teachers participated in the "Teachers in the Woods" Program in 2003. Fourteen teachers were assigned to the Forest. Teams of teachers assisted Forest Service personnel in completing 15 different monitoring projects on the Forest ranging from surveying for rare butterfly species to evaluating the substrate in forest streams. The teachers conducted 2,100 hours of fieldwork over four weeks, valued at approximately $27,825 in salary savings for the Forest Service.

Inner-City Youth Institute

The Inner-City Youth Institute is a program sponsored by the Oregon State University (OSU) College of Forestry. The goal is for OSU staff to provide educational programs and natural resource club support to inner-city high school students attending selected Portland Public Schools high schools. The program provides educational programs and club support during the academic year, and a summer camp each July in Corvallis.

In 2003, participants in the Inner-City Youth Institute assisted with several projects on the Forest. Students assisted with salmon carcass distribution on Clear Creek as part of the Salmon Carcass Nutrient Restoration Project. They also assisted at Arrah Wanna stream restoration project planting 400 cuttings of willow.

Fisheries Monitoring

Fifteenmile Creek Watersheds Spawning Surveys

In 2003, an important step was taken in the collaborative management of fisheries when the Forest joined forces with the Oregon Department of Fish and Wildlife (ODFW) to conduct winter steelhead spawning surveys in the entire Fifteenmile Creek Basin. Although both agencies collaborated in the past and were partners in the survey effort, there was never a coordinated survey designed to assess the entire basin.

In 2003, ODFW published a survey method with a spawning protocol for use statewide. Fisheries biologists from both agencies selected survey reaches from the 100 miles of potential steelhead spawning habitat in the Fifteenmile Creek Basin. The protocol is described in an accomplishment report available at the Barlow Ranger District.

In addition, five index reaches repeatedly surveyed in the past were included. The index reaches contain high quality habitat and provide a link to earlier data.

In 2003, Forest personnel surveyed a total of 25 reach segments. All, with a few exceptions, were surveyed three times during peak steelhead spawning in April and May. Of the twenty-five, 11 were on lower elevation, private lands.

Results and Discussion

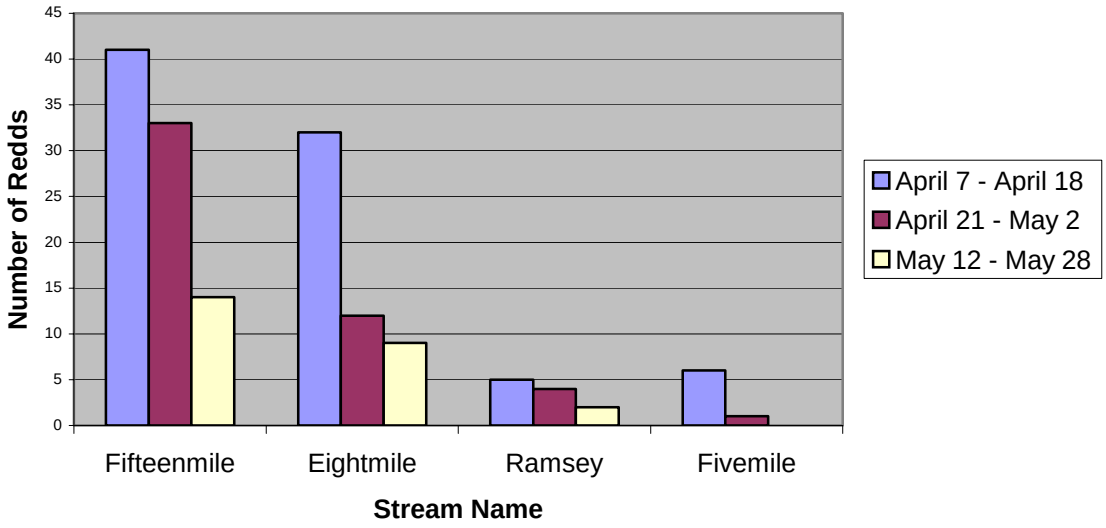
A total of 159 steelhead redds were counted throughout the Fifteenmile Creek Basin. Over half of the redds were in Fifteenmile Creek. The highest density of redds was also in Fifteenile Creek at 7.7 redds per mile. The estimated total number of steelhead redds throughout the basin was 525.

One third of redds were found on private lands, indicating a relatively large portion of steelhead are spawning in the lower portion of the basin. Egg to smolt survival may be reduced for these steelhead, compared to the upper basin, because of widespread habitat degradation, particularly elevated water temperatures in the summer.

This is the first year repeat surveys were conducted throughout the entire basin. Compared to previous years' surveys, multiple surveys provide a more accurate count of the total number of redds (see Figure 1.) throughout the spawning season.

Since ODFW's protocol was adopted in 2003, comparisons to previous years are not possible. It is worth noting that in past years more redds were found in Fifteenmile and Eightmile creeks compared to the other two tributaries. There were only six redds found in Ramsey Creek compared to 28 in 2002. Biologists are uncertain why there was such a large drop in 2003.

Figure 1. Number of Steelhead Redds by Stream by Survey Date



Pacific Lamprey are native to the Fifteenmile Creek Basin. Information on their status was collected anecdotally while collecting steelhead spawning information. Forty-one lamprey redds were counted in Fifteenmile Creek, and 10 redds in Eightmile Creek. No lamprey redds were counted in Ramsey or Fivemile creeks. Most redds were counted during the third and final survey. Lamprey spawning appears to occur after the peak of steelhead spawning. There were a number of cases where lamprey built redds on top of existing steelhead redds.

Bull Trout Population Monitoring

Bull Trout Spawning Surveys

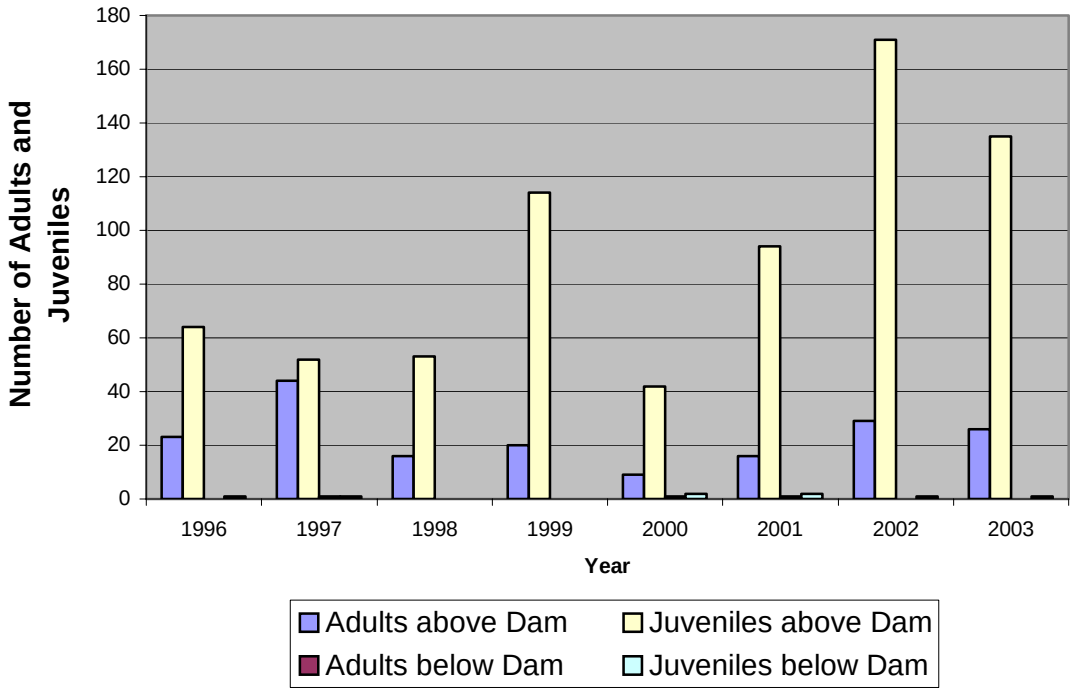
Redd surveys are repeated annually in low gradient, non-glacial streams to establish spawning index rates. In 2003, 15 bull trout redds were found in Clear Branch, all above Laurance Lake. Four bull trout redds were found in the lower 1.25 miles of Pinnacle Creek.

Bull Trout Adult and Juvenile Counts

Snorkeling is the primary survey method to monitor population trends. Snorkeling at night is the most successful for conducting consistent juvenile census. 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 2. Since 1996, only three adults and eight juveniles have been found below the Laurance Lake Dam.

Figure 2. Summary of Annual Bull Trout High Counts
Clear Branch Hood River 1996 - 2003



In 2003, 26 adults and 135 juveniles were found in streams above Laurance Lake. Approximately 25 percent of available habitat was surveyed. Bull trout populations on the Forest above Laurance Lake Dam continue to be at very low levels.

Clackamas River Smolt Production Monitoring

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 2003, 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 seven rotary smolt traps at locations throughout the Clackamas River Basin. Four are on-Forest and three are operated off-Forest. All fish caught are enumerated, and population estimates are made for coho salmon and steelhead. Figures 3 and 4 display the results of trapping from 1994 through 2003.

In 1998 and 2000, traps were added at locations below the network of dams near Estacada. As indicated in Figures 3 and 4, most major tributaries of the Clackamas River are monitored for smolt production. Big Bottom, on the upper Clackamas River, continues to be an important location for coho rearing and production. Distribution of steelhead production appears to be more widespread throughout the basin. Coho are listed as a State of Oregon endangered species, and their overall numbers are lower, and in some instances extremely low in some tributaries.

Figure 3. Estimated Steelhead Smolt Production from Watersheds of the Clackamas River 1994-2003.

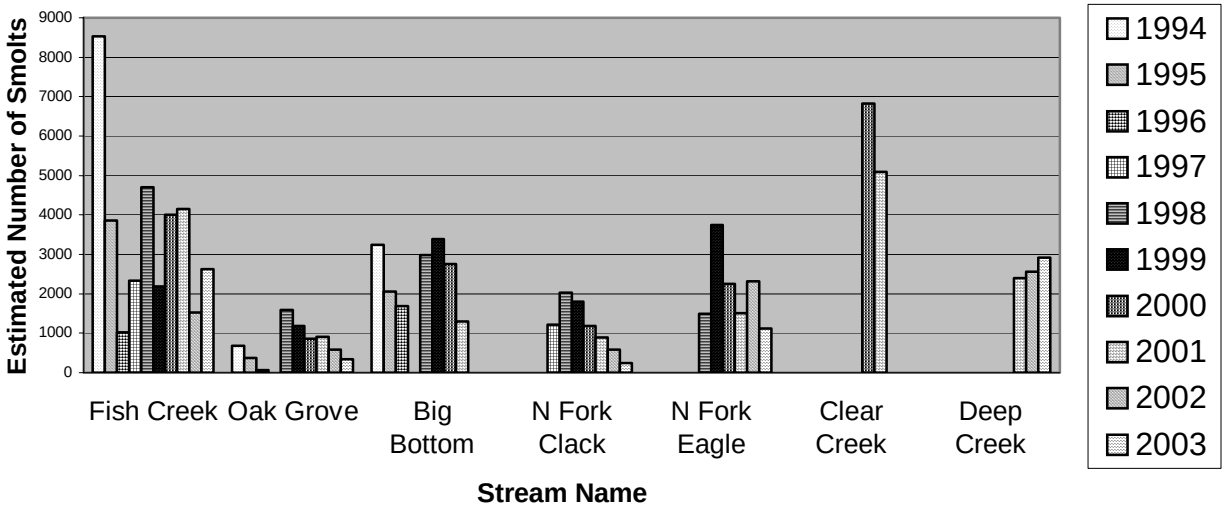
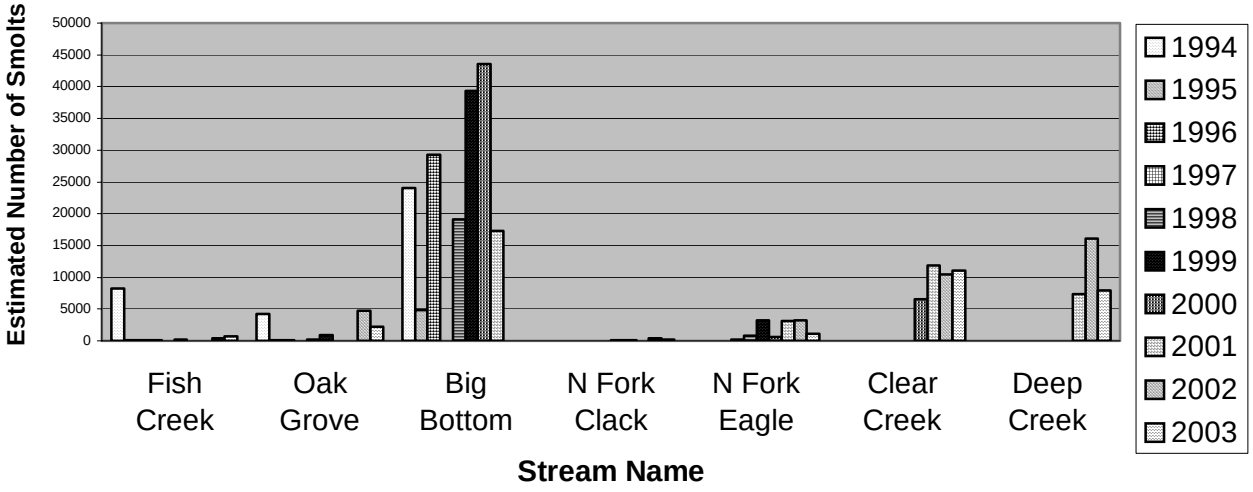


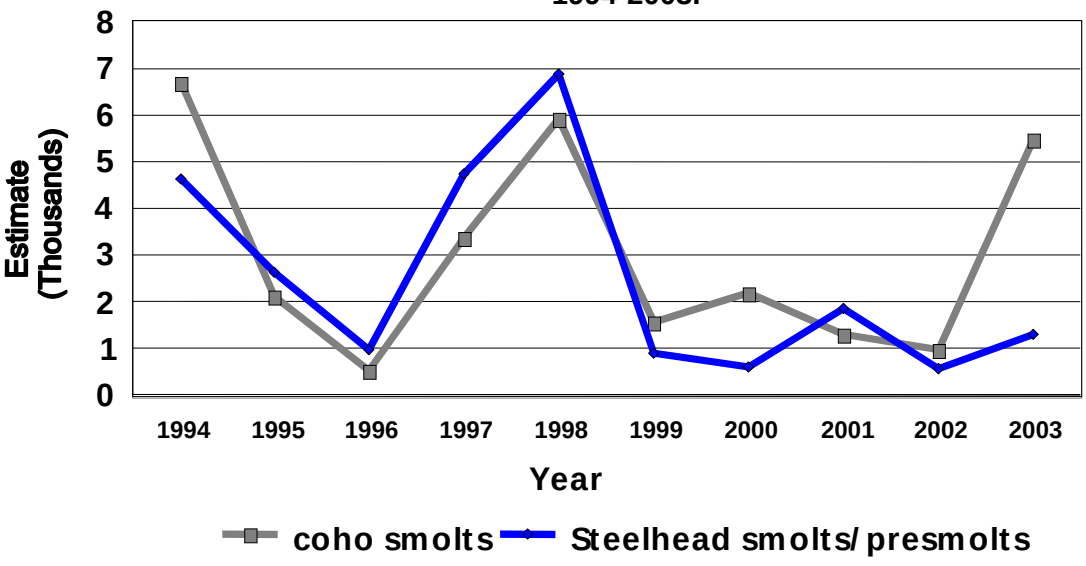
Figure 4. Estimated Coho Smolt Production from Watersheds of the Clackamas River 1994-2003



Upper Sandy River Smolt Production Monitoring

In 2003, the Zigzag Ranger District continued monitoring smolt production in the Upper Sandy River Basin. A new trap site at Clear Fork was initiated in 2003. Smolt trapping provides increased accuracy for monitoring recovery of upper Sandy River Basin stocks of threatened steelhead trout and coho salmon. Data will be incorporated into the Ecosystem Diagnostic Treatment (EDT) Model for estimating productivity in the Sandy River Basin along with ongoing salmon carcass enrichment projects at Clear Fork and Still Creek.

Figure 5. Still Creek Coho/Steelhead Smolts/presmolts Population estimate 1994-2003.



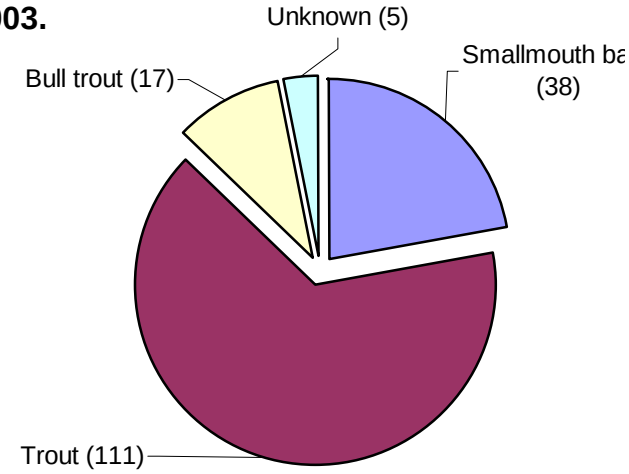
In 2003, a population estimate of 5,473 coho and 1,315 steelhead fish (juveniles and smolts combined) for Still Creek was attained. At Clear Fork, the population estimates were 1,327 coho and 1,002 steelhead. Figure 5 shows population estimates for Still Creek over the years.

Environmental education is also a key component of the Zigzag Ranger District smolt monitoring efforts. 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.

Laurance Lake Littoral Zone Survey

Invasive, non-native species are a growing concern on the Forest. Smallmouth bass, an introduced fish, are known to occupy Laurance Lake, but numbers and distribution are unknown. In 2003, biologists at Hood River Ranger District made the first attempt to determine the assemblage of fish in the shallow areas near the shore of Laurance Lake (the littoral zone). Results are shown below in Figure 6. Biologists are discussing next steps to further determine impacts of these invasive fish.

Figure 6. Laurance Lake Littoral Zone Snorkel Survey, July 2003. (number sighted)



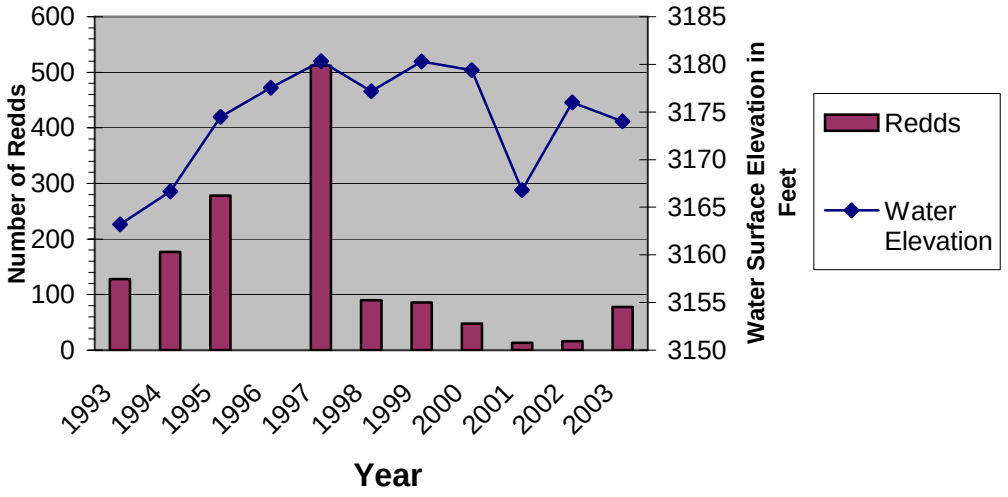
Bull Run Lake Cutthroat Trout Monitoring

In 2003, 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 producing wild population of coastal cutthroat trout. Since cutthroat trout are the only fish in the lake, this population is pure and is not subject to hybridization with other fish.

The drought during the winter of 2000-01, coupled with a water withdrawal made in the previous fall, resulted in the lowest lake levels since 1993. Spawners had difficulty accessing spawning streams. As a result, tributary redd counts in 2001 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 7). Redd counts for 2003 totaled 78 redds, up from the two previous low counts in 2002 and 2001. The jump in counts reflects earlier totals seen in 1998 and 1999. Recent data suggests that higher redd counts may be related to better flow conditions in the tributaries during the brood year egg incubation. Better tributary conditions during egg incubation will result in higher fry production and thus higher numbers of fry reaching adult spawning maturity four years later.

Monitoring of cutthroat trout in Bull Run Lake will continue as part of the Mitigation and Monitoring Plan developed by the Forest and the City of Portland Water Bureau to ensure continued viability of this isolated population.

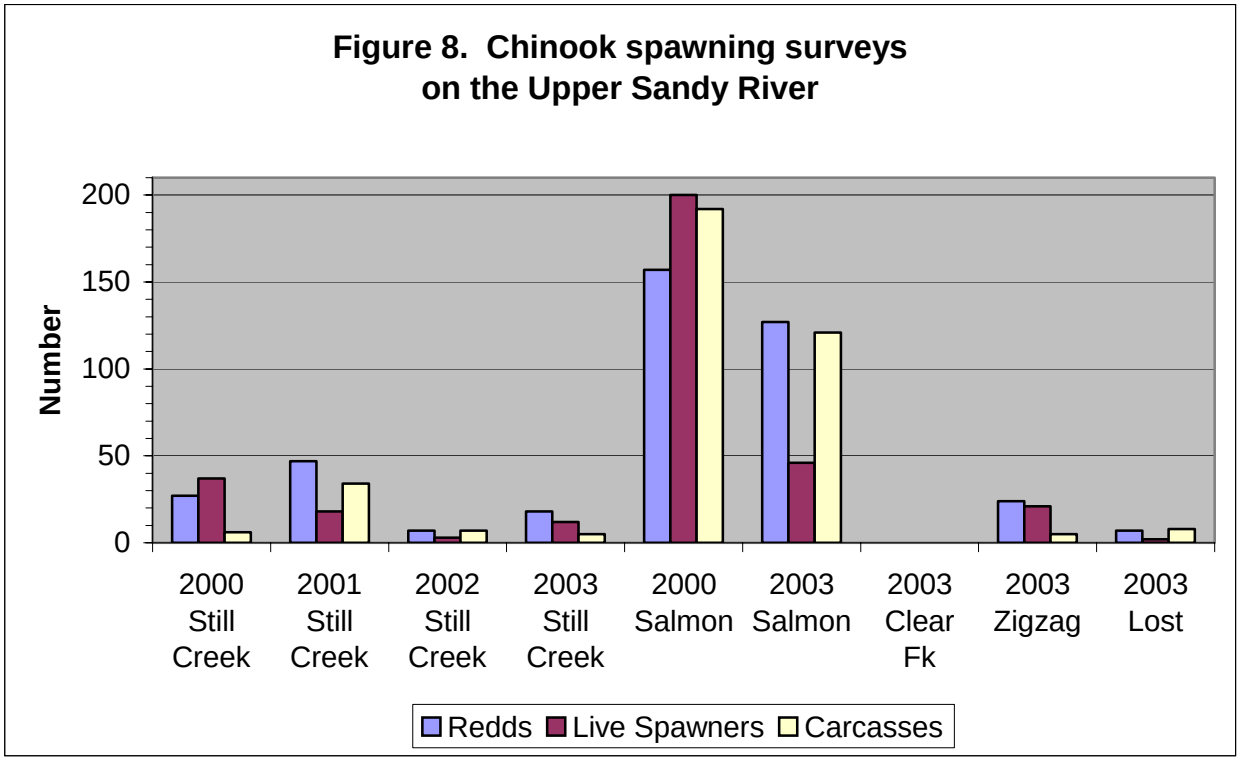
Figure 7. Bull Run Cutthroat Trout Redd Monitoring



Chinook Spawning Surveys

From September to October in 2003, the Zigzag Ranger District conducted spawning surveys for spring chinook in the Upper Sandy River Basin. Fisheries biologists from Zigzag Ranger District also adopted the new ODFW protocol. Survey streams were determined cooperatively between ODFW and Zigzag personnel. By coordinating survey efforts, more accurate and efficient surveys will result. As a result of the joint effort, the District was also able to conduct additional surveys on the Zigzag River, Lost Creek, and Clear Fork of the Sandy River. Spawner counts on Still Creek, Lost Creek, Zigzag River, and Clear Fork are from index reaches. The Salmon River count is taken from a 14-mile section from the mouth to Final Falls.

Results of chinook spawning surveys in tributaries of the upper Sandy River between 2000 and 2003 are shown in Figure 8.



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Chris Rossel, *Assistant District Fish Biologist – Barlow*
Paul Powers, *Detail - Assistant District Fish Biologist – Hood River*
Summer Crew – Annie Bourinski, Tony DePinto, Heidi Vogel, Kevin Mitchell

Zigzag Ranger District

Duane Bishop, *District Fish Biologist (503) 622-3191*
David Saiget, *Assistant District Fish Biologist*
Summer Crew – Burke Strobel (Teachers in the Woods Coordinator), Kathryn Arendt, Ron Guiles, Loren Meagher, Jason Clayton

Clackamas River Ranger District

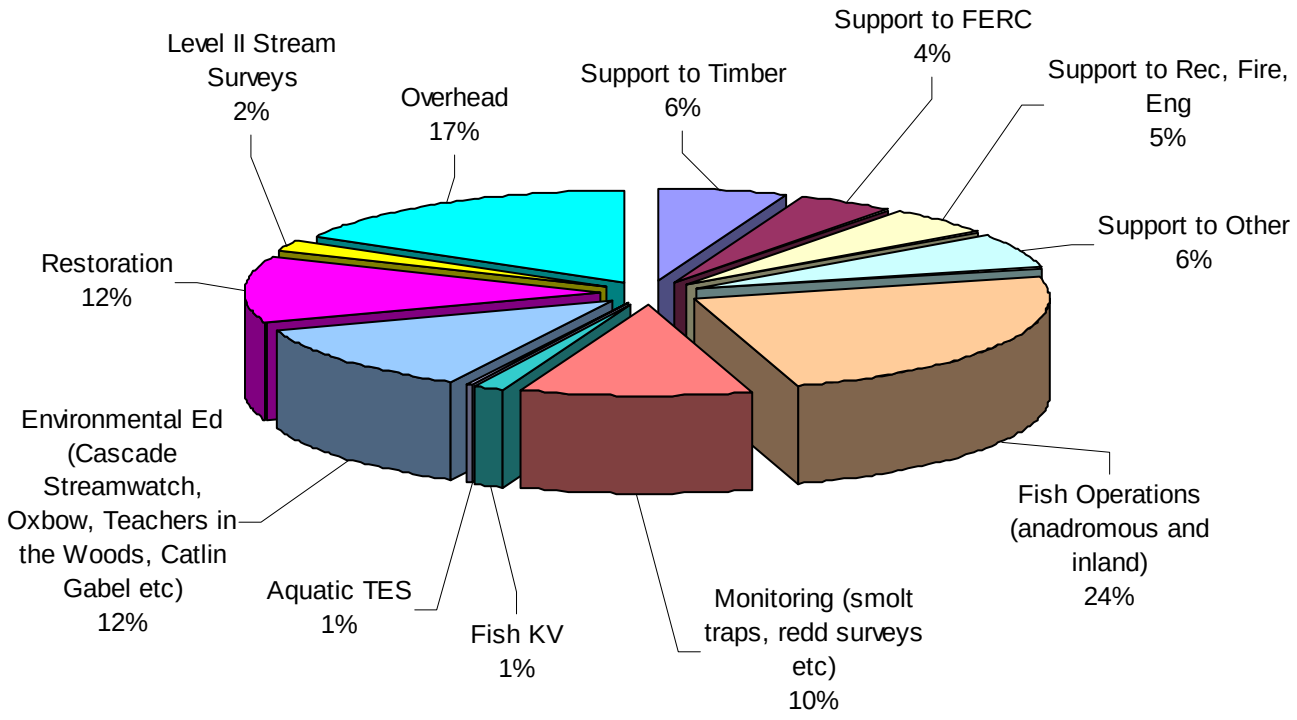
Tom Horning, *District Fish Biologist (503) 630-6861*
Bob Bergamini, *Assistant District Fish Biologist*
Sue Helgeson, *Fish Biologist*
Burke Strobel, *Fish Biologist and PNW Liaison*
Floyd Walker, *Fish Technician*
Summer Crew – Mark Schoenborn, Robin Miranda

Stream Survey Program

Katie Serres, *Program Coordinator (503) 630-6861*
Stream Survey Crew – Rose Christensen, Doug Runyan, Meaghan Hatfield, Bret Jensen

The total budget for the fisheries program on the Forest in 2003 was $1,445,427. Figure 9 displays the various allocations for program areas.

Figure 9. Fisheries Program Forest-wide Budget FY 2003.
Total Budget = $1,445,427



Thank You to Our Many Partners!

- Arrah Wanna Home Owners Association
- Association of Northwest Steelheaders
- Boy Scouts of America, Columbia Pacific Council – Camp Baldwin
- Bureau of Land Management
- Catlin Gabel High School
- City of Dufur
- Clackamas County
- 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 Initiative
- Metro
- Middle Fork Irrigation District
- Mt. Hood Community College
- Natural Resources Conservation Service
- Native Fish Society
- NOAA Fisheries
- Oregon Department of Environmental Quality
- Oregon Department of Fish and Wildlife
- Oregon Department of Forestry
- Oregon Trout
- Portland General Electric
- Portland Public Schools
- Portland State University
- Portland Water Bureau
- Salmon Corps
- Sandy River Basin Watershed Council
- Sandy River Hatchery (ODFW)
- The Dalles Water Bureau
- The Nature Conservancy
- The Resort at the Mountain
- Trout Unlimited – Tualatin Valley and Clackamas River Chapters
- U.S. Fish and Wildlife Service
- Wasco County Soil and Water Conservation District
- White River Watershed Council
- Wilderness Volunteers
- Wolftree, Inc.