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Department of
Agriculture
Forest Service

FOURTEENTH ANNUAL



MONITORING AND EVALUATION REPORT

Pacific
Northwest
Region 6

Gifford Pinchot National Forest Fiscal Year 2004





March 8, 2006

Dear Friends and Forest Users:

The renewed activity on Mount St. Helens was the most visible of many events that made 2004 an exciting year for the Forest. This is our 9th annual Monitoring Report. Nine years of Implementation Monitoring serves as a testament to our ability to do what we said we were going to do in our NEPA documents. In this report you will find a look back at prior year accomplishments.

We completed the NEPA analysis and began implementing vegetation management activities in the Gotchen area south of Mount Adams to address the forest health and hazardous fuels conditions. We made great progress on the White Pass Ski Area and the Hemlock Dam Fish Passage Environmental Impact Statements. I approved 17 County Payment projects that will reduce noxious weeds, repair roads, replace culverts and enhance watersheds. In 2004, we extinguished 45 wildfires. Forest staff on the Mount Adams and Cowlitz Valley Ranger Districts nurtured relationships with a broad cross-section of the community through our involvement with the Mt. Adams Resource Stewards and the GP Collaborative Working Group. Moreover, we met our goal of providing 17 million board feet of timber harvest to the local economy.

The primary purpose of this report is to share our success in implementing the goals and objectives of our 1990 Forest Plan as amended by the 1994 Northwest Forest Plan.

Results-at-a-Glance, beginning on page 3 of this report, provides a brief summary of the 30 items monitored and reported in Fiscal Year 2003 that relate to Forest Plan goals and objectives. The full reports follow, beginning on page 6.

There are many other monitoring activities underway on the Forest not strictly related to Forest Plan implementation. We have highlighted a few of those in the section titled Other Monitoring Activities, beginning on page 96.

Reports dating back to 1995 are posted on the Gifford Pinchot National Forest internet site at <http://www.fs.fed.us/gpnf/04projects/mgtdir/>. If you have ideas on activities or conditions you believe we should be monitoring, or you would like to participate in monitoring activities, please contact Earl Ford, Natural Resources Staff Officer and Forest Monitoring Coordinator, at (360) 891-5105 or eford@fs.fed.us.

I hope these reports provide you a better understanding and appreciation for how we care for your Forest.

Claire Lavendel

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Forest Supervisor



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A. Introduction

Monitoring and evaluation are important elements in the implementation of the Forest Plan. They are key to making the Plan a dynamic and responsive tool for managing a complex set of natural resources and values in a climate of social and economic change. This document reflects the twelfth year of implementing the Gifford Pinchot National Forest Plan, which was approved on June 1, 1990. It reports Forest activities and accomplishments of fiscal year and compares them to the amended Forest Plan.

The Plan was amended by the Northwest Forest Plan Record of Decision to incorporate new standards and guidelines to ensure protection of late-successional and aquatic ecosystems in April 1994.

Monitoring and Evaluation

There are three types of monitoring:

Implementation Monitoring: determines if goals, objectives, standards and guidelines are implemented as described in the Plan. The question being asked is, “Did we do what we said we would?”

Effectiveness Monitoring: determines if management practices as designed and implemented are effective in meeting the Plan goals and desired future conditions. The concern here is, “Did the management practice accomplish what we intended?”

Validation Monitoring: determines if data, assumptions, and coefficients are accurate. Here, the important question is, “Is there a better way to meet the Plan goals and objectives?”

Our monitoring effort emphasizes implementation monitoring, although several items contain elements of both implementation and effectiveness monitoring.

Evaluation is the analysis and interpretation of monitoring results. Essentially, the question being asked in evaluation is, “Are changes needed?” These changes may involve amending or revising the Plan or changing the way activities are implemented.

Organization of this Report:

Introduction - A brief overview of the monitoring report.

Monitoring Results - At a Glance - Summarizes monitoring results described in detail in Section D.

Monitoring Item Results - Displays the individual results, evaluations and recommended follow-up actions for all items monitored.

Accomplishments - Shows trends in program accomplishments over FYs 1999-2004 and compares accomplishments to our assigned targets (page 92).

Expenditures - Compares expenditures over the last 10 years and the composition of FY 2004 expenditures (page 93).



Forest Plan Amendments - Lists all Forest Plan amendments, and briefly describes the content of each, and when it was approved (page 94).

Other Monitoring Activities – This section highlights monitoring activities not directly related to implementation of the Forest Plan (page 96).

Glossary of Terms - Definitions of the technical terms used in this document (page 101).



B. Monitoring Results - At a Glance

The following table briefly summarizes monitoring results by resource area. Detailed information for each monitoring item can be found on the page referenced in Section D, beginning on page 6.

Monitoring items preceded with an asterisk in the table below are all or part effectiveness monitoring, others are primarily implementation monitoring. Refer to the Glossary for meanings of technical terms used in this report.

Monitoring Results - At A Glance	
RECREATION	☺ *Wild/Scenic Rivers (page 6)– The two projects in Wild and Scenic River Corridors met standards.
	☺ *Semi-Primitive Recreation (page 7) – The single project implemented in the semi-primitive ROS class met standards.
	☺ *Scenic Quality (page 8) – Projects in viewshed corridors met scenic quality objectives
	☹ *Wilderness Use and Condition (page 9) – Wilderness use is down slightly from 2003 levels. In heavily used areas, resource conditions continue to be degraded.
	☺ *Trail Condition, (page 12) – The six trails monitored met management level standards. User conflicts were reported on fewer than 10 percent of the system trails
	☹ *Recreation Use and Facility Condition (page 14) – Many developed sites are in need of repair or upgrading to meet standards.
HERITAGE RESOURCES	☺ *Heritage Resource Protection (page 16) – Protective measures were successful in 6 of the 7 historically significant projects.
WILDLIFE	☺ Raptors Habitat (page 27). – No proposed projects had the potential to affect these species or were implemented near known nest sites in 2004.
	☹ Legacy Features (page 27) – Objectives for down wood were not met on the Helitower Commercial Thin.
GRAZING	☹ *Grazing Practices (page 29) – The complexity of issues and funding shortfalls have delayed completion of the allotment management plan..
BOTANICAL	ⓘ Invasive Species (Noxious Weeds) (page 28) – Noxious weeds were treated on 115 acres Approximately 2,000 acres were monitored.
	☺ *Research Natural Areas (page 34) – RNA standards and guidelines were met in Butter Creek, Goat Marsh and TT Munger RNAs.
*All or part effectiveness monitoring.	
☺ Standard and guideline met, or no activities to monitor. ☹ Need for improvement	
ⓘ Information item, not a standard and guideline. ☹ Mixed results or mitigating circumstances.	



Monitoring Results - At A Glance (Continued)	
TIMBER	☺ Adequate Reforestation (page 18) – Three years after planting, 93 percent of acres monitored were adequately stocked. Only 2 acres were planted in FY 2004.
	ⓘ Harvest Methods (page 21) – Ninety-eight acres were harvested in 2003.
	☺ Regeneration Harvest Units Size (page 22) – No decisions were signed that contained regeneration units in 2003; there was nothing to monitor for this item.
	ⓘ Timber Volume Awarded (page 22) – In 2003 the Forest awarded 17 million board feet, slightly above the goal.
	☺ Silvicultural Prescriptions (page 23) – Thinning objectives were met in young stand and commercial thinning.
SOIL AND WATER	☺ Soil Productivity (page 67) – The harvest unit monitored met the standard for protection of soil productivity, only 1 percent of the area was adversely impacted.
	☹ Best Management Practices (page 69) – One departure was found on the Helitower Timber Sale.
	ⓘ Stream Temperature (page 71) – 25 streams on the Forest have a segment that exceeds the state standard for temperature.
FISHERIES	☹ Fish/Riparian S&G Implementation (page 38) – All harvest units were implemented in compliance with fish/riparian standards and guidelines.
	☺ *Effectiveness of Riparian S&Gs (page 42) – In all cases prescribed mitigations were followed and appear effective.
	ⓘ *Steelhead and Bull Trout Populations (page 45) – The steelhead count in the Wind River was the highest since 1988. The East Fork Lewis River wild steelhead count was the second highest since 1995. The bull trout population in Swift Reservoir was estimated at more than double the 10-year average.
	☺ *Effectiveness of In-Channel habitat Improvement Structures (page 53) – 100 structures were monitored in 2003.
COMMUNITIES	ⓘ Community Effects - Payments to Counties (page 87) - The U.S. Treasury returned over \$16 million dollars to the six counties with lands within the Forest administrative boundary. The Forest administered \$73 thousand in community assistance grants.
MINING	ⓘ Mining Operating Plans (page 89) – The Forest administered 25 Notices of Intent and 4 Plans of Operation in 2003. No cases of noncompliance were identified or reported.
ROADS	☹ Road Management (page 83) - The Forest is at 81 percent of the projected goal for road closures in Biological Winter Range. 342 miles of road have been decommissioned since 1994.
*All or part effectiveness monitoring.	



C. Trends in Standard and Guideline Compliance

Standard and Guideline	91	92	93	94	95	96	97	98	99	00	01	02	03	04	Plan Avg.	3-Year Avg
W&S Rivers	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
SP Recreation	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Scenic Quality	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Wilderness	☹	☹	☹	☹	☹	☹	☹	☹	☹	☹	☹	☹	☹	☹	☹	☹
Trail Condition	☺	☹	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Rec Facility		☹	☹	☹	☹	☹	☹	☹	☹	☹	☹	☹	☹	☹	☹	☹
Heritage Protection	☺	☺	☺	☺	☺	☹	☺	☺	☺	☹	☺	☺	☺	☺	☺	☺
Raptor Habitat	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Botanical SIA	☺	☺	☺	☺	☺	☺	☺	☺		☹					☺	☹
Legacy Features	☹	☹	☹	☹	☺	☺	☹	☹	☹	☺	☺	☺	☹	☹	☹	☹
Grazing Practices									☺	☺	☺	☺	☹	☹	☺	☹
RNA	☹	☺	☹	☹	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Reforestation	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Regen Unit Size	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Silv Rx	☹	☺		☺	☺	☹	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Soil Productivity	☹	☺	☹	☹	☺	☺	☺	☺	☹	☺	☺	☺	☺	☺	☺	☺
BMPs	☹	☹	☹	☹	☹	☹	☹	☺	☹	☹	☹	☹	☺	☹	☹	☹
Fish/Riparian							☹	☺	☺	☹	☺		☺	☹	☺	☺
Riparian Effectiveness							☺	☺	☺	☺	☺		☺	☺	☺	☺
In-Channel Effectiveness							☹	☹	☺	☺	☺		☺	☺	☺	☺
Road Management	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☹	☺	☺
S&G Average	☹	☺	☹	☹	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺



D. Monitoring Results

Wild and Scenic Rivers 1 ☺



Figure 1 - Little White Salmon River

Introduction: On the Gifford Pinchot National Forest there are no Congressionally designated Wild, Scenic or Recreational Rivers. However, the Forest Plan recommends the Lewis River, Cispus River, and the Muddy Fork and Clear Fork of the Cowlitz River be designated as Wild and Scenic Rivers. Upper White Salmon River was recommended for Wild and Scenic River designation as a result of the 1997 Final Legislative Environmental Impact Statement. In addition, twelve other rivers are recommended for further study. In early 2005, Senator Cantwell and Representative Baird introduced legislation to designate 20 miles of river segments of the Upper White Salmon and Cascade Creek. Segments within the Mount Adams Wilderness would be designated as Wild and segments outside the Wilderness would be designated as Scenic.

Senator Cantwell and Representative Baird have introduced legislation to designate a portion of the Upper White Salmon River as Wild and Scenic.

Until Congress takes action on the Forest's recommendation or further studies are completed, values are being protected for which these corridors were either recommended or deemed eligible for recommendation. The Forest monitors activities in each of these corridors to ensure that the outstandingly remarkable river values are being protected consistent with the Wild and Scenic Rivers Act.



Results: All projects within potential Wild and Scenic River corridors were monitored. The results are displayed in Table 1.

Table 1 - Monitoring in Potential Wild and Scenic River Corridors

Corridor	Project	Standards Met
Upper White Salmon	Trail Maintenance (Buck Creek #54, Salt Creek #75, PCT #2000)	Yes
Lewis	Trail Bridge Replacement	Yes

Evaluation: Trail maintenance of the existing trail tread on the Upper White Salmon had no impact to outstandingly remarkable values, the free-flowing nature, or classification of the river. Two trail bridges on the Lewis River Trail were replaced during the summer season of 2004, one at Copper Creek and the other at Cussed Hollow Creek. The new bridges were replacements for deteriorating bridges, and were installed in the same locations. No change in Wild and Scenic River eligibility resulted from the project.

The character of the wild and scenic river corridors was preserved.

Recommended Action to be Taken: No corrective action required—monitoring to continue.

Semi-Primitive Recreation 2 ☺

Introduction: The Forest Plan provides a framework for managing different classes of outdoor recreation settings, activities and opportunities. This framework is a continuum comprised of seven classes: Primitive, Semi-primitive Non-motorized, Semi-primitive Motorized, Roaded Modified, Roaded Natural, Rural and Urban. This monitoring item focuses on maintaining the character of the two semi-primitive classes. The emphasis in these areas is to maintain a predominantly natural or naturally appearing environment. Motorized recreation use is not permitted in the semi-primitive non-motorized category.

The project implemented in the semi-primitive ROS class complies with standards and guidelines.

Results: In addition to ongoing routine trail maintenance, one project was planned in a semi-primitive recreation area as identified in the Forest Plan. Portions of the Craggy Peak Trail No. 3 and Wright Meadow trail No. 80 were restored in a heavy maintenance project.

Evaluation: Trail maintenance and the Craggy Peak Trail #3 restoration were consistent with the ROS class and in compliance with the Plan standards and guidelines. The semi-primitive character of the area will be maintained.

Recommended Action to be Taken: No corrective action required—monitoring to continue.



Scenic Quality 3 😊

Introduction: The Forest Plan delineated 37 viewshed corridors across the Forest. Lands within view of 21 of these viewshed corridors have management objectives requiring maintaining or improving scenic values. In these viewsheds, management activities are to be compatible with scenic quality objectives.

Results: Projects that occurred within scenic viewshed corridors are listed in Table 2.

Table 2 - Visual Quality Monitoring

Project Name / Type	Location	Status	Field or Office Review	Standards Met
Whip Timber Sale	Rd 24 VM	Partially Completed	Field	Yes
Trail Maintenance	Rd 82 VL Rd 80 VM Rd 24 VM Rd 23 VM Rd 30 VM Sleeping Beauty- 9L	Completed	Field	Yes
Road Maintenance and brushing	Forest wide scenic roads	Completed	Field	Yes
Meta Lake Trail Construction	Rd 99 AA	Completed	Field	Yes
Lewis River Trail Bridge Replacement	Rd 90 NA	Completed	Field	Yes

Logging on several Whip Timber Sale units was completed adjacent to Road 24. Slash disposal, however, was not completed. Units were commercial thinnings and did not result in any openings. Resulting canopy cover of 50 percent meets retention visual quality objectives.

Trail maintenance occurred on many trails, which pass through scenic corridors or scenic viewsheds. Trail maintenance met all standards and guidelines.

Road maintenance and brushing occurred along the major Forest roads that are the basis for the scenic corridors. Road maintenance and brushing met all standards and guidelines.

Mount St. Helens projects repaved the Meta Lake barrier-free trail, and reconstructed 120 feet of boardwalk damaged by snow where it crosses Meta Lake Creek. Trail bridges were replaced on the Lewis River Trail

Road and trail maintenance met all visual quality standards and guidelines in 2004.

at Copper Creek and Cussed Hollow Creek. All standards were met, as the projects created no change to the environment, or the existing situation.

No Landscape-scale viewshed condition monitoring was conducted in 2004.

Recommended Action to be Taken: No corrective action required—monitoring to continue.

Wilderness Use and Condition 4 ☹️

Introduction: The Forest currently has about 180,000 acres in seven wildernesses. Each wilderness is zoned according to the nature of recreation opportunity. The range of these opportunities is called the Wilderness Recreation Opportunity Spectrum. Each category has a set of standards describing the desired recreation experience. Periodic monitoring determines if standards for the experience in each category have been met. It measures wilderness use and impacts of recreation use on wilderness character.

The Forest includes 180,000 acres in seven wildernesses.

A limit of acceptable change is a measure of impacts associated with wilderness recreation use such as trampled area, vegetation loss at campsites, and mineral soil exposed. It is usually done on a three to five years frequency, the amount of time necessary to see measurable change occur. Monitoring done in previous years provides a baseline for determining if management measures are working to reduce impacts. Resource conditions that are degrading rather than improving are a clear indication of the needs for additional corrective actions.

In 1999, the Forest, with input by wilderness users and other interested parties, developed a Wilderness Resource Protection Plan that includes measures such as designated sites in overused areas, use limits, and increased education and enforcement. The primary purpose of these measures is to reduce impacts from human use, primarily overnight use.

Results:

Wilderness Use - In 2004, annual visitor use decreased slightly by 16 percent across all seven wildernesses (Table 3). The largest increase from 2003 to 2004 was 40 percent in the Glacier View Wilderness (Figure 2). The South Climb portion of Mt. Adams Wilderness, historically popular with climbers, had record high use equivalent to 100% of the Forest Plan level and exceeding that for the entire remainder of Mt. Adams Wilderness.

Wilderness visitor use declined in 2004.

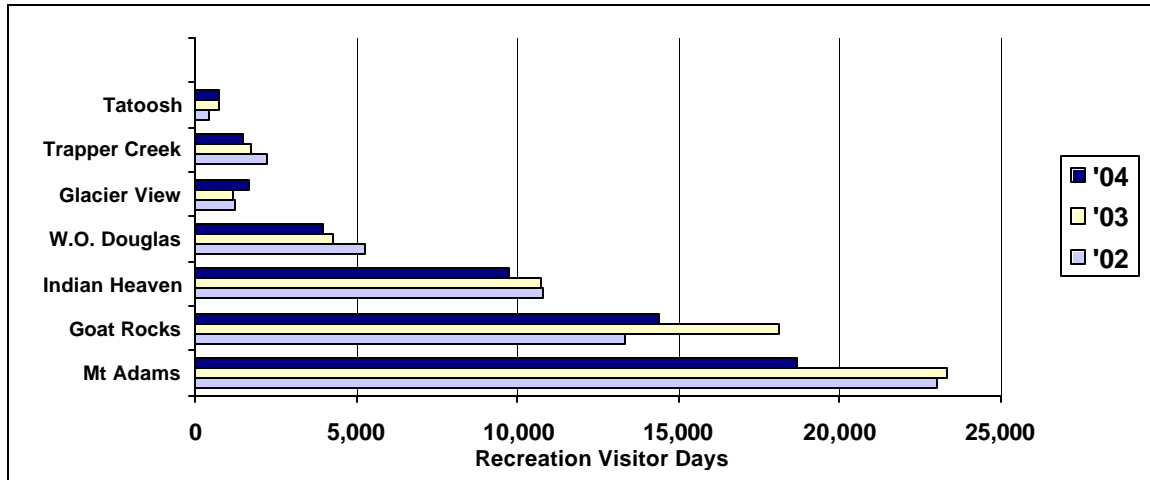


Figure 2 - Wilderness Use 2002 - 2004

Table 3 - Wilderness Use Recreation Visitor Days

Wilderness	Recreation Visitor Days							
	1998	1999	2000	2001	2002	2003	2004	2003-2004 % Change
Mt. Adams	22,400	19,620	27,200	25,810	23,030	23,300	18,674	-20%
Goat Rocks *	21,250	12,730	17,500	18,760	13,340	18,080	14,409	-20%
Indian Heaven	12,000	8,968	11,200	12,770	10,760	10,700	9,731	-9%
William O. Douglas *	8,920	6,370	7,000	6,420	5,270	4,240	3,920	-8%
Glacier View	4,300	2,100	3,200	2,730	1,240	1,160	1,629	40%
Trapper Creek	2,200	2,190	2,500	2,600	2,220	1,720	1,434	-17%
Tatoosh	1,100	910	1,000	860	410	740	704	-5%
TOTAL	72,170	52,888	69,600	69,950	56,270	59,940	50,501	-16%

*Gifford Pinchot National Forest portion only.

Limits of Acceptable Change (LAC) In Goat Rocks Wilderness, site specific monitoring of 42 sites (13% of the known sites in the Goat Rocks Wilderness) in 3 areas was conducted. Results were compared with monitoring results from 1990. Standards were not met in two of the three areas, Packwood Lake and Alpine Camp. New sites had been created, and the average campsite condition



had deteriorated. In Snowgrass Flats, measures to reduce impacts, such as closing the area to camping, resulted in improved conditions at all monitored campsites.

Evaluation: Overall wilderness use decreased slightly since 2003. In 2004, popular camping destinations in Mt. Adams, Indian Heaven and Goat Rocks Wildernesses continued to receive heavy peak weekend use, particularly in August.

Measures, such as rehabilitation, education, attempts to confine damages to previously impacted areas and designating campsites, have worked to some degree to reduce soil and vegetation impacts.

Standards were not met at Packwood Lake and Alpine Camp.

Snowmobile incursions into the Mt. Adams Wilderness were less frequent than in previous years. Corrective actions implemented in 2003 and 2004 included increased winter recreation education and enforcement, changes in Sno-Park uses, and boundary signing.

Recommended Actions to be Taken: LAC monitoring should continue. The need to implement additional measures to reduce resource impacts should be evaluated annually.



Trail Inventory and Condition ☺

Introduction: On the Forest there are 1,484 miles of trails, including 305 miles within wilderness. These trails are managed to maintain a diverse array of

On the Forest, there are 1,484 miles of trails, including 305 miles within Wilderness.

travel opportunities. Difficulty, mode of travel, and distance are factors affecting the mix of travel opportunities. Each Forest trail is assigned a trail management level, with associated standards and guidelines for management of adjacent lands. These management levels offer a range of protection from

road and timber harvest impacts. We also monitor the amount of trail construction, maintenance, use, and management.

Results: Table 4 compares the amount of trails constructed or reconstructed in 2004 with the amount projected in the Forest Plan. Construction or reconstruction work was accomplished on the following trails: Fossil Trail #242, Lakes Trail #211, Boundary Trail #1, East Crater Trail #48, PCT #2000, Wicky Shelter Trail #39A, Buck Creek Trail Extension #54, Wicky Creek Trail #38.

Table 4 - Trail Construction and Maintenance

Trail Activity	Miles from Forest Plan	2004 - Miles Accomplished	Percent of Plan Level
Construction or Reconstruction	23 ^{1/}	1.2	5
Maintenance	1484	873.0	59

^{1/} Trail mileage average based on projected annual outputs in the second decade, Forest Plan Fig IV-1.

Approximately 873 miles (59 percent) of the 1,484 miles of the existing summer and winter use trails in the Forest Trail System were maintained to full Meaningful Measures Standards (see Glossary). Most trails where maintenance was deferred were low priority, low use, or did not require maintenance. Trail maintenance mileage increased from 831 miles in 2003 to 873.4 miles in 2004 (Table 4).

873 miles of trails were maintained to standard.

Trail Setting - Lemei Trail #34, Siouxon Trail #130, and Camp Creek Falls Trail #260 met all management standards (Table 5). Trails were reviewed either in the planning phase (through the review of planning documents) or on the ground. The other three trails met management standards, but sections do not meet trail maintenance standards due to poor trail location, wet conditions or motorized use. Sections of Service Trail #35 which are degrading aquatic resources are scheduled for reconstruction in 2005.

**Table 5 - Trail Setting**

Trail Reviewed Name and No.	Planned Mgt. Level	Meets Management Level Setting Standards in Plan
Service Trail #35	III	Y
Lemei Trail #34	II	Y
Lewis River #30	I	Y
Siouxon #130	II	Y
Camp Creek Falls #260	II	Y
Boundary Trail #1	II	Y

Trail Use – The Forest responded to public comments concerning conflicts on several trails across the Forest. A number of incidents of illegal or unauthorized uses were reported on Forest trails. Illegal use of snowmobiles was reported on the South Climb Trail #183, illegal bicycle use was reported on the Pacific Crest National Scenic Trail #2000, and motorized use of Silver Star Trail #180 was reported. Reports of user conflicts between hikers and stock users were also reported on some wilderness trails. Monitoring of use will continue.

Only 37% of the planned trail construction was accomplished due to budget limitations.

Evaluation: There is currently no specific planned target for trail construction/reconstruction in the Forest Plan, other than the general average of 23 miles per year established as a planned output for the second decade of Forest Plan implementation. The budget for this work is considerably less than is needed to reconstruct a deteriorating trail system and create new opportunities. User conflicts were reported on fewer than 10 percent of the system trails and thus do not trigger planning action.

Increased illegal OHV use has been observed in some areas, particularly the Upper Cispus Watershed.

Recommended Action to be taken: In 2005, revenues from NW Forest Pass user-fees will continue to provide funding to maintain trailheads and the trails they serve, although the number of trailheads in the program has decreased as the Northwest Forest Pass has been increasingly targeted for more highly developed recreation sites. The expected result is an improved ability to meet trail operation and maintenance standards for fee site related trails. Leveraged funding and volunteer trail maintenance will continue to contribute to the Forest trail system maintenance.

Motorized/non-motorized trail designations will be addressed in the Forest OHV planning document scheduled for FY 2007.



Developed and Dispersed Recreation Use and Facility

Condition 7 ☹️

Introduction: The Forest has about 120 developed recreation sites, not including visitor centers, with a combined capacity of 16,650 persons-at-one-time (PAOT). We have experienced increasing demand for recreation opportunities from the fast growing populations of the Portland metropolitan area and the international notoriety of Mount St. Helens and the Columbia River Gorge. Accompanying the growth in demand has been relatively stable recreation budgets. The Forest has pursued some innovative measures to close the gap between demand for services and the recreation budget through partnerships, volunteers, user fees and use of campground concessionaires. In 2000, the Northwest Forest Pass was introduced and provided a means to collect additional revenue from trail, interpretive site and rustic campground users at selected sites. The revenue from this user fee has helped to meet operation and maintenance standards for these sites.

Deferred maintenance was accomplished on four developed sites.

Eighteen fee campgrounds were operated by a concessionaire. The concessionaire also operated some day-use sites in 2004. Concessionaire sites are managed to standard since sites are operated and maintained according to the concessionaires' operating plan approved by the Forest Service. In 2004, eight Forest Service-operated campgrounds generated camping fees that went toward operation and maintenance of these sites.

Camping outside of campgrounds (dispersed camping) continues to be popular and use is increasing. There are currently few restrictions on where visitors may camp. Since the preference for camping is to be near water, this is where the majority of use of this type occurs.

Results: The Forest is continuing to pursue upgrading of developed recreation facilities. In 2004, some deferred maintenance was accomplished at Lava Canyon, Morrison Creek Campground, Peterson Information Shelter, Mt. Adams Horse Camp, and Snow King SnoPark. However, in spite of these projects, many developed sites are still in need of repair or upgrading to meet new standards.

Numerous dispersed camping sites show evidence of over use.

Visitor centers at Mount St. Helens are accruing deferred maintenance due to their age and heavy use. A survey of maintenance needs was conducted, priorities set, and funding options identified. For the long-term, the Forest is exploring partnership options for their operation and maintenance.

Monitoring of recreation use outside of campgrounds indicates numerous dispersed camping sites, accessible by vehicle, are continuing to show evidence of overuse. Concerns include inadequate sanitation, resource damage, littering, illegal tree removal, trash dumping, user conflicts, and user-created sites located too close to streams, lakes, and scenic highways.



Ongoing actions include: blocking vehicle access to sensitive riparian areas, restoring impacted sites, designating approved dispersed campsites, and increasing enforcement. The annual “Pick-up the Pinchot” is an example of a successful volunteer effort to assist in cleaning trash from dispersed sites around the Forest. Planning efforts to address rehabilitation of dispersed sites have been undertaken in the East Fork Lewis River, the Wind River and the Cispus and Cowlitz Rivers.

Evaluation: While progress was made in upgrading toilet facilities, many recreation facilities continue to show the need for reconstruction or heavy maintenance. Deferring routine maintenance of these facilities has resulted in a devaluation of the capital investment and increased maintenance costs. Condition surveys of developed recreation sites indicate that many still do not meet accessibility or sanitation standards. Monitoring of dispersed recreation camping sites indicates that many of these sites do not meet standards and are impacting riparian areas.

Condition surveys of developed recreation sites indicate that the majority do not meet accessibility or sanitation standards.

Recommended Actions to be taken: The Forest will continue to evaluate the ability to meet existing and future developed recreation needs, while providing facilities that meet operation, maintenance, and accessibility standards. A Recreation Facility Master Plan is scheduled to be prepared in 2006. Some revenues from the Northwest Forest Pass program will be focused on capital improvements. Other funding sources will be pursued.

To address dispersed recreation camping impacts, closure to camping of areas adjacent to some roads should be considered. Dispersed recreation management should be addressed in conjunction with other planning efforts such as transportation planning and watershed and habitat restoration.



Heritage Resource Protection 11 ☺

Introduction: Heritage Resources identified in the project survey and inventory process are evaluated to determine their significance. The level of significance is measured by the criteria of the National Register of Historic Places. Projects are usually designed to protect significant sites through avoidance. In rare cases, effects are mitigated through archaeological data recovery methods, including scientific excavation and analysis. In the case of historic structures, mitigation may take the form of detailed architectural documentation.

Typical heritage site protection strategies involve the maintenance of non-activity buffer zones. Monitoring ensures that prescribed protective measures were properly implemented in the field. Monitoring also provides an opportunity to evaluate the effectiveness of various protective strategies.

Results: There were 14 heritage resource sites associated with seven projects implemented during Fiscal Year 2004. The projects included the following:

Table 6 - Projects associated with heritage sites

Project	Location
Peterson Prairie Guard Station Toilet	Mt. Adams District
Middle/Service Trail Reconstruction	Mt. Adams District
Oklahoma Campground Toilet Replacement	Mt. Adams District
Lewis River Trail Reconstruction	Mount St. Helens NVM
East Fork Road to River Reconstruction	Mount St. Helens NVM
Forest Road 42, Phase II Enhancement	Mount St. Helens NVM
Packwood Lake Guard Cabin Rehabilitation	Cowlitz Valley District

Eleven of the heritage resource sites identified in these projects were found to be significant. Two sites were not evaluated. The sites include eight prehistoric archaeological sites, a site with culturally modified trees (peeled cedars), a historic period archaeological site, two historic buildings, and two historic trails.

With the exception of the Packwood Lake Guard Cabin Rehabilitation, avoidance measures were prescribed for all of the projects. In most cases, protective non-activity buffers range from 10 to 60 meters. In the case of the Packwood Lake Guard Cabin (Figure 3), project work involved restoration and rehabilitation of the historic building, previously determined eligible to the National Register of Historic Places. In-kind replacement of deteriorated wall logs and roof materials was accomplished to comply with the State Historic Preservation Officer’s “No Adverse Effect” determination. Archaeological monitoring was conducted to ensure protection of an associated archaeological site.



Evaluation: Protective measures were successful in all but one case. Activities associated with the Lewis River Trail Reconstruction Project resulted in ground disturbance within the boundaries of prehistoric archaeological site 45SA359. A Forest Service Contract Officer's Representative permitted a contractor to operate construction machinery on the archaeological site, contrary to stipulated avoidance measures. A field assessment by the Forest Archaeologist indicates that soil disturbance did not penetrate the deeply buried cultural stratum.

Recommended Actions: Federal regulations and procedures under 36 CFR 800.13(b), including notification of Tribes and the State Historic Preservation Officer (SHPO), were completed following the incident at archaeological site 45SA359. An archaeological damage assessment report is in preparation, and will be completed during Fiscal Year 2005. SHPO has requested that the Forest develop and implement heritage resource sensitivity training for Contract Officer Representatives and Inspectors.



Figure 3 - Packwood Lake Guard Cabin

The historic Packwood Lake Guard Cabin was built in 1910 by the Valley Development Company, an early hydroelectric power interest, and later used as a Forest Service Ranger Station. Photograph shows appearance of cabin near the completion of the 2004 project listed above.



Reforestation 50 😊

Planting - In 2004 the Forest planted only 2 acres. With this planting, which occurred within the Jammin 9 Fire area, the Forest has completed initial planting of past sales where regeneration harvest treatments were applied, or where planting was needed after a disturbance, such as fire.

Planting is only the first step in a successful planting program. Maintenance of plantations to assure that seedlings are successfully established and growing is the next step. A variety of factors can prevent successful establishment, including site conditions (i.e. shrubs overtopping seedlings), environmental extremes such as drought or frost, and animal damage such as from pocket gophers or big game wildlife species. To assure that plantations are established, surviving and growing, the Forest performs stocking surveys to assure that none of these factors are significant enough to prevent the targeted number of seedlings from becoming established after 5 years. During 2004, the Forest completed 1,200 acres of stocking surveys. Two hundred thirty-nine of these were certified as adequately stocked. Forty-six acres were identified and treated to reduce mortality from pocket gophers. The rest of the plantations are growing well and meet Forest Plan minimum stocking standards. They will be monitored for one to two more years to assure they are adequately stocked.

Timber Stand Improvement - Thinning in young stands (stands less than 20 years old) continues to be an emphasis on the Forest. In the Matrix allocation, this program concentrates on plantations with a goal of reducing conifer stocking to density levels that maintain vigorous stand growth, reduce the impacts of insects and disease and maintain options for the future treatments. Within Late Successional Reserves and Riparian Zones thinning is done for the same reasons but also to begin to develop structural and diversity characteristics that will assist these stands in developing late successional characteristics such as large trees, snags and downed wood. Examples of things that are done include the creation of small openings, using variable spacing techniques throughout the stand, and leaving uncommon tree species such as cedar or cottonwood. This year the Forest completed 2,408 acres of young stand thinning across the Forest.



Figure 4 - 1979 Ruth Burn

The 302-acre young stand thinning project in the Ruth Burn of 1979 (Figure 4) was a component of the Canyon Basin Restoration Thinning Phase Two under Gifford Pinchot Title II Funding. Due to heavy stocking on a low quality site, stress was evident. Saplings may recover after thinning provides growing space to improve health and vigor of stand.

Community support for young stand thinning continues to show in funding awarded from both the North and South Regional Advisory Committees (RAC). In addition, the Rocky Mountain Elk foundation (RMEF) was a significant contributor to the young stand thinning/release work on the Forest. These two sources of funding accounted for close to 67 percent of the Forest young stand thinning/release acre accomplishments. The rest came from a combination of Knutson-Vandenburg Funds and appropriated monies.

Pruning noble fir for boughs on the Forest continues to provide jobs and product into the local economies. It is also an important source of revenue both to the economy and is a source for getting additional work done on the ground. KV funds collected from these sales are being utilized to thin and fertilize conifer stands to produce a future harvest of high quality material as well as to thin young stands. In 2004, the Forest hand-fertilized approximately 250 acres of noble fir dominated stands, and thinned 326 acres.

White Pine blister rust continues to be a problem for western white pine in older plantations that were planted with non-resistant seedlings. Pruning continues to be the most effective method of treatment to reduce the potential for new infections. In 2004 the Forest pruned 36 acres of white pine stands to



minimize the spread of this disease. Low funding levels in the past have limited our ability to identify stands dominated by western white pine that would benefit from blister rust pruning. However, in 2004 the Forest received monies from the Forest Health Program to complete 4,000 acres of surveys to determine need for pruning treatment. About 2,000 additional acres were identified for future blister rust pruning based on this survey. The Forest will be actively seeking funding to complete this work in 2005 and 2006.



Timber Harvest Methods ⁵¹

Harvesting methods conducted on the Forest in 2003 are identified in Table 7. Ninety-eight acres of commercial thinning was completed. An additional 3,200 cords were harvested as firewood. Acres of firewood harvest were not estimated.

Only 98 acres were harvested in 2003

Table 7 - Timber Harvest Methods

Silvicultural Practice	2003 Acres	NW Forest Plan Projection	Percent of Projection
Clearcut Harvest	0	0	-
Regeneration Harvest	0	1,454	0
Commercial Thinning	98	1,264	8
Salvage	0	N/A	-
Firewood	N/A	N/A	-
Totals	98	2,718 acres	< 4

Figure 5 displays the harvest methods used on the Forest from 1990 to 2003. This clearly shows the dramatic reduction in clearcut harvest early in the 1990s.

Figure 5 also shows that the last clearcuts on the Forest were harvested in 1995. Since 1995, the first year Northwest Forest Plan was in effect, about a third the Plan projection of 2,700 acres per year has been harvested on average.

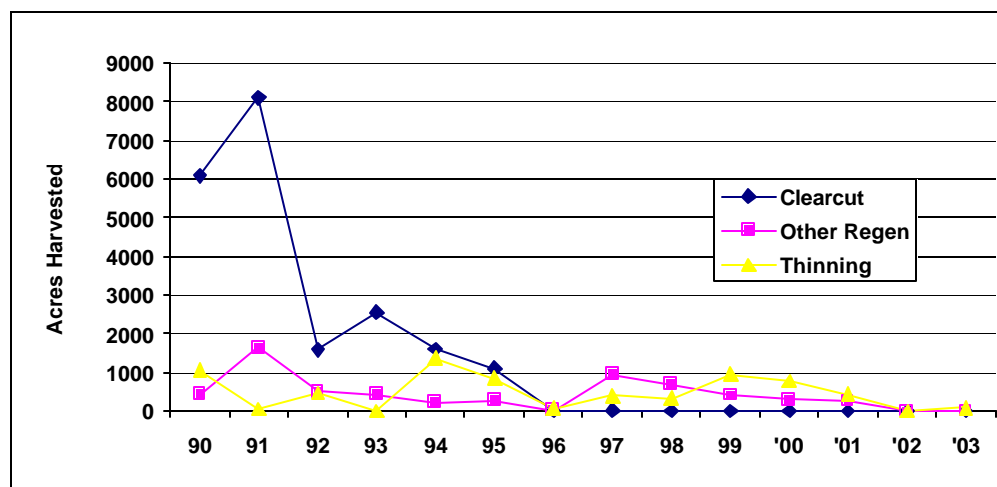


Figure 5- Historical Harvest by Method



Regeneration Harvest Units Size ⁵² 😊

Monitoring regeneration harvest units size determines whether timber sales that had NEPA decisions signed during the fiscal year containing regeneration harvest units meet the objectives of size, separation, and natural appearance defined in the Regional guidelines for timber sale preparation.

No NEPA decisions were signed in 2003 for sales that included regeneration harvest units.

During 2003 this item was not applicable because no decisions were signed that contained regeneration units.

Recommended Action to Be Taken:

No corrective action needed, continue monitoring.

Timber Volume Awarded ⁵⁴ ⓘ

The 2004 sale goal was 16.9 million board feet (MMBF) (32.5 MCCF) of new sales. The Forest met this target. Actual volume awarded from sales in 2004 was 17 MMBF or 32.5 MCCF of new sales. Treatment acres totaled approximately 1,400 acres. All of this volume came from commercial harvest using retention harvest treatments.

Table 8 - Volume sold in FY 2004

Volume Sold MMBF	Volume sold MCCF	Projected Volume MMBF	Projected Volume MCCF	% of Projection	Remaining MMBF Under Contract
17	32.5	16.9	32.5	100.3%	27

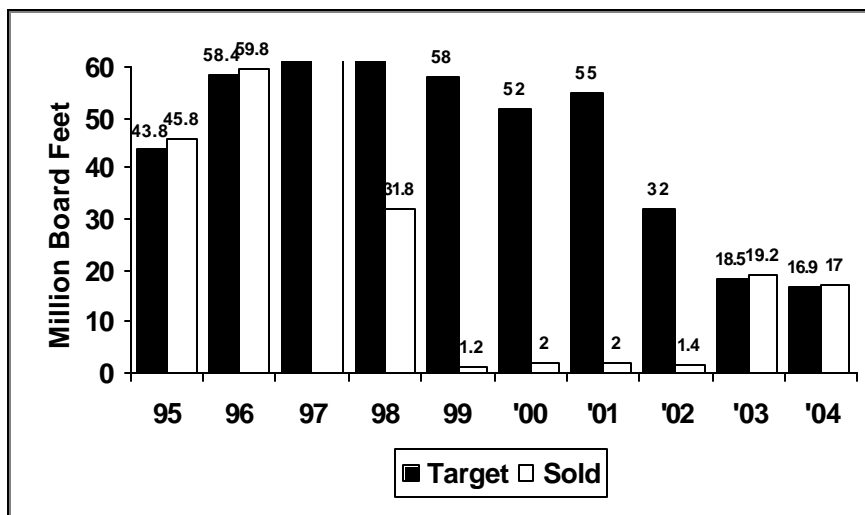


Figure 6 - Target Accomplishment

Silvicultural Prescriptions 56 

Introduction: Vegetation management on the Gifford Pinchot is dynamic. It varies based on the current condition of the vegetation and is blended with the goals and objectives identified in the Northwest Forest Plan. The Forest monitors overall condition with a number of tools including permanent inventory plots and field level inventories that are maintained within a Forest geographic information system (GIS). For example, recent analysis of this information has shown that the Forest has an increasing backlog of thinning needs within all land allocations. It is estimated that the Forest has approximately 33,000 acres of stands in need of thinning within the 41-80 year old age class and another 70,000 acres in the 81-120 year old age class.

2004 Sale Program - In 2004 the timber sale program was developed around both retention harvest and commercial thinning. Of the large sales sold during 2004, 533 acres are prescribed for treatment with commercial thinning and 576 acres have a retention harvest prescription. These sales will be implemented within the next 2-3 years.

The majority of the commercial thinning on the Forest was awarded on the Cowlitz Valley Ranger District around Iron Creek and Galena Creek. One blow-down salvage sale also occurred in the Skate Creek area. These sales occurred in stands that were 40 to 80 years old with the exception of Skate Creek. This sale, called Smoke Salvage removed blowdown timber from within an 80 to 100 year old stand. This blowdown acted as a thinning with no major openings created and no regeneration was planned. The overall goal of the thinning sales is to enhance growth on residual trees, provide volume to the community and maintain overall options for future treatment in these stands by maintaining diversity and structural components to meet other resource needs. To increase diversity, variable density thinning is being utilized. An example where treatments were used to increase diversity is the Galena Timber Sale. The treatments in this sale do the following: 1) reduce overall stocking in the Douglas-fir and hemlock to minimize overall stress on the leave trees; 2) remove overstory conifers from around well developed big leaf maple clumps within the stand to prevent loss of these trees to shade induced mortality; 3) maintain leave islands in the stand that have a good combination of remnant snags and down wood and 4) treat most aggressive root rot pockets within the stand to minimize the impacts of Phellinus root rot and plant these openings where needed with species such as western white pine. The result of this treatment is expected to increase both the vertical and horizontal diversity within the stand.

A combination of commercial thinning and retention harvest sales were sold on Mount St. Helens and Mt. Adams Ranger Districts. Commercial thinning treatments were similar in objective to those on the Cowlitz Valley Ranger District in trying to thin heavily stocked stands to maintain overall vigor and health and to provide for a diversity of species. Retention harvests were designed to allow for the introduction of early seral species such as Douglas-



fir. All retention harvests will leave from 15 to 50 percent canopy cover, and will be planted.

The Forest completed the preparation of the Stray Cat Timber Sale in 2004. This sale is a product of a recently completed Environmental Impact Statement of the Gotchen area located just east of Trout Lake, Washington. This area has been of significant concern to the Forest and local citizens with regard to the effects of continued budworm defoliation and mortality caused by a variety of insects and diseases. This sale will treat approximately 650 acres of dead and dying trees within the Gotchen landscape, as well as minimize the potential for significant insect and disease damage in the future. It will be sold in the spring of 2005.

This year's implementation monitoring program for vegetation management of forested stands looked at silviculture prescriptions in two specific areas:

- Thinning of young stands (less than 30 years old), and
- Treatments in those older stands (greater than 40 years old) that are in need of thinning or regeneration prescriptions.

Silvicultural prescriptions are the mechanism that takes Forest Plan direction and the specific requirements identified in NEPA, and implements them on the ground. They describe an event or sequence of events that are needed to modify the establishment, composition or growth of forest vegetation including trees, shrubs, grasses, and forbs. Whenever the desired future condition of the forest depends on the manipulation of forest vegetation, a silviculture prescription is prepared that describes the means for achieving the desired conditions. The purpose of this section is to monitor specific prescriptions to see if they meet objectives.

Of the sales and projects that are currently being implemented on the Forest, one commercial timber sale and one precommercial thinning project were monitored.

Helitower Timber Sale - The Helitower Timber Sale, located in the Woods LSR, was part of the Tower Timber Sale Environmental Assessment. The main management objectives for this sale were to accelerate the development of late-seral conditions in young stands less than 80 years old, and to restore structural complexity and biological diversity in riparian reserves where past wildfires and management activities have reduced diversity. Helitower was the helicopter portion of this decision and contained five units. A specific review was done on Helitower unit 32.

Helitower 32 is a 51-acre, 75 year old Douglas-fir stand averaging 16 inches in diameter with approximately 260 trees per acre, a basal area of 362 square feet and a canopy cover of 90 percent. The stand was initiated following the Cispus fire of 1918. There is a moderate amount of western hemlock and western redcedar in the understory of these stands. Portions of this stand were fertilized with nitrogen in 1986.

To meet the objectives of the decision, the prescription for this unit called for leaving approximately 98 trees per acre in the 8 inch and above size class. This is on average a 21-foot spacing with a residual 60 percent canopy cover.

The prescription also called for leaving 10 percent of the unit in unthinned patches ranging in size from ½ to 1 acre in size and 10 percent of the unit in openings ¼ to ½ acre in size. This equates to about 5 acres of gaps and 5 acres of no cut groups.

The prescription also called for no cutting of western hemlock, western red cedar, alder or big leaf maple.

The prescription calls for leaving 1308 lineal feet per acre of down wood.

Results: An average of 86 trees per acre was found during monitoring which is under what was expected by approximately 13 percent. This is approximate but it does appear that spacing on average was slightly wider than expected (a little over 22 feet vs. the 21 that was expected.). Canopy cover was lower than expected (47 percent vs. 60 percent).

There were six leave groups and five gaps created during the sale. Estimates made during monitoring suggest that while the number of gaps and leave groups was good, they both appear to be less than what was prescribed. With only five gaps at a maximum of ½ acre in size, it appeared that only 2.5 acres was left. With regard to leave groups, it appeared that to be within the range (4 acres rather than 5). All acreages were based on estimates.

The prescription called for no cutting of western hemlock, western red cedar, alder, big leaf maple or other incidental species. The cruise report did identify some western hemlock being cut. The conclusion was that the hemlock was probably cut during the creation of the gaps.

800 lineal feet of down wood was left versus a target of 1300 lineal feet due to the concern over the lowered residual canopy cover.

Recommended Actions: Variable density thinning with the objective of creating diversity in stands is very complex. The Forest needs to recognize ranges of acceptability rather than specific numbers. For example, there is no efficient way to accurately measure canopy cover to the nearest percent. Ranges of acceptability should be expected. Future prescriptions should reflect this range. In addition, it is important that the prescription identifies losses in canopy cover due to logging systems in addition to losses based on tree removal alone.

Assure that the prescription is followed and updated accordingly. If the prescription says to not cut a species and this is not possible to implement, the sale preparation staff should discuss with the silviculturist and the silviculturist should update the prescription accordingly.

Ruth Fire #4 Stocking Control - The Ruth Fire Unit #4 is a young stand about 15 years old. The species composition is 96 percent Douglas-fir, 2 percent Noble Fir, 2 percent western hemlock, and trace amounts of pacific



silver, western redcedar and red alder. The objectives of the decision for this project were:

- Leave 270 trees per acre following thinning.
- Maintain similar species diversity following thinning as prior to thinning.
- Develop horizontal and vertical landscape diversity
- Results:
- The project met these objectives

The prescription maintained uncommon species while thinning the more predominant species such as Douglas-fir. The objectives of the prescription were met.

Horizontal structural diversity was met by allowing 25 percent variability in an average spacing of 12 feet across the unit. This resulted in a range of spacing of 9 to 15 feet. Vertical diversity objectives were met by leaving the best tree and not always the tallest tree. Also trees less than 2 feet in height we not cut.

Recommendations: Continue to monitor these stands over time to determine the effects of treatment on variability. Forest Silviculturist will set up a protocol to monitor diversity in young stands.



Raptors Habitat for: Osprey, Swainson's Hawk, Goshawk, Ferruginous Hawk, and Great Blue Heron ^{35b} 😊

Introduction: The Forest Plan (page 2-75) provides standards and guidelines aimed at minimizing the disruption of habitat during critical nesting periods. Direction is also provided to minimize disturbance of key winter habitat. Species protected include: Bald Eagle, Peregrine Falcon, Golden Eagle, Osprey, Swainson's Hawk, Goshawk, Ferruginous Hawk, and Great Blue Heron

No projects were found to have the potential to affect these species.

Results: No proposed projects had the potential to affect these species or were implemented near known nest sites in 2004.

Recommended Action to be Taken: No action required; continue monitoring projects for disruption of habitat during critical nesting period.

Legacy Features ⁴⁰ 😐

Introduction: Residual green trees and dead wood in harvested areas function as a bridge between past and future forests. Green trees serve several important functions: they are available for snag recruitment, contribute to multistoried canopies, and provide shade.

Dead and partially dead trees or snags are important to certain wildlife species. To provide suitable habitat, a snag needs to be at least 17 inches in diameter and 40 feet high. They serve as breeding areas, shelter, and a host to insects, which provide food for birds. Species dependent on snags include the pileated woodpecker and several other woodpecker species, red-breasted sapsucker, red-breasted nuthatch, and northern flicker.

Ecological studies are expanding our understanding of the role of down woody material in forest ecosystems. Down logs are important because of their role in mineral cycling, nutrient mobilization, and moisture retention. In addition, down logs provide structure and habitat suitable to many wildlife species.

Results: The Helitower Commercial Thinning sale was monitored on the Cowlitz Valley Ranger District. Unit 32 was evaluated. Objectives for snag density were not yet met on this sale, and the area fell short of the desired level of down wood. The objectives included 2.6 snags per acre, and 1308 linear feet of down wood per acre. Less than one snag per acre and 800 linear feet of down wood per acre were documented. Snag creation is scheduled for 2005, and at that time the 2.6 snags per acre objective will be achieved. Additional trees were not felled because they were needed to meet the canopy cover for the unit. There is no specific standard and guideline for down wood for thinning units in Matrix except that the amount of down wood should reflect



the timing of the stand development cycles. The Helitower Commercial Thin was located in an LSR, which does have specific down wood guidelines.

The Middle Service Trail and Lewis River Trail Bridges were evaluated on the Mount Adams and Mt Saint Helens Districts. There was no effect on the snags in the project area. Unused wood was scattered.

Evaluation: While the Forest Plan does not contain a numeric standard for down wood or snags in thinnings, it is apparent that the down wood objective established through the Helitower Thinning EA was not met.

Safety takes precedence over standards and guidelines for snag retention. In situations where dead trees pose a risk to life and property, the hazard will be eliminated. In the case of the trail work, we conclude there was no effect on the snag or down wood component.

Invasive Species (Noxious Weeds) ⓘ

Introduction: Noxious weeds are a problem because they can be toxic to wildlife, domestic livestock, and humans and they displace desirable plant communities. Toxicity to flora and fauna is the primary concern because they are rarely ingested by people. Ecosystem changes produced by noxious weeds can be dramatic and have highly adverse impacts to plant and animal environments. These types of changes impact all resources.

Noxious weeds were treated on 110 acres and 2000 acres were monitored.

Results: Approximately, 2,000 acres were field reviewed across the Mount Adams and Mount St. Helens districts. One hundred and ten acres of Tansy Ragwort, Scotch Broom, five Knapweeds, and Hounds tongue species were treated manually and with biological controls. The treatment sites are within the Mount Adams Ranger District, Wind River Nursery, and Mount St. Helens Ranger District and National Volcanic Monument.

Recommended Action To Be Taken: Continue with the prevention measures, inventory of infestations, and aggressive treatment.



Grazing 45 ☺

Introduction: 2004 grazing monitoring of the Ice Caves Allotment was conducted by the Province Advisory Committee (PAC) as the Forest's and Southwest Washington Province's contribution to the Northwest Forest Plan implementation monitoring program (Figure 7). The following is adapted from the report of those monitoring activities.

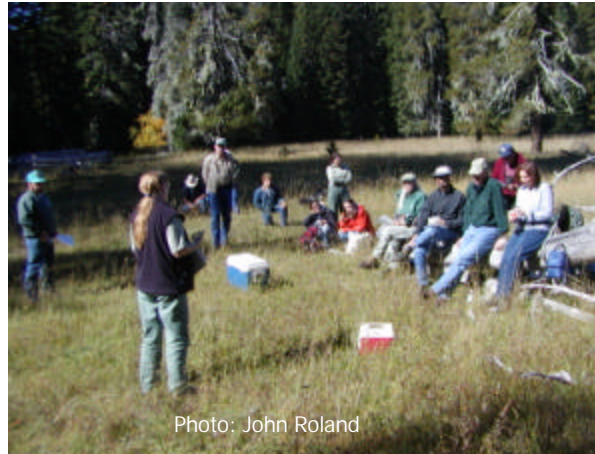


Photo: John Roland

Figure 7 - Lunch-time presentations at Peterson Prairie

The thirty thousand acre allotment is located in the Upper White Salmon River watershed, west of Trout Lake, Washington. Although the National Environmental Policy Act (NEPA) analysis for updating the allotment management plan was not complete, implementation of the existing management plan was monitored.

There are three areas of concentrated livestock use on the allotment. **Peterson Prairie** is a fenced pasture used as a holding area during fall round up. Peterson Prairie provides habitat for the mardon skipper butterfly (*Polites mardon*), which is state-listed and federally proposed for listing, and for pale blue-eyed grass (*Sisyrinchium sarmentosum*), a Regional Forester's Sensitive Species. **South Prairie** is an area favored by the cattle that also contains the pale blue-eyed grass. **Cave Creek** hosts both mardon skipper butterflies and pale blue-eyed grass, and is the site of a significant noxious weed infestation.

Livestock grazing has increased in meadow areas as transitory forage is reduced by growing conifers.

Under terms of the 2004 grazing permit, 200 head (cow/calf pairs) can be grazed from June 15 through September 30 on the allotment, which has been utilized by the same family for the past 50 years. The permittee grazed only 170 head in 2004. The previous permit was signed in September 1993 and expired in 2003. A 1995 Rescission Bill authorized extension of expired permits such as this one, and NEPA planning has been in progress over the past 2 years and is expected to be



completed in 2006. The complexity of issues and funding shortfalls have delayed completion of the allotment management plan.

Results: Peterson Prairie - According to District Range Staff, 2004 grazing standards (30% of current year's growth) in the pasture could support only 100 head of cattle for approximately 3½ days.

Maintaining our natural meadow systems will require active management by the Forest Service (Figure 8). According to the grazing permit holder the structure of the forest changed in the past 50 years, saying dense stands were once open ponderosa pines. The Permittee was also concerned that other Forest users are complicating herd management in the allotment.



Photo: John Roland

Figure 8 - A PAC Member commenting on forage utilization

Part of the issue related to grazing on the Ice Caves Allotment is effects to the mardon skipper butterfly. The mardon skipper is a Federal Candidate Species (for the Threatened and Endangered Species list) and was listed in 1999 by the State of Washington as an endangered species. The effects of grazing on the skipper are unconfirmed but there is concern that grazing interferes with the reproduction phase of their life cycle.

South Prairie - South Prairie is a natural meadow complex favored by cattle on the allotment. Unlike most meadows on the Mt. Adams District, the prairie's open nature is maintained primarily by the hydrology of the area. During late fall, winter and early spring, much of South Prairie is a shallow lake. The water drains through lava tubes in late spring, leaving the meadows open and dry.

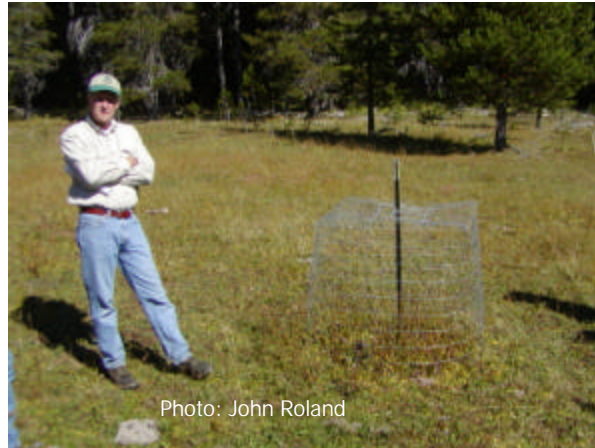


Photo: John Roland

Figure 9 - District employee explains cage exclosures

South Prairie provides important habitat for pale blue-eyed grass, and contains the largest and most genetically diverse population of the species. Pale blue-eyed grass is a narrowly endemic species, found only in southwest Washington and northwest Oregon. There is concern that livestock utilization exceeds that which is healthy for the species. Livestock grazing has increased in meadow areas as transitory forage created by past timber harvest is reduced by growing conifers. In response to heavy grazing of South Prairie in 2003, Forest Service and the permittee agreed to reduce the demands on South Prairie by moving 75 cow/calf pairs to the vacant, adjacent Twin Buttes allotment.



Photo: John Roland

Figure 10 - Forest employees discuss the source of sediment in South Prairie

The District monitored forage production in the allotment using 44 cage exclosures (Figure 9) scattered in meadows, transitory range, and mature forest. Utilization in 2004 was estimated to be 23 percent on August 3, 26 percent on September 8, and 15 percent on September 22. Re-growth from mid-summer rains affected the utilization projection. Plots taken in mid-October indicated a utilization of 47 percent. The grazing permit utilization standard for such riparian areas is 30 percent or less. A portion of the pale blue-eyed grass population was able to set seed this year.



Figure 11 - Localized grazing impact to Lost Creek riparian area

Sediment deposition on South Prairie (Figure 10). comes from a variety of sources – both natural and management influenced – which may include channel and bank erosion along Lost Creek and its tributaries, mass wasting, and sediment from the road system upstream. 2003 stream surveys found riparian and stream bank damage caused by cattle grazing. Some streams experienced stream bank sloughing and riparian vegetation removal by cattle. These include: Lost Creek (Figure 11), South Prairie Lake South Tributary, South Prairie Lake East Tributary, and Cave Creek. The District will be closely monitoring these areas in the future.

Cave Creek - Cave Creek is an area managed with an emphasis for wildlife under the Forest Plan. An 80-acre exclosure was constructed in the early 1990's to protect beaver and waterfowl habitat from grazing. The area is also the site of the second largest known population of pale blue-eyed grass. A 5-year study on the effects of grazing on pale blue-eyed grass compared plants within and outside the exclosure. It was determined that grazing was preventing the plant from producing seed.



Figure 12 - District Botanist explains houndstongue infestation at Cave Creek

Cave Creek is the site of a large noxious weed infestation, including populations of Canada thistle, tansy ragwort and houndstongue (Figure 12).



The latter two are toxic to cattle. The area has been identified as an “emphasis area” in the Regional Invasive Species Environmental Impact Statement. The thistle population likely originated from logging and, because of the presence of pale blue-eyed grass and restrictions on use of herbicides, has been difficult to treat. County managers recently cut flowers off thistle plants in the area as a means of reducing the seed crop. Based on observations inside and outside the enclosure, it appears that cattle grazing may inhibit thistle vigor and spread.

The area has the only known population of houndstongue on the Forest, which may be associated with livestock grazing. Because the seeds readily attach to a cow’s hide, it is very prone to spread by cattle.

Management of the Ice Caves Allotment appears to comply with NWFP standards and guidelines. The Ice Caves Environmental Analysis will update the allotment management plan and may amend the Gifford Pinchot Forest Plan.

Recommended Action To Be Taken: With the reduction in transitory range as old harvest units become forested, the Forest will evaluate grazing capacity as part of the Ice Caves Grazing Allotment. The timing of grazing is as important as the number of animals. The Forest should confirm that cattle are not put on the allotment too early in the spring, particularly in the area of South Prairie, which may remain wet late into June in some years. It may be necessary to fence cattle out of the Cave Creek area to stop the spread of houndstongue.

The complexity of issues and funding shortfalls have delayed completion of the allotment management plan.

The Forest needs to adopt and consistently apply a scientifically sound protocol for monitoring range utilization. The Forest will ensure that grazing is consistent with Aquatic Conservation Objectives. Areas needing special attention include Cave and Lost Creek riparian areas, tributaries to South Prairie Pond, and the Lost Creek diversion. The Forest should consider the use of a biological control of Canadian thistle, such as a beetle (*Rhncocyllus conicus*) that has been successful in reducing populations in other areas.



Research Natural Areas 5 ☺

Introduction: The Forest Plan forbids any activity within a Research Natural Area (RNA) that would adversely affect the natural values for which the RNA was established. Prohibited activities include livestock grazing; timber and miscellaneous forest products harvest; recreation development and use; road construction; temporary facility installation; unlawful mining or mining of common variety materials; establishment of exotic plant, animal, or insect species; and establishment of non-endemic levels of insects, pathogens, or disease.

The Forest Plan forbids any activity within an RNA that would adversely affect the natural values for which it was established.

The seven areas designated as RNAs through the planning process are listed in Table 9. These areas provide representative examples of biologically important ecosystems and are managed to conserve their biological diversity. They serve as undisturbed controls for comparison with managed areas and are valuable for studying natural processes. Research Natural Areas are permanently protected federally designated reserves where long-term studies that contribute to our knowledge of the ecosystem are encouraged. The standards and guidelines for Research Natural Areas focus on maintaining their natural state for research and education. These standards and guidelines also apply to three proposed RNAs until they are evaluated for RNA designation. Monitoring serves to evaluate whether the natural conditions of the Research Natural Area have been modified, and prescribes corrective actions if necessary.

Table 9 - Research Natural Area Monitoring

Research Natural Area	Last Monitored	Standards & Guidelines Met?
Butter Creek	2003	yes
Goat Marsh	2003	yes
Sisters Rock	2004	yes
Steamboat Mountain	2004	yes
Cedar Flats	2000	yes
Thornton T. Munger	2004	yes
Monte Cristo	2000	yes
Proposed Smith Butte	2001	yes

Results: In FY 2004 TT Munger, Sisters Rocks RNA, and Steamboat Mountain RNA were monitored. RNA standards and guidelines were met in general, though there are concerns about adequate signing and encroachment by invasive species.

The **TT Munger** RNA field visit encompassed the southern portion of the RNA, sections 20 and 21, and included the boundary with the old Wind River Nursery fields, Trail 199 from the Canopy Crane to Forest Service Road 43, and wetlands in the NE corner of section 21. The northern portion of the RNA was reviewed in 2003.



Noxious weeds are present and common along Road 43 in the Wind River Nursery fields and on the margins of beaver-impounded wetlands in the eastern extent of the RNA (Figure 13). The infestation encompassed a relatively small area around the dam, and could be controlled if treated soon, and continuously, to avoid their further incursion into the RNA. Species present included: Canada thistle (*Cirsium arvense*), cats ear (*Hypochaeris radicata*), St. Johnwort (*Hypericum perforatum*) and reed canarygrass (*Phalaris arundinacea*).



Figure 13 - Wetland and beaver pond habitat in eastern portion of the TT Munger RNA where several weeds were found

Conditions regarding Road 43 and the nursery fields appeared to have remained the same as reported in previous years. A small patch of scotchbroom (*Cytisus scoparius*) persists along the cyclone fence near the entrance to the Canopy Crane. This should be a high priority for eradication.

The Wind River Nursery has had an active, ongoing weed treatment program for years. However, the site is optimal for their propagation and they persist in abundance.

TT Munger, Sisters Rock and Steamboat Mountain RNAs were monitored. Standards and guidelines were met.

Many of the boundary signs along Trail 199 were hanging by a single nail, and others had fallen to the ground.

The **Sisters Rock** RNA field visit included the central portion of Sisters Rock RNA along and to both sides of Trail 132, and along the ridge out to Sister Rocks. The section of Forest Service Road 58 on the northern boundary of the RNA and the trailhead parking area for Trail 132 were also reviewed.

The **Steamboat Mountain** RNA field visit included the boundary along Road 8854 and Road 8854021, Steamboat Mountain Trail 14 and its trailhead



parking area, the ridgelines running to the northwest and north of the summit, and the intervening valley with its small pond and meadow. This visit primarily encompassed the northeastern section of the RNA.

Swell Timber Sale Unit 1 is located adjacent to the western boundary and southwestern corner of the RNA. This unit follows along portions of Road 8861 and 8854, opposite the RNA boundary for about 0.7 miles. The unit is 81 acres in size. Harvesting of this unit will create suitable habitat for noxious weeds. Its proximity to the RNA provides an avenue for weeds those weeds to spread the wetland along the western boundary of the RNA.

A gravel stockpile site is in current use on the RNA (north) side of Road 8854. This site has the potential to become a source for noxious weeds. No weeds were observed during the monitoring.

A large quarry and rock stockpile area is located at the end of Road 8854021 at the base of Steamboat Mountain (Figure 14). This site is adjacent to the RNA and is approximately 10 acres in size. Rock was extracted from the talus slope and cliff directly beneath the summit. It has the potential to become weedy.



Figure 14 - Quarry and gravel stockpile area at base of Steamboat Mountain, 2002

About two-thirds or more of the RNA boundary is bordered by roads. Noxious weeds are present on these roads and vary from mostly light to moderate concentrations, with a few heavier patches, mostly of tansy ragwort (*Senecio jacobaea*) and St. Johnswort (*Hypericum perforatum*). Other weed species included Canada thistle (*Cirsium arvense*), bull thistle (*C. vulgare*) and cats ear (*Hypochaeris radicata*). Roads adjoining young plantations had the most weeded sites, and pose the greatest threats for introducing weeds into the RNA. The most infested roads included Roads 8871095 and 8854021. Other roads sustaining weeds were 8861, 8854 and 8871.



Steamboat Mountain Trail 14 is the only official trail in the RNA. This relatively short trail leads from the quarry to the summit of Steamboat Mountain. The trail was in good condition and appeared to receive light to moderate use. The trail is maintained in good condition. The viewpoint at the summit is trampled to bare ground over a small area. These impacts are probably not affecting the purposes of the RNA at this time.



Figure 15 - Pond/meadow complex at head of Poison, where Cat's ear (*Hypochaeris radicata*) was found in 2004

The finding of cat's ear (*Hypochaeris radicata*) in the pond/wetland complex on the northern side of Steamboat Mountain (Figure 15) is the first documented occurrence of a noxious weed in the Steamboat Mountain RNA. This represents an increasing trend.

Recommended Action To Be Taken: Posting of "RNA," "No Camping" and "No Mushroom Collecting" signs is needed in TT Munger RNA. Monitor invasive species in and adjacent to TT Munger and Steamboat Mountain RNAs.

No recent management activities are planned or have recently occurred near the TT Munger RNA. Boundary signing needs to be re-established.

The greatest threat to Steamboat Mountain RNA is weed introduction from roadside sources, particularly to wetland and meadow areas. Treatment activities should be a high priority. Clean up of the "squatters" camp should be a high priority. Close Road 8871095 that accesses the northern boundary of the RNA. There is no recommended action for the Sister Rocks RNA.



Fish/Riparian S&G Implementation 62a ☺

Introduction: The Forest Plan outlines specific standards and guidelines to ensure protection of fish and riparian resources. The emphasis of this monitoring item was to determine whether fish and riparian standards and guidelines were implemented through project planning and implementation. This monitoring item was evaluated at the project-level. Specific questions addressed were:

- What riparian mitigation was planned for the project?
- Was planned mitigation consistent with standards and guidelines?
- Was the project contract written to include provisions to meet standards and guidelines?
- Was the project implemented in compliance with standards and guidelines?

A variety of project types (i.e., timber sale, road construction, recreation development, watershed restoration, etc.) may be evaluated under this monitoring item. For 2004, one recreation project and one Timber sale were the focus under this monitoring item. Cowlitz Valley Ranger District monitored Helitower Timber Sale, and Mount Adams Ranger District monitored Middle/Service Trail Reconstruction project (Table 10). The same projects were evaluated under *Effectiveness of Riparian Standards and Guidelines* on page 42. Projects were implemented in 2004 and were planned under the 1994 *Northwest Forest Plan*.

Table 10 - Projects Monitored in 2004 for Fish/Riparian S&G Implementation on Gifford Pinchot National Forest

Ranger District	Project Name	Timber Sale Unit/Area	Planning Year	
			990 ¹	1994 ²
Cowlitz Valley	Helitower	32	√	√
Mount Adams	Middle/Service Trail Reconstruction	n/a		√

¹ Project planned under 1990 Gifford Pinchot National Forest Plan.
² Project planned under 1994 Northwest Forest Plan.



Results:

Riparian Mitigation Planned

All of the projects employed mitigation measures to protect riparian resources. Riparian mitigations for the timber sales were developed during the project planning process as part of required environmental analysis. Mitigations included:

- Establishment of riparian buffers along streams and wet areas.
- Designation of streams on sale area maps.
- Directional tree felling away from riparian reserves.
- Felled trees should be yarded away from streams.
- No landings or temporary roads located within riparian reserves.
- Stream crossings (road reconstruction) would follow management guidelines in the Memorandum of Understanding with Washington Department of Fish and Wildlife.

Helitower Timber Sale

Riparian Reserve management recommendations were derived from the April 1996 Watershed Analysis for the Lower Cispus East Watershed. Watershed Analysis found that restoring riparian function and late-successional forest connectivity in parts of the watershed were needed to attain Aquatic Conservation Strategy objectives as described in the Northwest Forest Plan. The analysis recommended thinning within the riparian reserves when silvicultural objectives are specifically designed to improve the aquatic conditions or develop late structural corridors (see page 7-16 of the watershed analysis). Therefore, areas within Riparian Reserves were included for harvest in this proposal.

Forest Plan standards and guidelines provide interim riparian protection within one site-potential tree height for non-fish bearing streams and wetlands. The sale planning process modified interim buffers to benefit the structural development by prescribing Riparian Reserves treatment as follows:

- The inner 75 feet from the stream channel as a no-cut buffer and,
- The outer 75 feet (75 feet to 170 feet from the channel) thinned to a density where canopy closure remains above 60%.

Middle/Service Trail Reconstruction

Riparian mitigation planned for the Middle/Service Trail reconstruction included placing soils away from the stream, minimizing riparian vegetation disturbance, no heavy equipment in streams, no trees cut within 50' of streams, armoring crossing 11 with large material, realigning trail approach at crossing #11, obscuring the former trail approach at crossings #11 and #21, and moving the trail away from the stream.



Planned Mitigation Consistent with Standards and Guidelines?

In all cases, planned riparian mitigation measures were consistent with Forest Plan Standards and Guidelines.

Contracts Written to Include Necessary Provisions?

In all cases, the contracts were written to reflect the planned riparian mitigation. They included erosion control requirements, directional felling, and specific yarding requirements.

Were Projects Implemented in Compliance With Standards and Guidelines?

The implementation of Helitower Timber Sale did not entirely comply with the Standards and Guidelines. Average canopy cover for the outer zone of the riparian buffer fell below the prescribed 60%. The Middle/Service Trail Reconstruction project had not been fully implemented. The majority of prescribed mitigations were implemented as written with the exception of one trail stream crossing approach that was not realigned. See Monitoring Item #61a for photos and further description.

Implementation of Helitower did not entirely comply with the S&Gs.

Evaluation: The Helitower unit did not comply with fish and riparian standards and guidelines. Appropriate mitigation measures were identified in the planning process and were subsequently tracked through contracting process. However, mitigations were not fully implemented on the ground. Tracking mitigation measures is largely the responsibility of the Forest Service Contract Officer Representative.

At this time, it is not known whether all mitigation measures have met their desired objectives because only one unit in Helitower was monitored and the Middle/Service Trail Reconstruction project has been partially implemented. It is important to recognize that the objectives of treatment (restore connectivity, develop riparian stand structure, etc.) are long term and the outcome will not be realized for several decades. No observable or direct impacts to fish and riparian resources were documented by the Fisheries Biologist, Hydrologist, or soil scientist staff members conducting these evaluations; however, canopy cover <60% in riparian stands is noted.

2004 monitoring indicates the Forest has made a transition to the 1994 Forest Plan standards and guidelines. Because all projects evaluated were planned under the 1994 Northwest Forest Plan, there seemed to be far less confusion than previous years when projects were planned under the 1990 Forest Plan and monitored against the 1994 Northwest Forest Plan. However, the quality of information related monitoring results has decreased, making it difficult to discern adequate interpretation of data results.

Recommended Actions to be Taken: Successful planning and implementation would be attributed to several factors.

Continue to have a fish biologist, hydrologist, and soil scientist participate in locating and classifying streams and wet areas prior to completion of the

timber sale contract (preferably during preparation of the environmental analysis) and when hazard trees have been identified within administrative and recreation sites, and along Forest Service roads.

Specify riparian mitigations in environmental assessments and contracts for streams and wet areas.

Continue to provide necessary training for timber sale layout and marking personnel to ensure that all streams and wet areas are properly identified and treated in accordance with specified mitigations.

Thorough ground surveys should be extended outside the immediate planning area boundary a distance of two site-potential tree-heights. This precautionary measure helps ensure that all adjacent streams and wet areas are treated appropriately.

Projects implemented with a rental agreement contract should be actively administered by a contracting officer's representative (COR) to ensure the successful implementation of planned mitigation.

Reconsider the felling of hazard trees within riparian areas into streams, if the project fish biologist and hydrologist agree.

Review monitoring results for adequate data interpretation and provide maps of units showing Riparian Reserve buffers (suggest using ortho quads).



Effectiveness of Riparian Standards and Guidelines 62b 

Introduction: The intent of this monitoring item is to determine if planned mitigations are effectively meeting Forest Plan management objectives for protection of riparian, fish, and water resources. The same projects investigated under *Fish/Riparian S&G Implementation* (Table 10, page 38) are evaluated here. Three specific questions shall be answered for all projects monitored for *Effectiveness of Riparian Standards and Guidelines*:

1. Is channel stability maintained?
2. Is stream shading maintained?
3. Are sediments originating from management activities reaching the stream course?

Helitower Timber sale

For assessing channel stability, stream shading, and sediment delivery from management activities related to Helitower Timber sale, Trapper Creek and an unnamed tributary to Greenhorn Creek were evaluated for purposes of this monitoring report. Evaluations took place within the boundaries of Helitower sale unit #32, also known as Tower 20b sale unit. The sale planning process modified interim NWFP buffers to benefit the riparian structural development by prescribing Riparian Reserves treatment as follows:

- The first inner 75 feet from the stream channel as a no-cut buffer and,
- The next outer 75 feet (from 75 feet to 170 feet) thinned to a density where canopy closure remains above 60%.

Middle/Service Trail Reconstruction

Smokey, Cultus, and Meadow Creeks were evaluated for sediment delivery from the Middle/Service Trail Reconstruction project.

Results:

Maintenance of Channel Stability

Channel stability was maintained inside of Helitower sale unit #32 because there was no evidence of channel instability related to Helitower Timber sale. A no-harvest buffer of trees along the banks of all stream channels was implemented.

Maintenance of Stream Shading

The stream shade objective for Helitower Timber sale was not fully met in the outer riparian zone. A no harvest buffer was maintained at ½ site potential tree height or 75 feet from class III and IV streams. However, canopy cover in the outer riparian reserve (ranging from 75- 150 feet from the stream course) was expected to be maintained above 60% canopy closure. Based on post harvest canopy cover measurements in the outer riparian reserve an average canopy closure of 47 % was left and therefore the unit was deficient in meeting 60%

canopy closure. There is no water temperature data for streams directly within the harvest unit; however, below the harvest unit, the baseline water temperature monitoring indicates that Greenhorn Creek commonly exceeds 16⁰ C. and does not meet the state water temperature standard. In 2004 the maximum 7 day average high stream temperature was measured at 18.8⁰ C.

Sediment Transport to Affected Stream Course

No sediment was found to be reaching the stream course within the harvest unit boundary because of the thinning activities. However, sediment is being generated from connected actions related to the Helitower timber sale, including the following:

1. Immediately downstream of unit 32 there is a plugged culvert located on the designated haul route (Forest Road 7605024) with water overtopping the road prism;
2. Vehicular traffic from non-commercial firewood cutting of piled unmerchantable material is causing sediment to reach the stream course. A proposal to address these sediment sources is proposed in an amendment to the KV plan (Mod 3. Nov 2004).

Some sediment from the Middle/Service Trail Reconstruction project has reached a stream. The magnitude of sediment reaching the stream from the trail reconstruction activities appears to be low. This project is not yet fully implemented, hence follow-up monitoring should be conducted at project completion.

Evaluation: Riparian standards and guidelines were effective in meeting Forest Plan management objectives for protection of riparian, fish, and water resources. There was no evidence of channel instability related to the Helitower timber sale project. However, there was evidence of some sediment being delivered to a stream because of the Middle/Service Trail Reconstruction project. Because the trail reconstruction project is not fully implemented, additional monitoring should be conducted.

The Helitower Timber sale project team found no roads or skid trails across stream channels. Although canopy cover in the outer riparian reserve of sale unit #32 was less than 60%, the team was unable to measure decreases in stream shading because no pre-activity readings were taken. Natural shade conditions in the inner 75-foot no-cut buffer appear to adequately shade any direct solar radiation. The stream course within the unit boundary is steeply incised and subject to topographic shading.

Helicopter yarding and log haul activities resulted in limited areas of ground disturbance. Consequently, there was no evidence of soil movement within the unit boundary and no sediment is expected to make it to area streams. Abundant ground vegetation and limb litter are contributing factors that prevent current and future contribution of sediment to the area streams.



Recommended Action to be Taken:

- Continue monitoring until objectives have been met.
- Revise format to incorporate non-traditional projects (e.g. restoration projects, recreation sites)
- Define some quantifiable numerical standards for restoration monitoring.
- Examine alternative sources of standards (e.g. PIG, NMFS environmental baseline matrix, or Forest-wide health assessment) for evaluating restoration project effectiveness.
- Establish a provincial source of standards that better represent potential conditions on the Forest rather than a general standard such as those in the NMFS environmental baseline matrix.
- Hazard Tree Removal and other similar projects need to pay close attention to the decompaction of roads, skid trails, and waterbar construction.



Proposed, Endangered, Threatened, and Sensitive (PETS) Fish Species ^{62c} ⓘ

Introduction: The list of PETS fish species occurring on Gifford Pinchot National Forest (GPNF) includes seven threatened, sensitive, and candidate fish species, and one proposed critical habitat. These species include:

Table 11 - Proposed, Endangered, Threatened, and Sensitive (PETS) Fish Species

Status	ESU (Evolutionary Significant Unit) or DPS (Distinct Population Segment) and Regional Forester's Sensitive Species
Threatened	Columbia River bull trout (<i>Salvelinus confluentus</i>)
Threatened	Lower Columbia River and Middle Columbia River steelhead trout (<i>Oncorhynchus mykiss</i>)
Threatened	Lower Columbia River and Puget Sound Chinook (<i>Oncorhynchus tshawytscha</i>)
Proposed	Critical Habitat for Coastal Puget Sound Bull Trout
Proposed	Lower Columbia River/Southwest Washington Coho (<i>Oncorhynchus kisutch</i>)
Sensitive	Interior Red Band Trout
Sensitive	Pygmy Whitefish

The U.S. Forest Service (USFS) sensitive species policy requires that species, populations, Evolutionarily Significant Unit (ESU), or Distinct Population Segments (DPS) with viability concerns or trending toward Federal listing, be given special management emphasis to ensure their continued existence. Part of this special emphasis is the development of careful monitoring plans through partnerships to assess and document local fish population and habitat conditions following the implementation of ongoing and proposed activities on national forest land. The following is a discussion of different monitoring tools used to assess fish and habitat conditions for two listed species on the Forest.

Forest Service sensitive species policy requires that species with viability concerns be given special management emphasis to ensure their continued existence.

The majority of the monitoring program in the Forest's fisheries program is accomplished through the development of outside partners, such as Washington Dept. Fish and Wildlife (WDFW). This year's monitoring efforts continue to emphasize adult steelhead counts for the Wind and East Fork Lewis Rivers by conducting snorkel survey counts on index reaches, monitoring two adult steelhead traps, operating smolt traps and conducting redd surveys. Only results from snorkel surveys are discussed below. Snorkel surveys for adult steelhead population data is organized and led by WDFW.



While data provided here are insufficient to determine population viability, these data do provide useful information on population trends.

Steelhead (*Oncorhynchus mykiss*)

The Lower Columbia River Steelhead ESU is federally listed as Threatened by the National Marine Fisheries Service under the Endangered Species Act. The steelhead is an anadromous form of rainbow trout that inhabits several rivers and streams throughout GPNF. Adult steelhead spawn in rivers and streams by laying their eggs in depressions in the gravel called "redds". Fry emerge from the gravel and rear for one to three years in freshwater before migrating to the ocean as smolts where they grow to adults. The number of fish present may serve as an indicator of stream health. However, many factors other than habitat quality influence the population size and structure of anadromous fish such as angling, hydroelectric facilities, ocean conditions, avian and marine mammal predation, and hatchery introductions.

Results:

Wind River Steelhead Snorkel Survey - The Wind River was snorkeled on August 13 and 14, 2004 by personnel from WDFW, US Forest Service (USFS), US Geologic Survey -Biological Resources Division (USGS-BRD), US Fish and Wildlife Service (USFWS), Yakima Indian Nation (YIN) and several volunteers. Objectives for the Wind River steelhead snorkel survey were to obtain a count of steelhead for trend comparison with the past 15 years' results, and to provide mark/observation data for estimating the actual number of steelhead in Wind River. The snorkel survey covered 20 miles of main stem Wind River. This data provides resource managers with another outstanding piece of information on adult steelhead. The total estimated wild steelhead count in 2004 was 143 (Figure 16). The estimated wild count of 143 is the fifth highest since 1988. The two highest counts are 274 in 1988 and 233 in 2002. It is also 2.7 times larger than the 10-year average for this index. It is the highest return since 1988, which had a count of 252 (Rawding, WDFW pers. Communication).

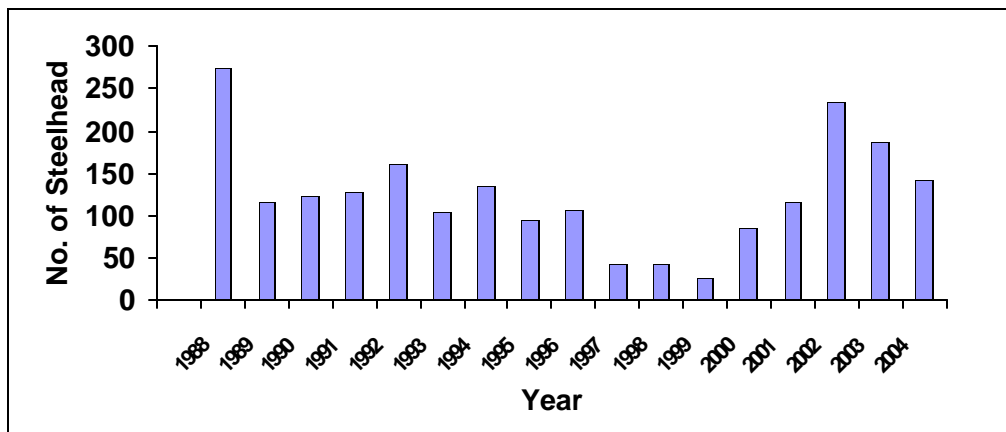


Figure 16 - Wind River adult steelhead snorkel survey index counts from 1988 to 2004



Although there was an increase in the Wind River steelhead population in 2002, biologists are very concerned about the long-term viability of this population. The current population is less than one-quarter of state escapement goals (1000 adults). The snorkeling results help the WDFW biologists make critical fishing regulation changes each year and serve as a monitoring tool for restoration efforts completed on National Forest lands.

East Fork Lewis Steelhead Snorkel Survey - For the past ten years, WDFW in cooperation with Clark-Skamania Flyfishers, Trout Unlimited, US Fish and Wildlife Service (USFWS), and USFS biologists has organized a snorkel survey along the East Fork Lewis River. The objective of the survey is to count adult summer-run steelhead. Snorkel counts are completed in mid-summer on an average of 30 miles of main stem and tributaries. Steelhead are counted as wild, hatchery, and unknown. In 2004, EF Lewis River snorkel survey was conducted on July 9 and 10, 2004. Surveys were conducted from the main stem of EF Lewis River from Sunset Falls (RM 32.7) to Daybreak Park (RM 10.2).

The 2004 total adjusted counts were 326 hatchery, and 289 wild steelhead. The total wild steelhead count of 289 fish is the second highest total since the survey was initiated in 1995 (Figure 17). The highest total was in 2002 with an adjusted wild count of 393 adult steelhead. The total (adjusted) hatchery steelhead count of 326 fish is the highest total since the survey was begun, and represents a 45% increase from 225 in 2002 (previous highest total), and a 110% increase from last year's count of 155. In 2004, wild steelhead accounted for 47% of the steelhead observed.

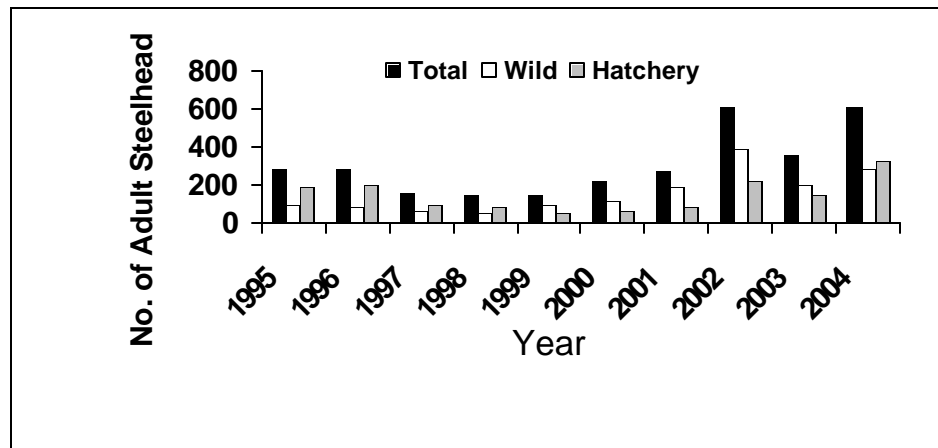


Figure 17 - East Fork Lewis River adjusted steelhead snorkel counts from 1995 to 2004

The above numbers do not represent the total number of steelhead in East Fork Lewis River. Steelhead will enter the river after the surveys and some fish hiding in whitewater, large woody debris, boulders, and deep pools are not observed during the surveys. The numbers represent a relative value that is used as an index to compare trends between years.



Evaluation:

Population Viability and Influencing Factors - Many factors in addition to habitat are known to affect anadromous fish populations. Global weather patterns, specifically the drought years from the late 1980s through 1993, have exacerbated the effect of declining habitat conditions. Sport and commercial fishing have also taken their toll. Continued harvest of depressed stocks further contributes to their decline. The Wind River steelhead population continues to show a declining trend over the 10-year record of surveys. Losses of riparian vegetation, altered streamflow and sediment regimes have reduced the ability of the watershed to reach its full potential in supporting aquatic life. Impacts are manifested by increased water temperatures, reduced pool quality and abundance, reduced woody debris in streams, and increased stream width-to-depth ratios (*Wind River Watershed Analysis, 2002*).

At this time, ocean survival appears to be the major factor of decline of steelhead within the Wind River basin. Based on smolt trap, snorkel and redd survey data, smolt to adult survival for the past four years has been below 1%. Seven to twenty percent was considered good to excellent smolt to adult steelhead survival in Washington rivers such as the Kalama River and Snow Creek (Rawding, personal communication). Freshwater survival has been good to excellent in recent years. Adult returns and subsequent low numbers of juveniles reduce direct and indirect competition that promotes higher survival. In addition, the relatively good freshwater conditions are evidenced by the number of days >16 degrees Celsius (60.8 degrees Fahrenheit) each cohort has had to endure has declined in the last four years by >30%. However, the decline of the Wind River steelhead began during the drought in the late 1980's to early 1990's. During that period the loss of riparian vegetation, altered stream flow, and sediment regimes due to timber harvest reduced the ability of the watershed to support aquatic life. Impacts were manifested by increased water temperatures (>25degrees Celsius, or >77 degrees Fahrenheit), reduced pool quality and abundance, reduced woody debris in streams, and increased stream width to depth ratios (*Wind River Watershed Analysis, 2002*). Poor freshwater conditions then followed by poor ocean conditions has put this and other stocks of salmonids within the basin in a perilous state.

The impact of dams, Hemlock Dam on Trout Creek and the Bonneville Dam on the main stem Columbia River, has not been quantified to an acceptable level of confidence. It is thought that 10-15% of smolts out-migrating on the Columbia River are direct and indirect casualties of Bonneville Dam (Dan Rawding, Lower Columbia Steelhead Biologist for WA Dept of Fish and Wildlife, personal communication). Global weather patterns, specifically drought years in the late 1980's through the summer of 1993, have amplified the impact of these problems on fish populations (*Wind River Watershed Analysis, 2002*). Sport and commercial fishing have also taken their toll. The reluctance of management agencies and beneficiaries of the Columbia River salmon runs to reduce their harvest despite dwindling populations has resulted in a higher percentage of the runs being harvested. Based on smolt to adult

survival estimates, approximately 99% of all steelhead out-migrating from the Wind River as smolts are lost to dams, harvest, disease and predators.

Water temperatures in the system historically exceeded Washington state water quality standards (1977-1995) and were recorded above lethal limits on a widespread basis in the watershed in 1992. Increased precipitation beginning in the Winter of 1993 has continued through 1997, which has resulted in better stream flows, although temperatures have consistently exceeded the state water quality standard (Watershed Analysis, 1996). The upward trend in smolt production from 1995-1997 is probably due in a large part to reduced water temperatures and increased stream carrying capacity resulting from higher stream flows during summer months.

The Forest Service is currently pursuing an aggressive watershed and habitat restoration effort in priority watersheds. Substantial restoration work has been accomplished in the Wind River Watershed (1994 to present), and habitat improvements are planned for implementation on Forest Service lands within the next 5 years.

Recommended Action to be Taken:

- Continue watershed restoration partnership efforts aimed at steelhead recovery.
- Promote the development of a watershed restoration partnership recovery approach for steelhead in each priority watershed.
- Implement planned watershed and habitat restoration identified in watershed analysis for priority watersheds.
- Monitor and develop a report on restoration results.
- Continue to develop mark recapture estimates for steelhead adults and smolts on the Wind River.
- Develop a biological monitoring plan (e.g. adult escapement and freshwater survival) for priority watersheds.
- Develop active partnerships and actively pursue salmon recovery initiative funding to continue restoration and monitoring efforts in priority watersheds.

Bull Trout (*Salvelinus confluentus*)

Introduction: Bull trout in the Lower Columbia River Distinct Population Segment (DSP) are listed as threatened under the Endangered Species Act by USFWS. Since juvenile bull trout require exceptionally cool, clean water, they are considered a good management indicator of watershed condition and aquatic ecosystem health. A verified population exists in the North Fork Lewis River system above Merwin Dam, with the majority of fish occurring above Swift Dam. Preliminary information suggests that the Kalama River and Yellow Jacket Creek may have an existing or historic bull trout population. However, no verifiable evidence exists. The Lewis River population is considered adfluvial while the life history of the other two populations is



unknown. Adults spend the majority of their life cycle in Swift Reservoir, ascending its tributaries each year to spawn.

Bull trout population monitoring has been conducted in partnership with the WDFW and PacifiCorp since the early 1990's. In 2001, GPNF contracted Clearwater BioStudies Inc. to do night bull trout snorkel surveys and conduct water temperature monitoring in specific watersheds in addition to the WDFW and PacifiCorp survey efforts.

North Fork Lewis River. Early monitoring efforts with WDFW focused on determining population size and viability through collection of catch per unit effort data. Beginning in 1994, population estimates were derived using a mark-visual observation method. Adults are captured in the reservoir in the spring, uniquely marked, and then released. In the late summer and early fall, repeated snorkel surveys are used on a weekly basis to observe the ratio of marked to unmarked adults active on spawning grounds. Using a Joint Hypergeometric Maximum Likelihood Estimator (JHE), a population estimate is calculated along with a 95% confidence limit.

Two conditions are modeled in deriving the JHE. They include the following:

1. A 10 percent reduction in the number of reservoir marked adults appearing on the spawning grounds (based on prior year radio telemetry studies), and
2. A 10 percent tag loss.

PacifiCorp, Trout Unlimited, WDFW, and USFS personnel conducted snorkel counts in two streams where bull trout spawn to count the number of tagged and untagged bull trout; Pine and Rush Creeks. The resulting data is used to estimate bull trout population size each year.

The objective of this multi-year partnership is to collect information about bull trout migration timing, distribution, habitat use, and habitat preferences so we can develop site-specific recovery plans for the species. We captured one hundred and twenty-six adult fish at the reservoir headwaters during May 2001 with short-term gill net sets. Out of the one hundred and twenty-six fish caught, only eighty-eight were tagged. Fish were marked with a floy tag (tags that look like a colorful 2" piece of spaghetti) and released back into the reservoir. We also discovered that the 1996 flood changed the spawning time of fish in the North Fork Lewis River – for unknown reasons, spawning now occurs 2 to 3 weeks earlier than before the floods.

Bull Trout Surveys. Since the listing of bull trout, GPNF, WDFW, and USFWS have been discussing the likelihood of the species' presence in several drainages on national forest system land. Discussions revolved around known fish distributions and habitat conditions, such as water temperature, stream surveys, snorkel surveys, creel samples, electro fishing surveys, and anecdotal information. Further review and close examination of various types of historical and current survey records excluded the presence of bull trout in several drainages. In others, poor quality and lack of data could not verify the absence of bull trout or potential bull trout habitat.



Clearwater BioStudies Inc. was contracted to conduct bull trout presence-absence surveys and associated stream temperature monitoring on the GPNF. This information will assist in acquiring more data to determine the likelihood of bull trout presence.

The objective of bull trout surveys completed in the year 2001 using the Interim Protocol for Determining Bull Trout Presence where possible on GPNF, was to determine presence or absence of juvenile bull trout with some statistical rigor in areas of suitable habitat in the Upper Nisqually River, Upper Cispus River, Kalama River, Merwin Reservoir Lewis River, Upper Lewis River, and Columbia Gorge East Frontal drainages. The data are expected to help define the extent of suitable bull trout habitat at a stream reach level, and will confirm presence or absence with a given level of confidence using best available survey methods.

Results:

North Fork Lewis River. Eighty-eight bull trout were tagged in Swift Reservoir by WDFW. A total of four snorkel surveys were completed by WDFW and USFS in Pine Creek and another four in Rush Creek, tributaries to North Fork Lewis River. Population estimates were then computed for each week resulting in a combined population estimate of 542 (Figure 18). We are 95% sure that the spawning population size is between 439 and 689 adults.

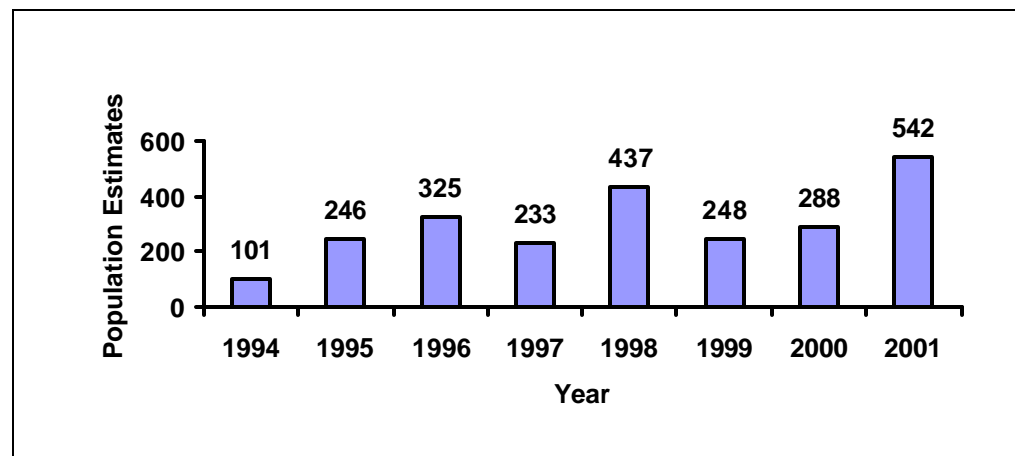


Figure 18 - Bull trout spawning population estimates for Swift Reservoir

The 2001 estimated population size for spawning bull trout in Swift Reservoir is 542 compared to the 8-year average of 303. Since fish in Swift Reservoir were tagged, we can only estimate the Swift Reservoir spawning populations that utilize Pine and Rush Creeks on national forest system land. Swift Reservoir population estimates for Pine and Rush Creek snorkels nearly doubled from the year 2000. In 2001, 77 percent of the tagged fish were observed in Rush Creek and 23 percent of the tagged fish were observed in Pine Creek, indicating that Rush Creek is the primary stream that bull trout migrate to from Swift Reservoir.



Evaluation: Population Trend and Influencing Factors

Bull trout population trends on GPNF appear to be in flux. A major flood in February 1996 hindered the reliability of the year's population estimate because of the difficulty in sampling fish during the spring.

Certain tributaries to Swift Reservoir, such as the Muddy River, contain sub-optimal habitat for bull trout. Despite restrictive angling regulations on Swift Reservoir and its tributaries, illegal take of bull trout still occurs on occasion. Lack of fish passage facilities at Swift Dam isolate the Swift Reservoir population from mixing and re-establishing with the isolated population of a Yale Lake tributary.

Recommended Actions to be Taken:

- Continue supporting education and law enforcement efforts to curb illegal take of bull trout.
- Where supported by a Roads Analysis, close spur roads to vehicular access that are known to be used for illegal harvesting of bull trout.
- Install adult traps in partnership with Trout Unlimited and WDFW to obtain actual spawner escapement counts.
- Participate on the Lewis River Hydroelectric Project Aquatic Coordination Committee to address bull trout needs in relationship to existing hydroelectric facilities North Fork Lewis River system.
- Continue to conduct surveys for bull trout in conjunction with WDFW and PacifiCorp in the Lewis River drainage on National Forest lands.
- Assess the distribution of bull trout within the Muddy River system.

In-Channel Habitat Structures 62d 

Introduction: Stream habitat restoration activities have been implemented on the Forest since the early 1980s. Activities generally focus on improving habitat availability and quality. The majority of restoration efforts have focused on improving habitat for anadromous species, primarily steelhead on the Wind River and East Fork Lewis River, and Chinook on the Cowlitz River and its tributaries. Monitoring provides important feedback for improving in-channel habitat structure designs and applications for future efforts.

Structure monitoring in 2004 was conducted on Iron Creek in the Cowlitz Valley Ranger District, and on Panther Creek in the Mt. Adams Ranger District. These structures were specifically designed to enhance fish habitat and monitoring focused on structures placed in Iron Creek and Panther Creek. Fish biologists surveyed over 100 structure sites evaluating the function and performance of individual structural development. Specific data were collected to provide insight on structure success. This section will only address the Iron Creek restoration project. Information from the Panther Creek project is insufficient to include in this year's monitoring report.

Method of monitoring for in-channel habitat structures consist of photo points, field observation, and ground measurements. Key to structure type, composition, length, intended function or objective is shown below (Table 12).



Table 12 - Key to fish habitat and hydraulic structure field						
<i>Structure Type:</i>	<i>Composition:</i>	<i>Structure Orientation</i>	<i>Structure Span</i>	<i>Objective:</i>	<i>Status:</i>	<i>Location:</i>
BR = Bar Protector	SL = Single Log	M = Main Channel	F = Full Span	A = Aggrade Channel	F = Fully Meeting Objective	I = Inplace
BK = Bank Protector	ML = Multi-Log	S = Side Channel	P = Partial Span	C = Cover	P = Partially Meeting Obj.	S = Shifted
CE = Channel Excavation	SB = Single Boulder	B = Gravel Bar	O = Off Channel	G = Gravel Recruitment	N = Not Meeting Objective	L = Left Site
FR = Floodplain Roughness	MB = Multi-Boulder	F = Flood Plain		BK = Bank Protection	D = Causing Damage	
CL = Cover Log	LB = Log/Boulder Complex			MR = Meander Reconstruction		
DL = Digger Log				FR = Floodplain Roughness		
LD = Log Deflector				GC = Gradient Control		
LJ = Log Jam				R = High Flow Refuge		
BB = Boulder Berm				S = Scour		

Iron Creek (2004)

The objectives of the Iron Creek project were to provide bank protection and structure to the floodplain, habitat and cover for young anadromous salmonids, and structure to the stream channel for pool development.

All structures in this project were constructed of boulders and logs that were found laying on the Iron Creek floodplain. No material was imported from off-site. Structures consist of a single log (log sill), multiple logs (log jam), multiple boulders, or a combination of boulders and logs. The structure locations for Iron Creek were based on analysis of survey data collected during the summer of 1998.

Thirty structures were installed for this project. Figure 19 shows the estimated position of structures that were installed throughout Iron Creek. Figure 20 and Figure 21 show the photo sequence of sites #1 and #8. Three of the structures are skeleton log-jams that were designed to catch debris and either raise the grade of the stream, control the alignment of channel or protect banks and other habitat features such as gravel bars. The remaining structures are a combination of vanes, log stills, or bank protection/cover logs.

All of the logs in the structures have been tagged with a 1-inch round aluminum tag and each tag has been stamped with a number. Each log is inventoried for a set of parameters and the parameters entered into a data set made up for the entire project area. The logs used in the structures are part of a larger data set. These tags will help track the movement of logs.

Iron Creek
Forest Plan Monitoring
Effectiveness of In-Channel Habitat Improvement Structures.
September, 2004

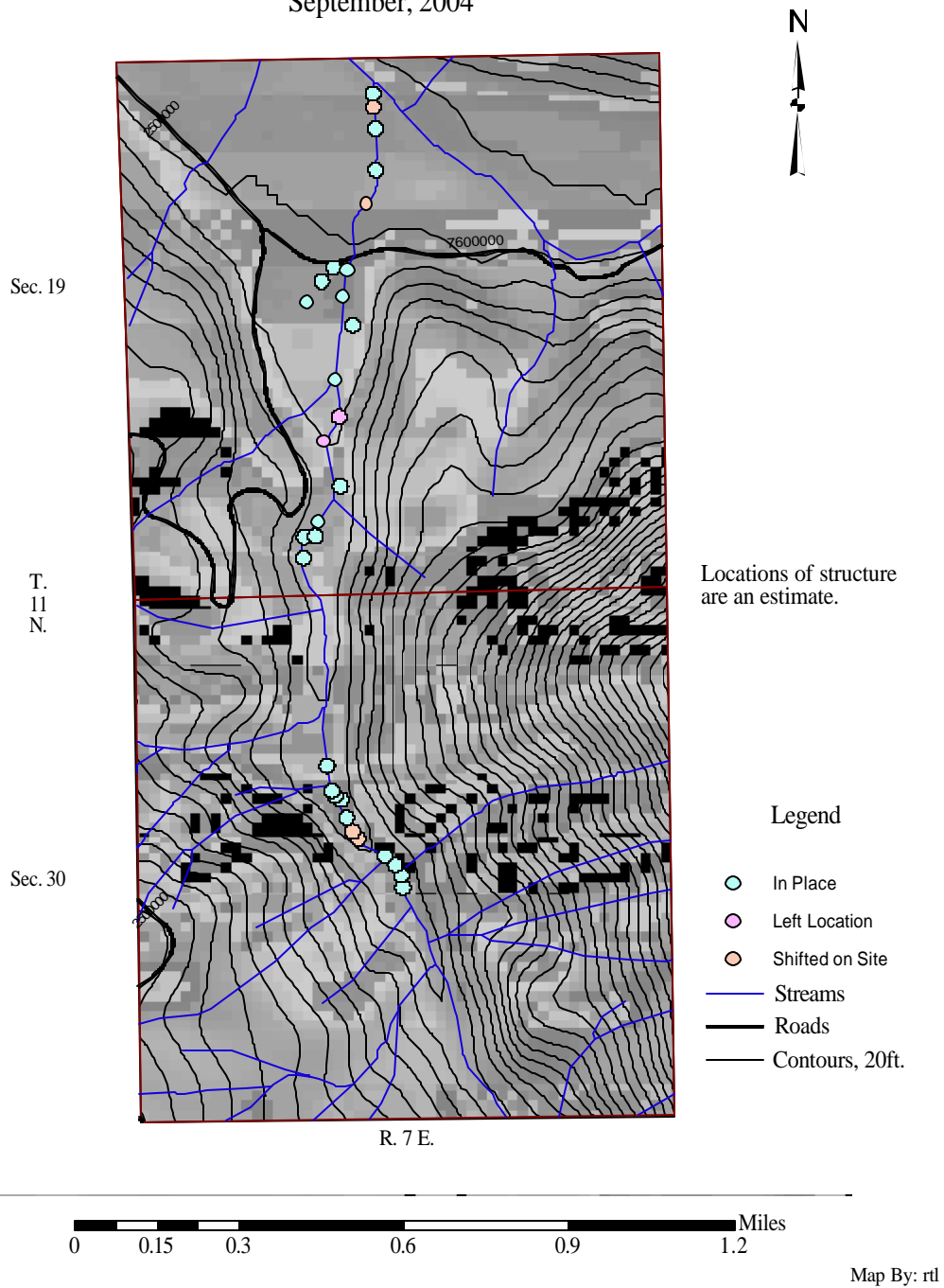


Figure 19 - Location of structures monitored in Iron Creek, Lewis County, Washington (2004)



Panther Creek

The objectives for Panther Creek restoration project were to construct two log complexes that would protect 175' of eroding bank, create a scour pool greater than three feet in depth at low flow, and provide cover for adult and juvenile steelhead.

Results:

Iron Creek

In the five winter seasons since 1999, when the project was completed, there have been three small flood events, estimated 5 and 10-year events. These events have moved, buried, or destroyed six (20%) of the structures (Table 12 and Table 13). The remaining 24 (80%) structures are still in place and functioning as designed. Two rock weir structures on sites #17 and #18 appear to be completely gone. A couple of the boulders remain in place at site #17. However, none of the boulders at site #18 could be identified as being part of the structure. It is possible that part or all of the structure at site #18 is buried under substrate. Two things may have happened at site #17 to destroy the structure; 1) the channel cut around the right bank anchor boulder, and 2) the scour depth was deeper than the base boulders for the weir, causing them to roll.

Three of the structures that have shifted are vortex weirs made of boulders. The most common problem with this type of structure is getting the base boulders below scour depth and this is what appears to have been the problem. In each case, one of the boulders making up the structures was found out of place. Site #6 was made up of three logs. One of the logs has moved down stream and is now hung-up on site #7. A logjam next to the Road 76 Bridge was found vandalized by woodcutters. It appears that people camping in the area are using the logjam for firewood. Four are partially in place and still providing some functionality to the floodplain/channel, and therefore were considered to be partially functioning.

Maintenance is not necessary at this time. Resource damage to the surrounding area (opening an access route, running over the existing vegetation, etc.) would offset the value of rebuilding the two missing structures on sites #17 and #18. The structures that have shifted in place are still providing some measure of functionality and again, the resource damage of getting an excavator out to the site would offset any gains in structure maintenance.

**Table 13 - Monitoring results for Iron Creek (2004)**

Structure Number	Structure Type	Structure Composition	Structure Length	Intended Function	Current Status	Current Location	Maintenance Needed
1	LS	LB	F	GC	F	I	N
2	BB	MB	F	GC/S	F	I	N
3	RD	MB	P	R/S	F	I	N
4	LD	LB	P	C/R	F	I	N
5	VW	MB	P	S	P	S	Y
6	CL	ML	P	C/R	P	S	N
7	LD	LB	P	C/R	F	I	N
8	LD	SL	P	C/R	F	I	N
9	BP	MB	P	B	F	I	N
10	RD	MB	P	GC	F	I	N
11	LD	SL	P	C/R	F	I	N
12	LJ	ML	P	C/B	F	I	N
13	BP/LD	LB	P	B/S/R	F	I	N
14	LJ	ML	P	B/C	F	I	N
15	VW	MB	F	S/GC	F	I	N
16	LJ	ML	P	C	F	I	N
17	VW	MB	F	GC	N	L	Y
18	UV	MB	F	GC	N	L	Y
19	LJ	ML	P	C/B	F	I	N
20	UV	MB	F	GC	F	I	N
21	VW	MB	F	GC/S	F	I	N
22	VW	MB	F	GC/S	F	I	N
23	LJ	ML	P	B	F	I	N
24	BP	ML	P	B	F	I	N
25	LJ	ML	P	B	F	I	N
26	VW	MB	F	GC/S	P	S	Y
27	VW	MB	F	GC/S	F	I	N
28	VW	LB	P	GC/S/C	F	I	N
29	VW	MB	F	GC/S	P	S	Y
30	LJ	ML	P	B	F	I	N



One excellent method for monitoring the success of large wood and boulders placed in streams to improve habitat conditions or stream function is to visually monitor during a high flow event. Below are photo sequences for sites #1 and #8 from finished product, during high flows, and as of September 2004. Both sites #1 and #8 are fully meeting their objectives.



Finished
Structure,
Sept. 1999



During high
flows, (10-year
event) Nov. 1999



As of Sept. 2004

Figure 20 - Photo sequence of Iron Creek Structures at site #1, Lewis County, Washington



Finished Structure,
Sept. 1999



During high flows,
(10-year event)
Nov. 1999



As of Sept. 2004

Figure 21 - Photo sequence of Iron Creek Structures at site #8, Lewis County, Washington



Panther Creek

The objectives for the Panther Creek log complexes are fully met and no maintenance is needed at this time (Table 14). Deposition of sediment and vegetation growth downstream of the structures is evidence that the structures are functioning properly and protecting campground banks. In addition, parts of the log structures that were intended to scour pools and provide cover for fish are still intact and functioning as intended.

Table 14 - Monitoring results for Panther Creek (2004)

Structure Type	Structure Composition	Structure Length	Intended Function	Current Status	Current Location	Maintenance Needed
BP, CL, DL	Multi-Log	Partial	B, C, S	Fully Meeting Obj.	In place	No

Evaluation: Overall project goals were to provide structure to the Iron Creek floodplain and Panther Creek, and indirectly improve habitat for salmonid fish species. Results from the monitoring are positive. In Iron Creek only 2 structures out of 30 are gone, and 28 that were installed are still in place requiring minimal maintenance.

Effectiveness monitoring should be conducted during a time when the structures are functioning as designed, such as shown in the photo sequence for sites #1 and #8. Surveys conducted during low flow make it difficult to recognize all processes influencing the success or failure of individual treatment sites. Efforts should be made to include some assessment of fish use if part of the objective is to provide habitat for fish.

Recommended Actions to be Taken: The following actions are recommended:

- Emphasize interdisciplinary involvement during project initiation and design. Assure, at a minimum, the design team has the following mix of skills and expertise:
 - ✓ An understanding of fluvial geomorphic processes.
 - ✓ An understanding of hydraulic processes and relationships.
 - ✓ An understanding of life cycles and ecology of fishes present in project area.
 - ✓ Practical experience with heavy machinery and construction of in-stream structures.
- Establish a Forest monitoring protocol, compatible with the Regional protocol, that addresses all types of in-channel habitat improvement designs and applications
- Conduct fish use surveys during the period when structures are designed to function.
- Continue to monitor physical objectives, looking at the Forest Plan and



Region 6 standards as a basis for comparison.

- Increase sample size of in stream structure monitoring (Note: This was a recommended action to be taken in 2001 when less than 10 structures were sampled; this action was accomplished in 2004).
- Develop a long-term sampling scheme of representative structures and stream types across the Forest.
- Monitor structures after high stream flow events at the first, and safest, available opportunity.
- Due to budget constraints and data quality, develop a prioritization of funding availability for in-channel structure monitoring. For example, some projects may be monitored every other year with help from volunteers or student groups.
- Restoration monitoring and to some extent implementation, such as mitigation measures, should be used as a tool for educational purposes with volunteers or student groups.
- Establish clear contract clauses that will help prevent the establishment of noxious weeds within project areas. Monitor for noxious weed establishment at project sites.

Level II Stream Surveys ⓘ

Introduction: During the summer of 2004, between July and October, seven streams were surveyed following Region 6 Level II stream survey protocol. The purpose of the level II inventory is to identify existing stream channel, riparian, and aquatic ecosystem conditions on a watershed scale. The data is used to monitor natural disturbance and management activities on the aquatic ecosystem.

Total miles surveyed by Forest Service personnel were 24.5 miles, spread out over seven streams and three districts, Table 15 and Figure 22.

Table 15 - Streams surveyed in 2004

District	Stream Name	Length Surveyed (miles)
Cowlitz Valley	Big Creek	3.5
Mount St. Helens National Volcanic Monument	Clearwater Creek	4.5
Cowlitz Valley	Ferrous Creek	2.7
Mt. Adams	Lost Creek	5.4
Mount St. Helens National Volcanic Monument	Rush Creek	4.8
Cowlitz Valley	Wakepish Creek	2.4
Cowlitz Valley	Walupt Creek	1.2

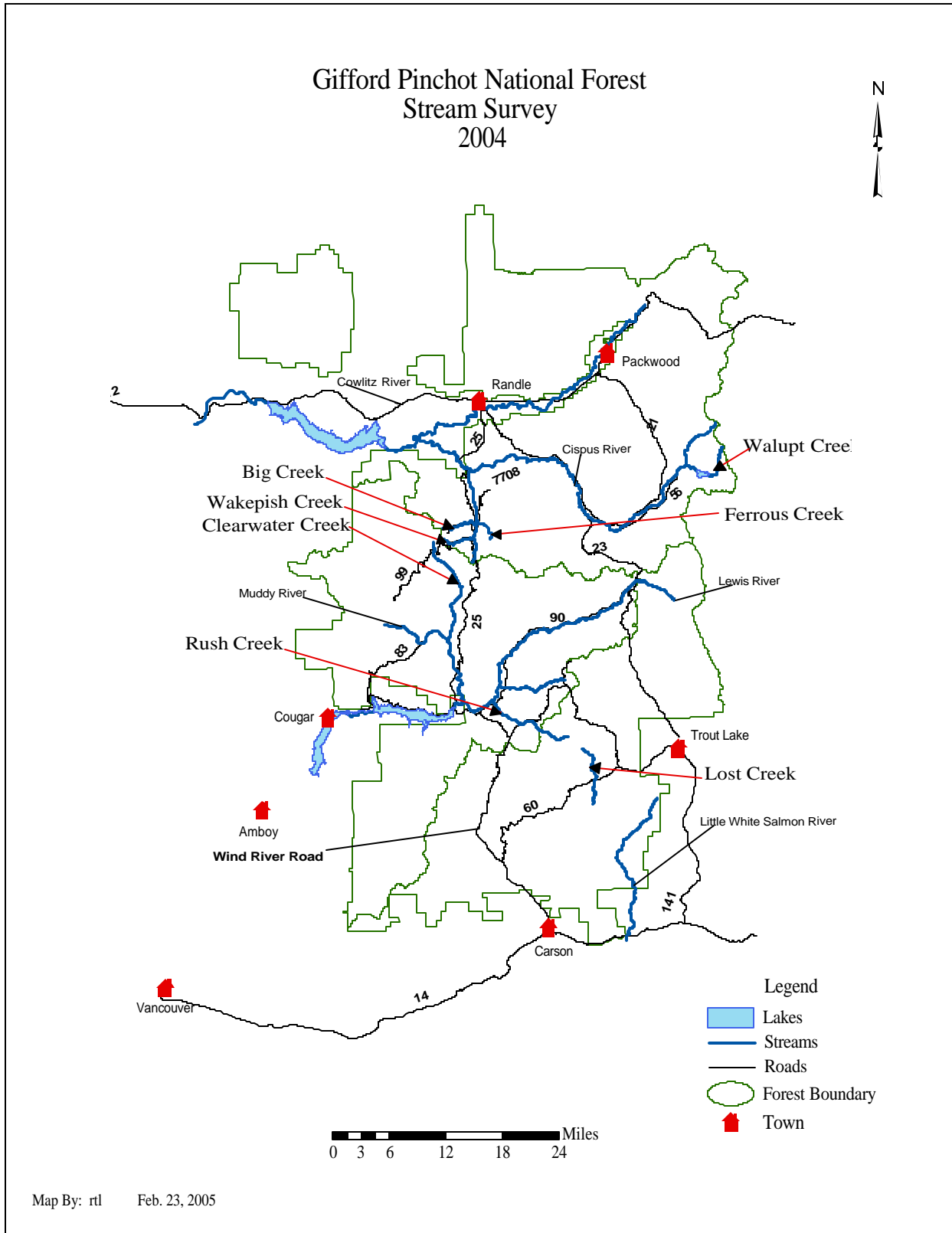


Figure 22 - Map of stream locations surveyed with Region 6 Level II protocol, Gifford Pinchot National Forest, Washington, 2004



Results: Each stream presented its own character and unique challenges based on location within National Forest lands. For example:

- Clearwater Creek is located in the Mount St. Helens National Volcanic Monument;
- Walupt Creek in the Goat Rocks Wilderness with limited access;
- Rush Creek with flows over a 100 cubic feet per second;
- Ferrous Creek with 19 waterfalls and two at or over 90 feet;
- Lost Creek within a cattle allotment; and
- Big Creek and Wakepish Creek in a heavily timber management area.

Average stream gradients ranged from 0.62 (Lost Creek) to over 14 percent (Ferrous Creek). All streams surveyed in 2004 are lacking large woody material and pools with a residual pool depth of greater than 3 feet, Table 16. Overall, stream channel stability rated out as fair to good except for Lost Creek. Width to depth ratios are high for all streams indicating an over-widening of the channel. Below are executive summaries for each stream surveyed. Additional information can be found in completed stream survey reports located at the respective District.

Table 16 - Stream names and key indicators for streams surveyed on the Gifford Pinchot National Forest, Washington, during the summer of 2004

Stream Name	Watershed	Tributary To:	Drainage Area (sq miles)	USGS Quad	Survey Length (Miles)	Discharge (cfs)	Fish Population	Wood	Pool	Bankfull W:D	Channel Stability
Big Creek	Lower Cispus	Iron Creek	6.2	French Butte & Spirit Lake East	3.5	8.1	Rainbow & Cutthroat	22.7	2.2	23	Fair
Clearwater Creek	Lewis River	Muddy River	39.6	Smith Creek Butte	4.5	64.48	Rainbow & Cutthroat	36.6	3.4	56	Fair
Ferrous Creek	Lower Cispus	Iron Creek	2.7	French Butte	2.7	0.8	Cutthroat	14.1	1.5	20	Fair
Lost Creek	Little White Salmon	Big Lava Field	18.4	Little Huckleberry Mountain	5.4	41.97	Rainbow & Eastern Brook	24.0	2.2	27	Not Done
Rush Creek	Lewis River	Lewis River	26.4	Burnt Peak	4.8	Not Measured	Bull Trout	36.9	3.8	Not Done	Good
Wakepish Creek	Lower Cispus	Iron Creek	4.1	French Butte & Spirit Lake East	2.4	5.4	Cutthroat	26.9	2.2	49	Good
Walupt Creek	Upper Cispus	Cispus River	11.4	Walupt Lake	1.2	11.4	Rainbow & Cutthroat	56.38	3.4	17	Good

Soil Productivity 60 

Introduction: Maintenance of soil productivity is essential to sustaining ecosystems and is mandated by every act of Congress directing national forest management. Region 6 Forest Service Manual (2550.3-1, R6 Supplemental # 50) and the Gifford Pinchot National Forest Plan require a minimum of 80 percent of an activity area to have unimpaired soil productivity.

Two projects were assessed for compliance with this standard: Unit 32 of the Helitower Timber Sale and the Middle-Service Trails Reconstruction Project, site numbers 3 to 10 and number 12. The Forest Service Soil Scientist assessed soil productivity by measuring the extent of detrimental soil conditions, considering Region 6 standards and guidelines. Assisted by GIS technology, detrimental conditions were measured by visually estimating the dimensions of skid trails, roads, and landings. The field investigation targeted the most likely disturbed areas, noting displacement where subsoil was exposed.



Figure 23 - Trail reconstruction relocated a popular trail around steep, eroding soils



Results: Detrimental soil compaction and soil displacement increased to approximately one percent of Helitower Timber Sale's Unit 32, based on the area occupied by the landing and temporary road. The Forest Plan standard allows for 20 percent disturbance. The deep ripping mitigation measure (to restore soil compaction) was delayed for firewood cutting.

The areas monitored met the standards for protection of soil productivity.

The majority of detrimental soil conditions where the Middle Service Trail Reconstruction took place are due to pre-existing impacts, mostly National Forest System recreation trails. With respect to Forest Plan standards and guidelines, the extent of detrimental soil compaction and displacement was not calculated – the project area does not have a delineated boundary.

Evaluation: The monitored projects met the standards and guidelines for long-term soil productivity. When the ripping mitigation measure is completed, the Helitower Timber Sale will comply with specifications in the contract and mitigation measures in the Environmental Analysis.

The structures constructed through the Middle Service Trail Reconstruction project addressed the inherent rutting and erosion problems (Figure 23). On the right side of the photo, access to damaged soils on the old layout was blocked by boulders. The project itself did not increase the severity of detrimental soil conditions, and damage to previously undisturbed soils was minimal in extent.

The Helitower unit was logged with a helicopter logging system design. This resulted in less detrimental soil conditions than a ground-based logging system would have.

Recommendations: Monitor the prescribed deep ripping (subsoiling) of the landing and temporary road on Helitower Timber Sale's Unit 32.

Best Management Practices (BMPs) 61 ☺

Introduction: Best Management Practices are the primary mechanism to ensure water quality standards are met during project implementation. Best Management Practices (BMPs) are selected and tailored for site-specific conditions to provide project level protection of water quality. The Clean Water Act and the National Forest Management Act directs us to protect streams, stream banks, shorelines, lakes, wetlands and other bodies of water from detrimental changes in water temperature, blockages of water courses, and deposits of excessive sediment, where activities have the potential to seriously and adversely affect water conditions or fish habitat.

Timber Sale Unit 32 did not comply with the best management practices associated with the helicopter landing.

Results: One harvest unit of the Helitower Timber Sale and a trail reconstruction project were monitored for compliance with Best Management Practices (BMPs). The timber sale's Unit 32 did not comply with the best management practices associated with the helicopter landing. The Middle Service Trail Reconstruction Project did comply with site-specific best management practice for realigning and armoring a trail stream approach, and obscuring the former approach (Figure 24). This trail reconstruction project will be having additional work completed in the summer 2005.



Photo: Bengt Coffin

Figure 24 - Hairpin turn on Middle Service Trail Reconstruction Project



Helitower Unit 32. The log landing was not ripped or seeded to allow firewood cutting. This was considered a major departure of BMPs, T-14 Revegetation of Areas Disturbed by Harvest Activities and T-15 Log Landing Erosion Prevention and Control.

Recommendation: Complete the recommended subsoiling and seeding treatment of the landing as soon as possible.

Stream Temperature Monitoring ⓘ

Introduction: The Clean Water Act and the Northwest Forest Plan directs the Forest to maintain the physical, chemical and biological integrity of our aquatic resources. The Forest Plan mandates the Forest manage its streams to fully support all designated beneficial uses of water. Cool water temperatures are important in providing quality aquatic habitat and maintaining beneficial uses.

The 303(d) list is considered those water bodies in the Washington State Department of Ecology proposed Category 5 – in this context, waters that exceed 16 degrees C (61 F). Forty water bodies on or immediately downstream from lands managed by the Gifford Pinchot NF are listed in Category 5 (Table 17).

Table 17 - Twenty-five streams on the Gifford Pinchot NF have at least one Category 5 segment

Watershed	Stream	Comments
Upper Cispus River	Walupt Creek	Natural lake exposed to solar radiation releases warm waters to creek.
	East Canyon Creek	Has Water Quality Restoration Plan
	North Fork Cispus River	Has Water Quality Restoration Plan
	Cispus River (11N 10E 25)	No Forest Service data exceeds standard – possible listing error.
Lower Cispus River	Pumice Creek	Has Water Quality Restoration Plan
	Yellowjacket Creek	Has Water Quality Restoration Plan
	Greenhorn Creek	Has Water Quality Restoration Plan
	1919 Creek	Has Water Quality Restoration Plan
	Iron Creek	Has Water Quality Restoration Plan
	Cispus River	3 segments
Middle Cowlitz River	Lake Creek	
	Lynx Creek	
	Silver Creek	2 segments
Nisqually River	East Creek	
	Little Nisqually River	
	Little Nisqually River – West Fork	2 segments
Muddy River	Clearwater Creek	
	Clear Creek	
	Muddy River	2 segments



Watershed	Stream	Comments
Upper Lewis River	Quartz Creek	2 segments
	Lewis River	2 segments
Yale Reservoir	Siouxon Creek	
East Fork Lewis River	Copper Creek	Has Water Quality Restoration Plan
	East Fork Lewis	Has Water Quality Restoration Plan
Little White Salmon	Little White Salmon River	2 segments

Results: During the summer of 2004, 71 stream sites were monitored continuously. Stream temperatures at sites within the Upper Cispus River, Lower Cispus River, Muddy River, East Fork Lewis River and Upper Lewis River Watersheds follow a similar pattern with less extremes in the summer of 2002 (Figure 25).

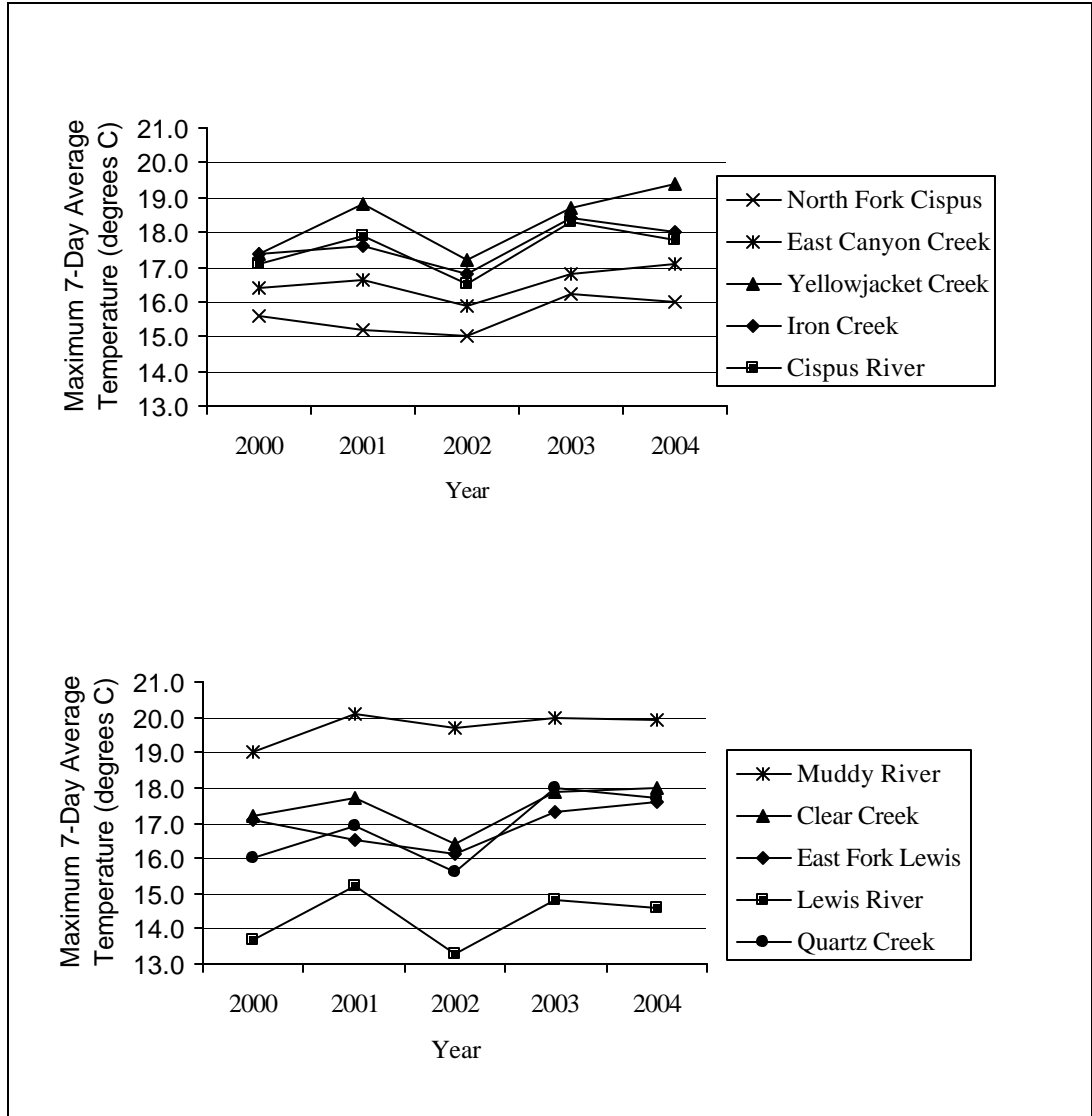


Figure 25 – Five years of temperature patterns in the Upper Cispus River, Lower Cispus River, Muddy River, East Fork Lewis and Wind River

Upper Cispus River Watershed

The North Fork of the Cispus River contributes about 10 percent of the Cispus River (Figure 26) base flow. The on-going recovery of shade along tributaries flowing into the North Fork Cispus along with the addition of large wood to the main stem North Fork Cispus may reduce the North Fork Cispus stream temperatures so that it meets the standard in the near future.

Walupt Creek below Walupt Lake had the highest maximum 7-day average (22.7° C) in the watershed. This high temperature at the lake outlet is due to solar radiation heating the surface waters of Walupt Lake. Water entering the lake from the wilderness had a maximum 7-day average of 11.2° C.

East Canyon Creek contributes less than 5 percent of the base flow of the Cispus River. The base flow channel width (average of 25 feet) and wide floodplain allows solar heating of East Canyon Creek in the lower 3 miles of the sub-



watershed. Sediment inputs from roads and human-caused landslides contributed to the wide low flow channel width.

Upper Cispus River Watershed

Stream Temperatures

July 1 - September 15, 2004

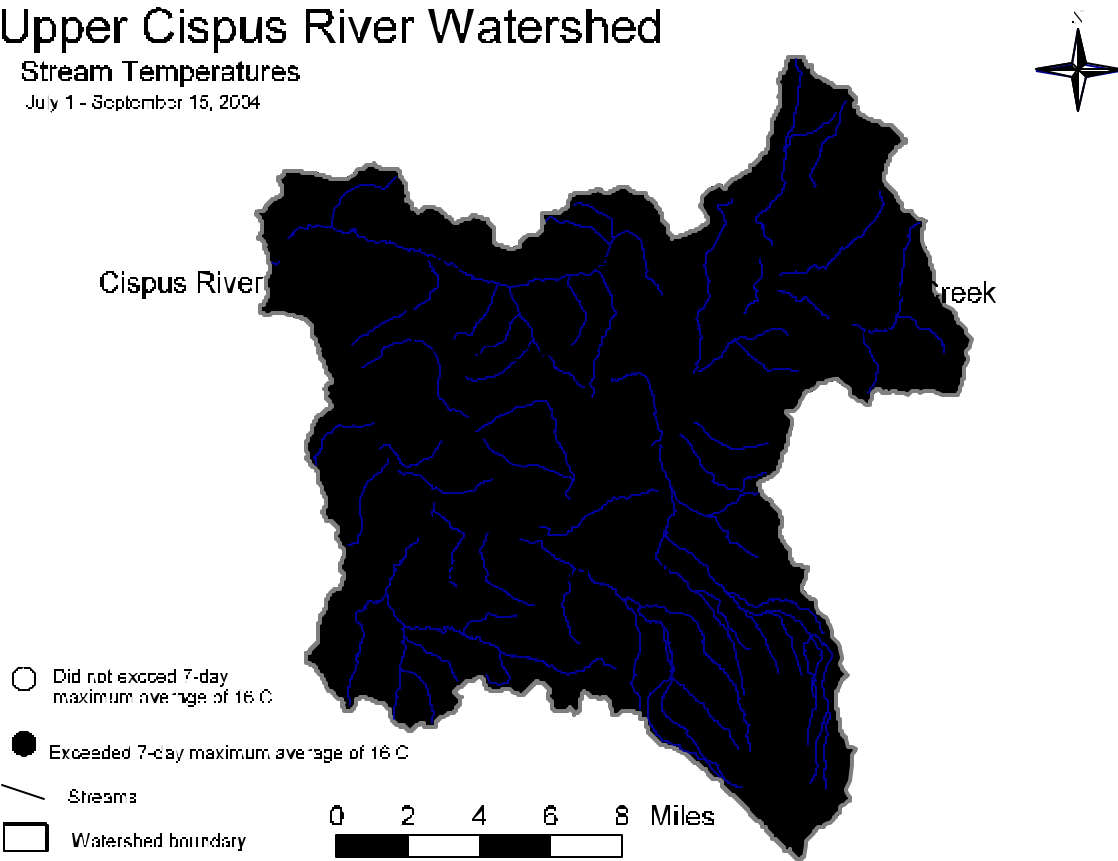


Figure 26 - Temperature Monitoring Locations in the Upper Cispus River Watershed

Lower Cispus River Watershed

Woods Creek had the warmest maximum 7-day average (19.6° C) in the watershed (Figure 27). Woods Creek has exceeded State standards since a large beaver dam in the upper stream reaches failed in the winter of 2003. Continuous monitoring never recorded temperatures exceeding 16 ° C before the dam failure, although spot temperature readings did exceed 16 ° C. Beaver dams can allow for deep water which is heated less by solar radiation.

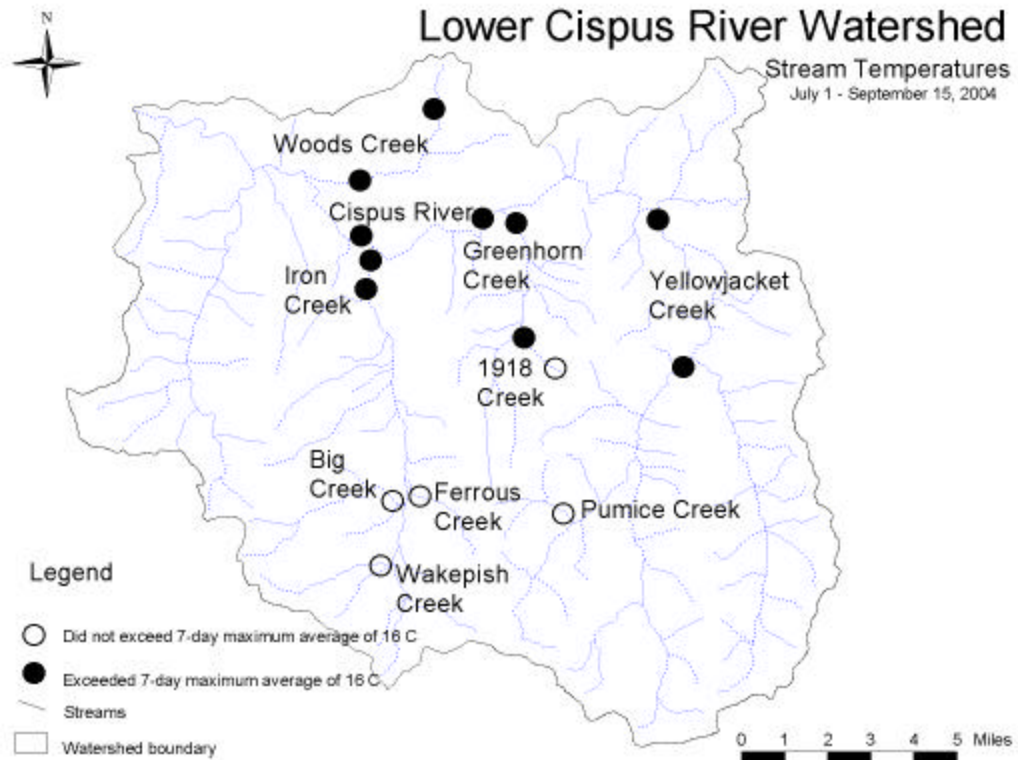


Figure 27 - Temperature Monitoring Locations in the Lower Cispus River Watershed

Pumice Creek’s maximum 7-day average did not exceed State temperature standards for the third consecutive year after exceeding in 2001.

Yellowjacket and Iron Creek maximum 7-day average were 18.0° C or warmer. Yellowjacket Creek and Iron Creek sub-watersheds have unstable channels resulting in stream widening and shifting channel position, which contribute to elevated stream temperature. Past and present sediment delivery from roads and landslides are stored and processed within the lower flat reaches of these creeks and are transported or slowly stabilized over time.

Shade loss (8-13 percent) from past riparian harvest and natural disturbances in Yellowjacket, Greenhorn, Iron, and Woods Creek sub-watersheds also contribute to elevated stream temperatures.



Middle Cowlitz River Watershed

Silver Creek, about one mile from the confluence with the Cowlitz River had the highest maximum 7-day average temperature (17.3° C) in the watershed (Figure 28).

Willame Creek and Siler Creek maximum 7-day average temperature remained below the standard for all the years monitored.

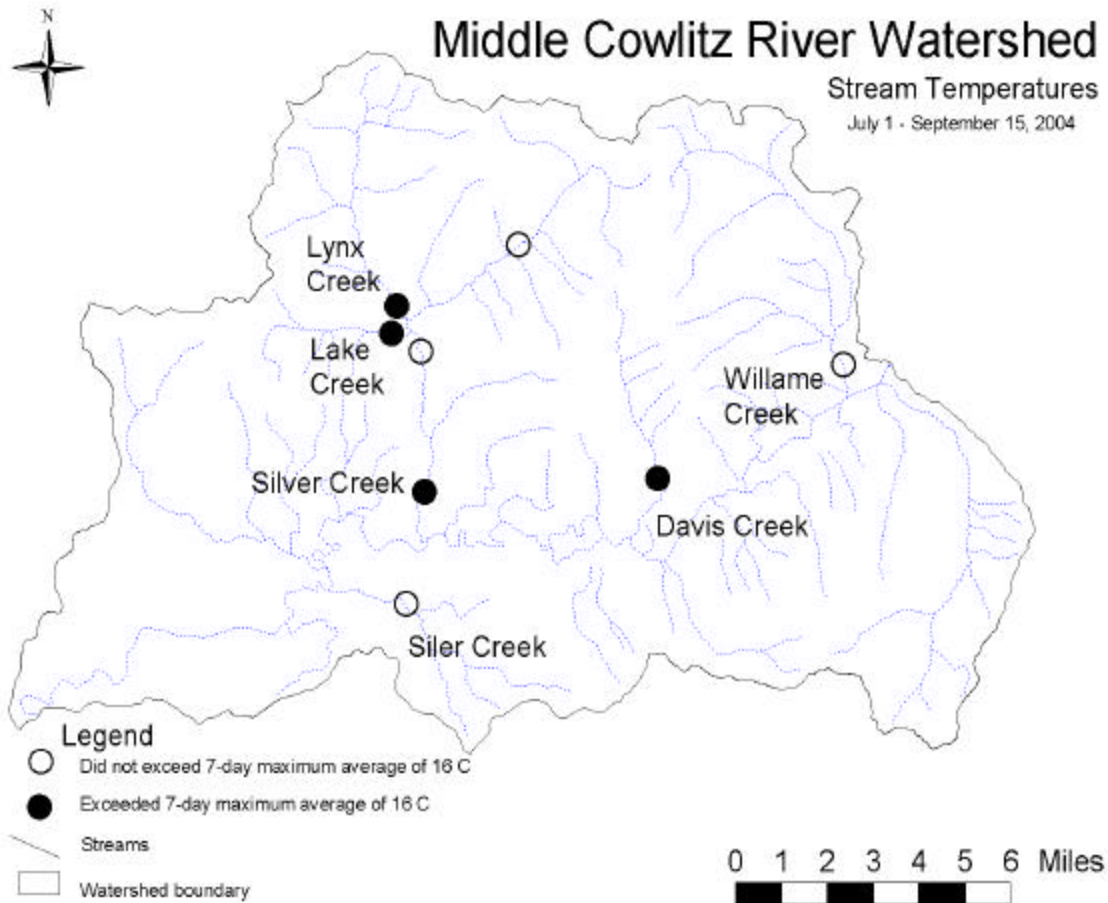


Figure 28 - Temperature Monitoring Locations in the Middle Cowlitz River Watershed

Past management activities such as removal of riparian shade, road construction and large wood removal probably contributed to the present streams with elevated stream temperatures, although a comprehensive analysis has not been completed to date.

Upper Nisqually River Watershed

The upper West Fork Little Nisqually River had the warmest maximum 7-day average in the watershed (Figure 29) at 18.6° C.

Catt Creek and East Creek maximum 7-day average exceeded 16° C.

Past management activities such as removal of riparian shade, road construction and large wood removal probably contributed to the present elevated stream temperatures in the streams, although a comprehensive analysis has not been completed to date.

Upper Nisqually River Watershed

Stream Temperatures

July 1 - September 15, 2004

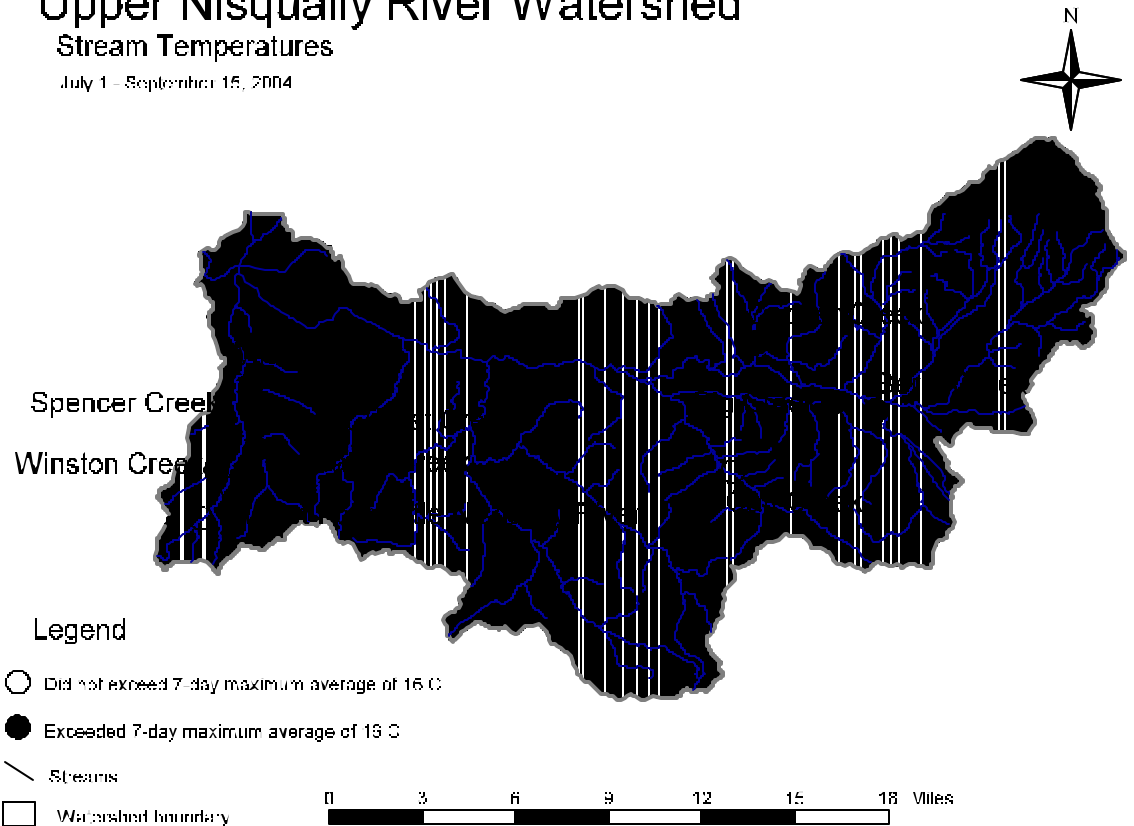


Figure 29 - Temperature Monitoring Locations in the Upper Nisqually River Watershed



Upper Lewis River Watershed

The main stem Lewis River exceeded the temperature standard at all stations downstream of Quartz Creek (Figure 30), as it does during most years. Quartz Creek continues to exceed the temperature standard at two locations. Alec Creek remained below the temperature standard for the third year monitored (2000, 2003 and 2004).

Past management activities such as large wood removal of the main stem Lewis River or past removal of riparian shade along tributary streams probably contributed to the elevated stream temperatures, although a comprehensive analysis has not been completed to date.

Upper Lewis River Watershed Stream Temperatures June 15 - September 15, 2004

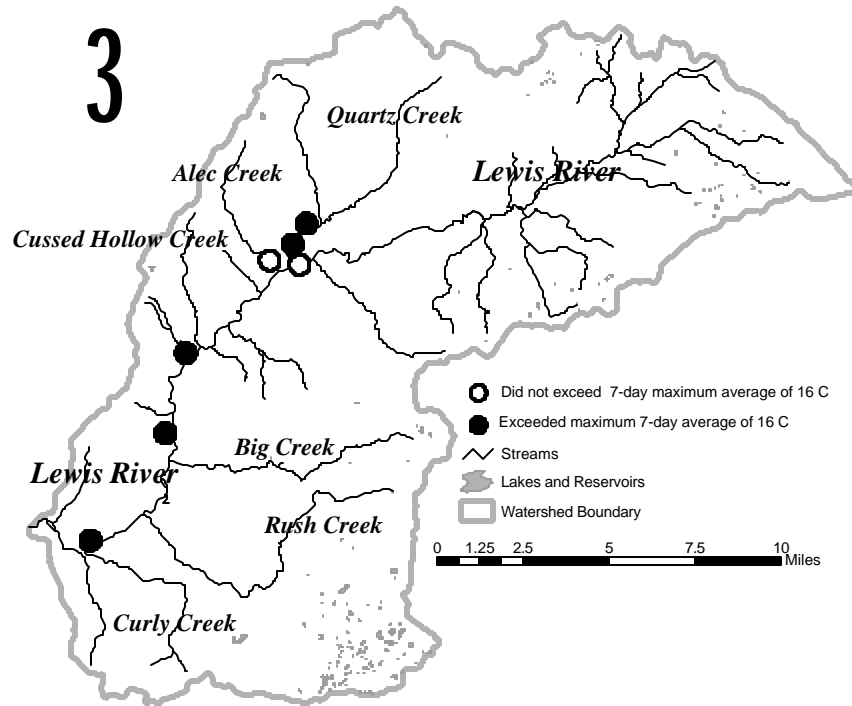


Figure 30 - Temperature Monitoring Locations in the Upper Lewis River Watershed

The Muddy River and Swift Reservoir Watersheds

The Muddy River and Clearwater Creek (Figure 31) continue to exceed the standard due to the effects of the 1980 Mount St. Helens Volcanic Eruption which removed shade-producing vegetation and delivered excessive sediment resulting in stream widening.

Clear Creek has exceeded the standard for the past 8 years. Instream and floodplain placement of large wood structure in the lower three miles of Clear Creek may decrease stream widths with resultant decreases in stream temperatures.

Pine Creek (Swift Reservoir Watershed) had a maximum 7-day average stream temperature of 14.5°C. This creek has known bull trout populations.

***Muddy River and Swift Reservoir-Lewis River
Watershed Stream Temperatures
June 15 - September 15, 2004***

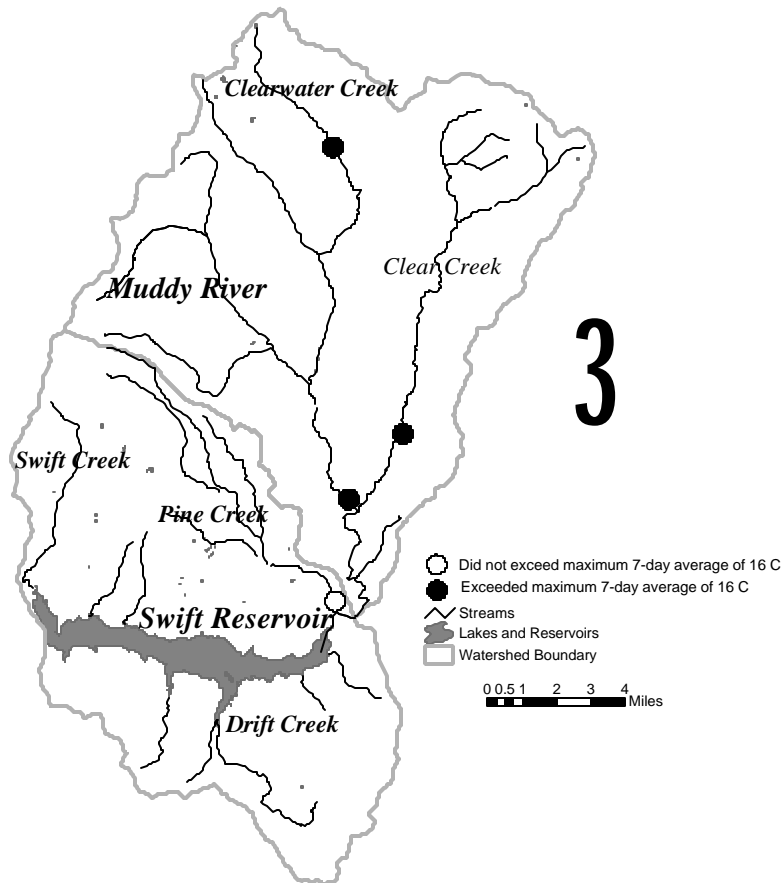


Figure 31 - Temperature Monitoring Locations in the Muddy River and Swift Reservoir Watersheds



East Fork Lewis River Watershed

The Green Fork 7-Day average has never exceeded the 16°C state standard during the eight years of record.

The maximum 7-day average of the main stem East Fork Lewis River (Figure 32) exceeded 16°C during 2004 at all stations. The East Fork Lewis Water Quality Restoration Plan (2002) had three objectives towards decreasing stream temperatures:

- Restore shade to limit solar radiation to streams
- Limit road related runoff so that channel width to depth ratio limits increases to stream solar radiation
- Restore channel integrity so that low flow channel width to depth ratio limits increases to stream solar radiation

Planning for the enhancement of riparian conifer growth along the south side of the East Fork is underway with implementation planned for Summer 2006.

*East Fork Lewis River Watershed Stream Temperatures
June 15 - September 15, 2004*

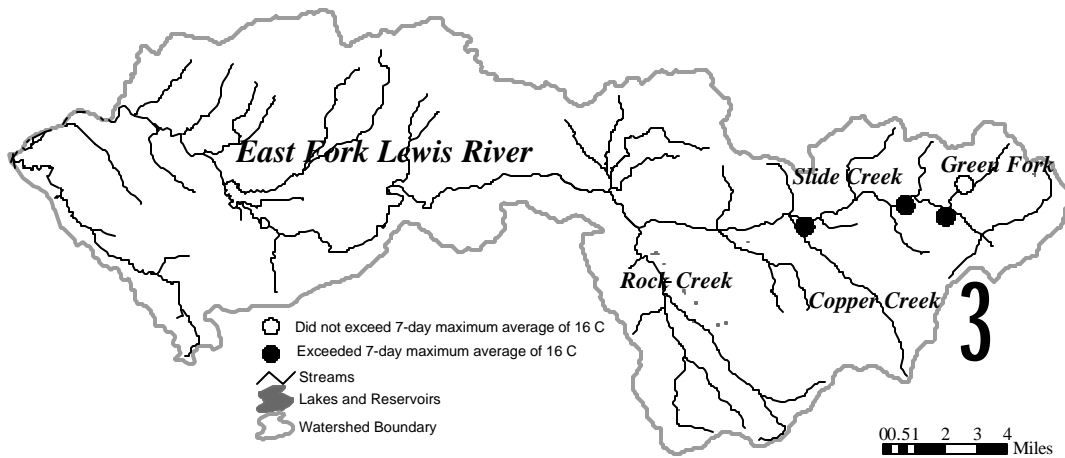


Figure 32 - Temperature Monitoring Locations within the East Fork Lewis River Watershed

Yale Reservoir and Merwin Reservoir Watersheds

Canyon Creek (Figure 33) maximum 7-Day average has never exceeded 16°C during the six years of record.

Siouxon Creek maximum 7-Day average exceeded 16°C during 2004 as it has during all seven monitoring years.

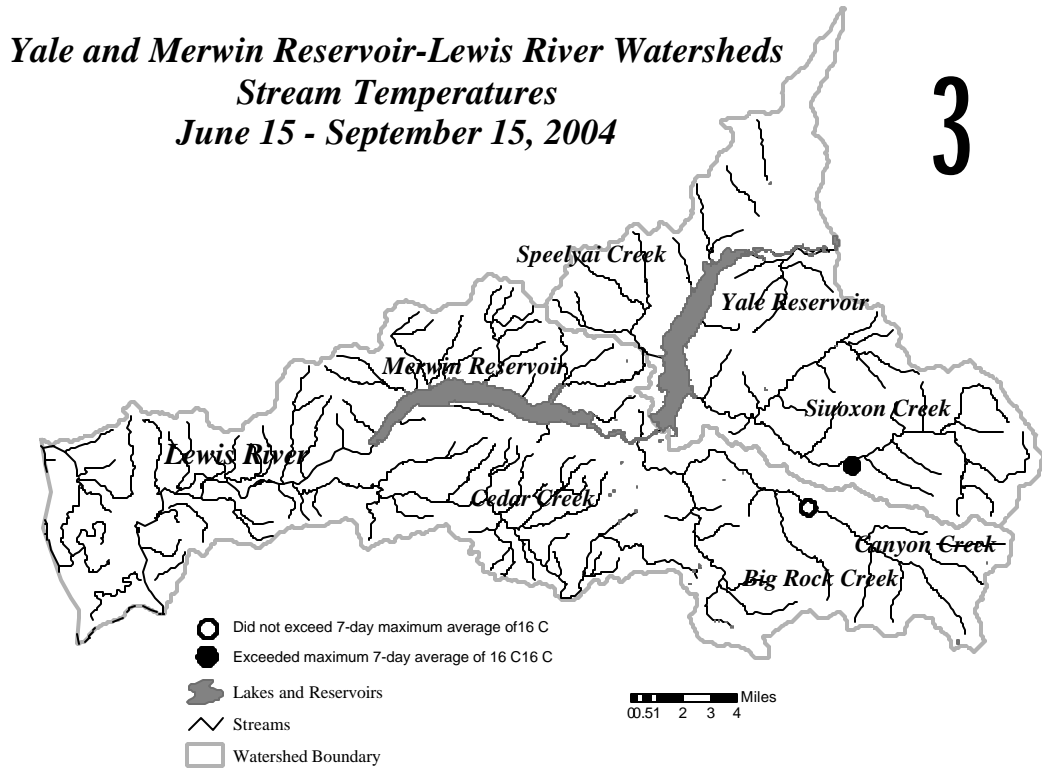


Figure 33 - Temperature Monitoring Stations in the Yale and Merwin Reservoir Watersheds



Wind River Watershed

Water temperatures (maximum 7-Day average) exceeded 16° C at nine of fourteen monitoring stations in the watershed(Figure 34).

Trout Creek above Martha Creek had the highest recorded temperatures of the year at 22.8° C.

Trout Creek above Martha Creek had the greatest duration of temperature standard exceedances, with 34 occurrences when the 7-day average daily max temperature exceeded 16° C.

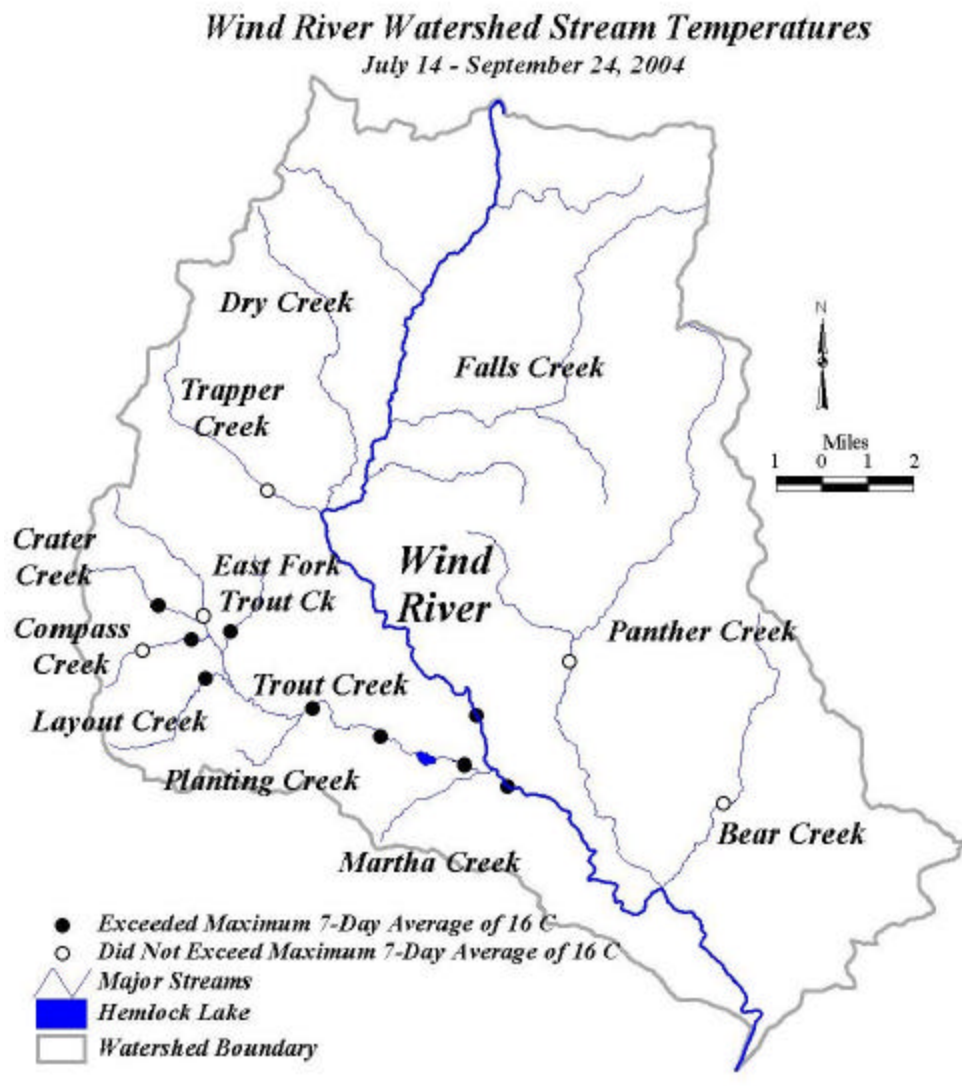


Figure 34 - Temperature monitoring locations in the Wind River Watershed

Road Management 70 ☺

Introduction: Road Maintenance - The Forest has continued to receive declining funds for road maintenance for FY 2004. The outlook for future years funding levels for road maintenance funds shows continuing declines.

Currently budget allocations are not providing the necessary funding levels to meet all our Forest road maintenance needs. Our present road system has 834 miles of road that are subject to the Highway Safety Act (Maintenance Level 3-5). The focus of road maintenance is the health and safety of the public and Forest Service employees who use the roads. The maintenance needs for level 3-5 roads is greater than our budget allows and leaves few dollars to accomplish maintenance on 1528 miles of lower standard level 2 roads.

The Forest has been able to benefit from other funding, which has allowed us to accomplish more road maintenance and road improvements beyond the limits of our normal maintenance budget. Title II funds on projects submitted through the Resource Advisory Committees have supported heavy maintenance, road stabilization, and culvert and drainage improvements on lower standard roads which would be beyond the normal road maintenance priorities. The Forest has applied for Capital Improvement Funds (CIP) for major reconstruction on main forest routes and for improvements to road-stream crossing to improve passage for aquatic species.

It became a high priority to define a road system that met the objectives of matching an affordable road system in line with declining budgets and meet the safety requirements for the traveling public. The Engineering group on the Forest began the review of the "Right Size Road System" (RSRS) for the Gifford Pinchot National Forest early this year. The "RSRS" analysis used the existing "Roads Analysis - Gifford Pinchot National Forest; July 2002" results, existing road conditions, traffic volumes, Forest recreation sites, and input from specialists across the Forest to define a safe and affordable road system. This product would produce a mix of Maintenance Level (ML) 3 - 5 roads across the forest to serve passenger car traffic. In addition, there would be resource protection work done on ML 1 - 2 based on watershed priorities. This Draft "RSRS" plan has went through several in-house reviews and is still being revised. The Road Maintenance Plan tiers off this "RSRS" plan and in 2005 we plan to start implementation. We will monitor the results and use this information to further define the Draft "RSRS" plan.

Road Closures - Road closures include permanent and seasonal closures and decommissioning. Permanent closures are year-round closures created by berms, rock barricades, or by allowing vegetative growth to obscure the road.

Some roads are closed seasonally by gates or other barriers that allow us to open the road during non-critical periods. This seasonal closure may be to protect elk calving grounds, winter range for deer and elk, other wildlife resources, or for



administrative reasons such as protection of weak subgrades, or providing visitors with non-motorized experiences.

Decommissioning involves permanent removal of the road from the system by removing drainage structures to create more natural drainage patterns, decompacting some roadbeds to restore their capacity to absorb rainfall, blocking the entrance to prevent vehicles from reopening the road, and revegetating the roadbed to prevent runoff and to restore productivity. We account for how much overall decommissioning is done on the Forest, and also how much decommissioning and new construction have been done in each of the designated Key Watersheds on the Forest, in order to ensure there is no increase in road miles in any Key Watershed.

Results: Biological Winter Range (BWR): Road closures are one means of reducing wildlife disturbance in deer and elk winter range. The Forest Plan

Monitoring has shown an increase in the number of previously closed roads being breached in Biological Deer and Elk winter range.

established a goal of reducing open road density to 1.7 miles of open road per square mile within the biological winter range. The current average road density in BWR is 1.73 miles of open road per square mile for the entire Forest. Individual district values for open roads, miles per square mile, are: 1.18 for Mt St. Helens, 1.51 for Mt. Adams, and 2.44 for Cowlitz Valley.

Field monitoring has shown an increase in the number of previously closed roads being breached. Gates and road closure berms are continually being challenged by the public.

Repairs required keeping these road closure devices intact has dropped due to declining budgets. Personnel shortages has also caused difficulties in assuring gates are closed during the restriction periods.

Overall Forest - The projected road closure target for the entire Gifford Pinchot National Forest, as stated in the Forest Plan, is 1,230 miles of road in seasonal or permanent closure, Forest-wide. There are currently 1299 miles prescribed for closure and an estimated 985 miles of road closed by effective year-round closures, or seasonally for BWR or other resource needs. This puts the Forest at 80 percent of the projected goal. In addition, 342 miles of road have been decommissioned since 1994, which includes 143 miles in key watersheds.

Table 18 - Roads in Key Watersheds

KEY WATERSHED	1994 Road Miles	Miles Decommissioned in FY 2004	Miles Decommissioned since 1994	Miles Constr. Since 1994	2004 Road Miles	Net Change Road Miles
Clear Fork Cowlitz	110	0	0	0	110	0
E. Fork Lewis	79	0	3	0	76	-3
Lewis River	737	0	40	0	697	-40
Little White Salmon	133	0	9	1	125	-8
N. Fork Cispus	102	0	4	0	98	-4
Packwood Lake	23	0	0	0	23	0
Siouxon Creek	69	0	0	0	69	0
Upper Cispus	70	0	8	0	62	-8
White Salmon	129	0	19	1	111	-18
Wind River	433	0	60	0	373	-60
Totals	1,885	0	143	2	1,744	-141

Key Watersheds - Table 18 compares current road mileage in the 10 key watersheds on the Forest with mileage at the time the Northwest Forest Plan was implemented in 1994. The Forest is required to maintain or decrease the road mileage in each Key Watershed. As can be seen from Table 18, this objective has been met; there are now 7.5 percent fewer miles of roads in key watersheds on the Forest than there were in 1994. There has been no increase in road mileage in any key watershed in 2004. 19.1 miles of road projects were completed from January – December 2004 (Table 19).

Table 19 - Watershed Activities

Watershed	Road Number	Miles	Activities
Canyon Creek	5400000	0.1	Culvert upgrade at milepost 15.9
Canyon Creek	5400000	0.1	Culvert upgrade at milepost 16.9
East Fork Lewis River	4211000	3.4	Construct waterbars; milepost 0 – 3.4
East Fork Lewis River	4211539	2.2	Construct waterbars and embankment pullback; milepost 0 - 2.2
East Fork Lewis River	4211541	1.8	Construct waterbars and embankment pullback; milepost 0 – 1.8
East Fork Lewis River	4100544	5.0	Construct waterbars and embankment pullback; milepost 0 – 5.0



East Fork Lewis River	4104504	5.8	Construct new waterbars; milepost 0 – 5.8
Wind River	4200000	0.1	Replace Fish Barrier culvert with bridge; milepost 2.4 – 2.5
Wind River	4300000	0.1	Replace Fish Barrier culvert with bridge; milepost 5.0 – 5.1
Little White Salmon River	1800151	0.5	Spot rock surfacing; 28 cubic yards; Oklahoma Campground

Community Effects – Payments to Counties

Introduction: By an act of Congress in 1908, 25 percent of Forest revenues were paid to counties in proportion to the amount of national forest system land in each county. The act stipulated that the money generated be spent on public schools and roads. While this formula worked well for many years, with the dramatic decline in timber harvest over the past decade, an interest arose in decoupling support to rural communities from timber harvest.

The “Secure Rural Schools and Community Self-Determination Act of 2000” provides an alternative system by which counties can choose to receive payments from the federal government for the support of roads and schools. This legislation stabilizes payment levels to their historic high and provides that 15 – 20 percent of the funds may be used for projects on the Forest with advice from local citizens. This legislation authorizes payments through 2006.

The new formula is based on averaging a state’s three highest payments between 1986 through 1999 to arrive at a compensation allotment or “full payment amount.” Communities have the choice to fund restoration projects on federal lands or on county endeavors such as search and rescue, community service work camps or fire prevention. Forest projects must be approved by one of two 15-member Resource Advisory Committees (RAC) comprised of local citizens. The new legislation is slated to guide payment activities through fiscal 2006. Details of the legislation are on the internet at <http://www.fs.fed.us/payments/index.html>.

Over \$16 million were returned to the six counties within the Forest boundary.

Results: Over \$16 million was returned to the six counties with lands in the Forest boundary (Figure 35). Projects on the Forest totaling nearly \$1.3 million were recommended for funding by the RAC and approved by the Forest Supervisor. The current distribution among counties within the Forest boundary is displayed in Table 20.

Table 20 - Community Effects—Payments to Counties

County	Percent Total Distribution	2004 Distribution (\$ Thousand)
Clark	0.1%	15.3
Cowlitz	2.6%	430.0
Klickitat	1.1%	173.7
Lewis	27.3%	4,457.3
Skamania	67.3%	10,991.9
Yakima	1.6%	261.8
Total	100%	16,330

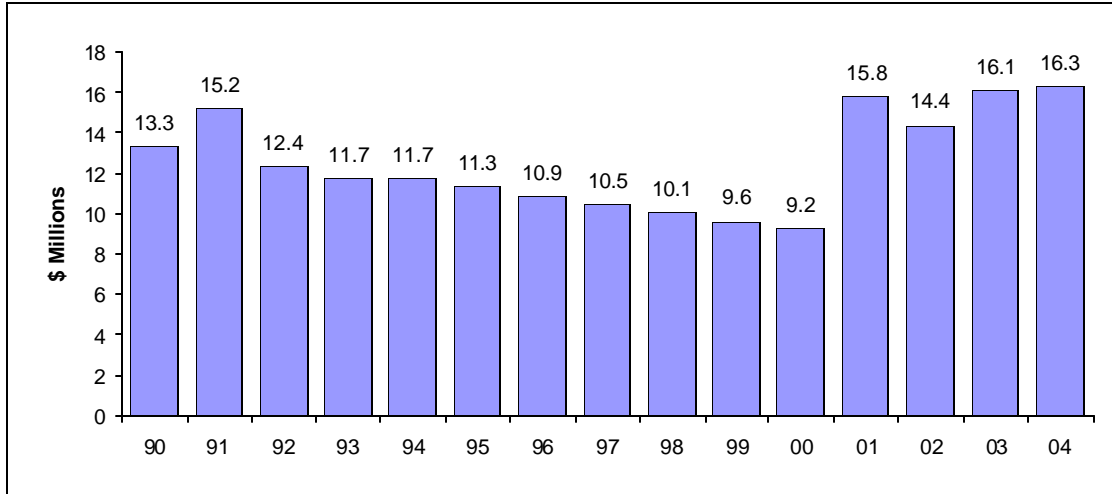


Figure 35 - Payments to Counties

An important Forest Service goal in recent years has focused on helping rural communities adjust to changing federal land management practices and policies. The Forest Service has developed a program designed to provide both financial and technical assistance to natural resource-based communities and rural development organizations striving to diversify and revitalize local economies, and address wildfire hazards. In 2004, the Rural Community Assistance program invested \$224 thousand in the infrastructure of communities surrounding the Forest. Grants to counties in the past eight years are tabulated in Table 21.

Table 21 - Rural Community Assistance Grants

County	1996	1997	1998	1999	2000	2001	2002	2003	2004
Cowlitz	400,200	90,538	2,500	0	86,750	78,000	57,000	70,000	20,000
Klickitat	302,832	227,600	178,700	129,000	117,500	50,000	205,000	0	15,000
Lewis	417,754	223,691	32,000	167,775	76,600	64,800	218,000	50,000	0
Wahkiakum	48,200	28,000	105,000	62,785	98,000	0	0	50,000	0
Clark	23,426	0	0	0	0	20,000	22,000	0	0
Skamania	118,560	192,050	164,000	273,280	111,800	332,600	128,800	34,000	18,000
Yakima	0	0	0	0	0	0	65,000	20,000	20,000
Pierce	7,314	15,000	0	0	0	0	0	0	0
Total \$	1,318,286	776,879	482,200	632,840	490,650	545,400	695,800	224,000	73,000

Mining Operating Plans 91 

Introduction: The Forest Service is charged with making minerals available to the economy, while minimizing the adverse impacts of mining activities on other resources. Mining is unlike other activities on federal lands in that the General Mining Law of 1872 grants the federal land management agencies far less authority over mining activities than over timber harvest, recreation, grazing and other activities. The Forest Service minerals regulations, 36 CFR 228, provide rules to ensure that mining operations be conducted to minimize environmental impacts. These regulations require that a Notice of Intent (NOI) be submitted to the Forest Service District Ranger on the district where the mining is proposed. The operator is required to submit a Plan of Operations (POO) if the District Ranger determines that such operations will likely cause significant disturbance of surface resources. Recreational suction dredgers are required to get hydraulic permits from the state for working in streams and should submit a NOI or POO to the Forest Service prior to working on the district.

The Forest issued 134 permits for mining activities in 2004.



Figure 36 - A placer gold mine during operation in 2003



Photo: Jim Chamberlin

Figure 37 - Reclamation activities with mulching and seeding in 2004

Results: The Forest issued 134 minerals permits, administered 15 Notice of Intent and three Plans of Operations for mining activities. Cowlitz Valley issued 31 permits and administered 13 NOIs, Mount Saint Helens issued 47 permits, administered two NOIs and 2 POOs and Mt. Adams issued 56 permits and had 1 POO.

Table 22 - Permits Administered

Permit	2000	2001	2002	2003	2004
Minerals	137	127	125	107	134
NOIs	24	23	23	25	15
Plans of Operation	2	3	2	4	3

Most of the mineral permits involved salable (common variety) mineral resources. The permits issued were for a total of 2,100 cubic yards for a cost of \$19,856. Most of the yardage and cost recovered came from six commercial permits issued on Mt. Adams District. These permits were issued for either building material (as flat, platy flagstone-type rock), construction material (used for fill, road rock or similar use) or landscaping material (for decorative uses). The Forest provided about 100 cubic yards of crushed aggregate to a local fire district for construction of a new staging area for their fire truck.

Use of rock on the forest for construction projects amounted to about 2,100 cubic yards. About 500 cubic yards were used for surface rock repair work. The rest was used as pit-run material for various embankment repairs and culvert replacements.



Suction Dredging - The required hydraulic permits limit mining activity and its timing, based on guidelines set up in a state publication titled Gold and Fish. This publication contains rules and regulations for mineral prospecting and placer mining in Washington State (WDFW Publication GF-1-99). This year the Forest had 17 NOIs for suction dredging. Two were on Copper Creek, a tributary of the East Fork Lewis River on the Mount St. Helens National Volcanic Monument. The rest were located on the Cowlitz Valley Ranger District in Yellowjacket and McCoy creeks and various tributaries of this system. There is some concern that Gold and Fish allows suction dredging that has the potential to adversely impact anadromous fish spawning gravels. New regulations that will change the timing of mining are in progress and will be reflected in Gold and Fish. New dates have been established but a new version of Gold and Fish has not yet been published.

It appears the effects of suction dredging to the aquatic ecosystem are negligible.

Monitoring has shown that very little activity occurs during the week and that most mining activity probably takes place on weekends.

Evaluation: Standards and guidelines were met.

Recommended Action: Continue having the state notify the Forest of applicants for hydraulic permits on the Forest. The dredgers should also be providing Notices of Intent to each district where they plan on working.

Working closer with miners to ensure they provide better information on their Plan of Operations may reduce the time needed to review and provide a decision.

Recreational suction dredging needs to be monitored on the weekends when most of the activity occurs. Some activity has been observed on the East Fork Lewis River that may not be providing Notices of Intent.



E. Accomplishments

Table 23 compares program accomplishments for FY's 2000 - 2004:

Table 23 - Program Accomplishments

Output	Units	Outputs					
		2000	2001	2002	2003	2004	2004 Target
Developed and Dispersed Recreation Visits**	Thousand Visits	N/A	N/A	1,787	N/A	N/A	*
Wilderness Use	Thousand Visits	69.6	69.9	56.2	59.9	50.5	*
Trail Const/Recon.	Miles	1.7	6.7	12.5	5.6	1.2	*
Trails Maintained	Miles	76.8	819	927	510	873	
Wildlife Habitat Improvement:	Acres	849	765	650	382	148	148
Wildlife Indicator Species:							
• Deer	Habitat Capability	17,850	17,750	17,650	16,000	16,000	*
• Elk	Animals	4,450	4,410	4,370	3,500	3,500	*
• Mountain Goat	Animals	290	290	290	290	290	*
• Net Sell Volume	MCF	260	400	273	3,695	3,228	3,250
	MMBF	1.3	2	1.4	18.5	17.0	16.9
• Volume Harvested	MMBF	17.8	9.4	1.7	4.8	12.1	*
• Reforestation	Acres	891	552	334	211	2	
• Fuel Wood	MCF	178	306	273	311	163	*
• Precommercial Thin	Acres	2,012	6,027	2,944	3,918	2,732	1,164
• Release	Acres	14	55	45	0	63	*
• Fertilization	Acres	0	0	0	0	295	*
Grazing	AUMs	816	458	458	553		*
Watershed Improvement	Acres	77	318	108	87	27	26
Instream Restoration	Miles	7.1	8.75	9	5	5	5
Air Quality	Particulate Tons	85.1	51.7	152.8	5.7		*
Fuel Treatment	Acres	15	518	449	92		
Timber Purchaser Roads:							
• Construction	Miles	0	0	0	0	0	*
• Reconstruction	Miles	0	0	0	0	0	*
Allocated Funding (Roads):							
• Construction	Miles	0	0	0	0	0	*
• Reconstruction	Miles	31.7	10.5	21	0	0.4	*
• Decommissioning	Miles	72.3	8.6	2.2	0	5.0	*
Roads Open to**:							
• Passenger Cars	Miles	833	821	819	820.2	820.2	*
• High Clearance	Miles	2,631	2,583	2,627	2,637	2,632	*
Roads Closed	Miles	600	658	668	669	669	*
Total Road System	Miles	4,064	4,061	4,115	4,127	4,122	*
Returns to Govt.	\$ Million	4.8	3.5	3.3		2.0	*
Payments to Counties	\$ Million	9.2	15.8	14.4	16.1	16.3	*
Landlines:							
• Located	Annual Mi.	2	5	2	2	4	6
• Maintained	Annual Mi.	5	5	5	5	5	
Congressionally Designated Boundaries	Miles	3	1	2	0	0	*
Total Expenditures	\$ Million	24	36	20	17	22	*

* No targets for these items.

** Monitored every 5th year.

F. Expenditures

The budget for the Gifford Pinchot National Forest is an outcome of the annual congressional appropriations process. Congress allocates an annual budget for the Forest Service that is subsequently disaggregated to the nine Forest Service Regions. Forest Service Regional Offices then allocate the Regional budget among Forests in each Region. Budgets are not related to receipts from timber sales or most other activities on the Forest. Eighty percent of the user fees collected on the MSHNVM are kept on the Forest for use in maintaining recreation facilities. Collections from the NW Forest Pass program funds are used to improve maintenance of low development level campgrounds and dispersed camping areas. Since 2002, the Forest has had access to over a million dollars of Title II funds under the Secure Rural Schools Act for road and trail maintenance and watershed restoration projects.

The Forest spent about \$17 million in 2003, less than half the budget of 10 years ago.

Figure 38 displays expenditures on the Gifford Pinchot National Forest over the last 10 years. Expenditures were buoyed in 2001 by \$9 million dollars in land acquisitions and over \$2 million spent suppressing the Salt Creek Fire on Mt. Adams.

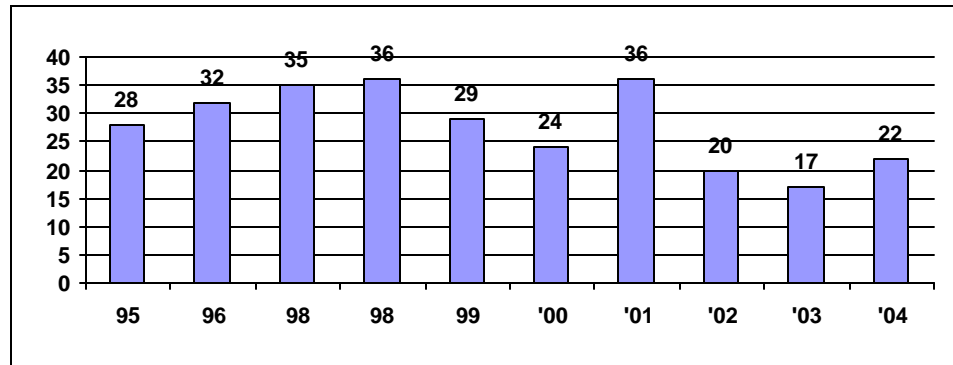


Figure 38 - Total Expenditures 1995-2004

Figure 39 shows the composition of 2003 and 2004 expenditures by program area. The “Other” category includes costs for fleet, computers, human resource programs, Title II county payments, and land management planning.

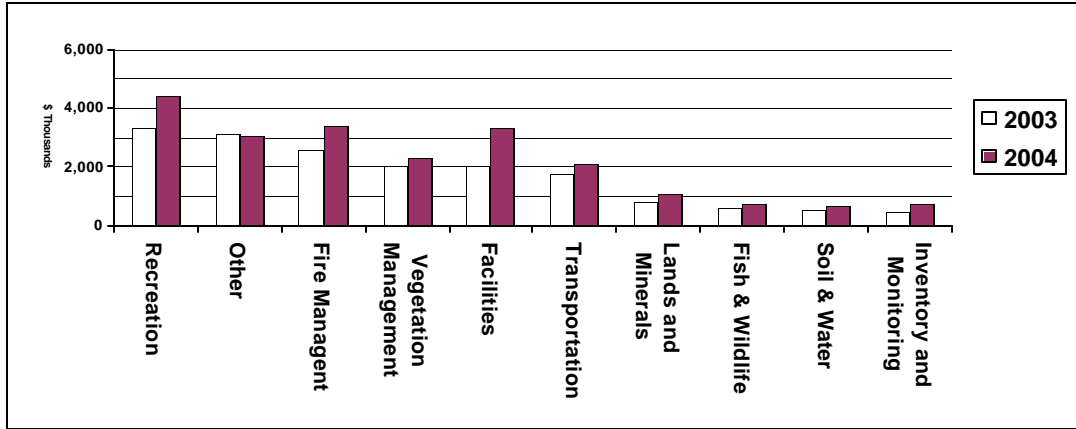


Figure 39 - 2004 Expenditures by Program

G. Forest Plan Amendments

There are 15 approved amendments to the Forest Plan (Table 24).

Table 24 - List of Forest Plan Amendments

Amendment No.	Approved	Description
1	5/1/91	Decision Memo - Adds Pacific Yew to the list of Acceptable Species in all working groups.
2	9/24/91	Decision Memo - Provides additional direction for visual resource management and mineral claims and leases in Wild River corridors.
3	9/24/91	Decision Memo - Clarified the lower terminus of the Cispus River Wild and Scenic River recommendation in the Forest Plan documents so that it coincided with the Federal Energy Regulatory Commission license boundary of the Cowlitz Falls Hydroelectric Project.
4	9/24/91	Decision Memo - Adds Bigleaf Maple as an Acceptable Species in the Western Hemlock Working Group.
5	9/24/91	Decision Memo - Includes monitoring criteria for the goldeneye and wood duck.
6	8/12/92	Decision Memo - Adds a section on Managing Noxious Weeds and Unwanted Vegetation to the Forest Plan.
7	11/24/92	Decision Notice - Opens Blue Horse Trail 237 to winter motorized use (snowmobiles).
8	3/3/93	Decision Memo - Modifies boundaries of the Forest Plan Map of Record.
9	12/13/93	Decision Notice - Allows grazing in enclosure area of the Cave Creek Wildlife Special Area.
10	7/08/94	Decision Memo - Allows grazing in the Grand Wildlife Special Area, a great blue heron rookery.

Table 24 - List of Forest Plan Amendments

Amendment No.	Approved	Description
		Wildlife Special Area, a great blue heron rookery.
11	4/13/94	Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl. Subsequent documentation reconciles Forest-wide and Management Area Standards and Guidelines and the Forest Plan Map with the Record of Decision for the President's Plan. Replaces Forest Plan pages IV-45 through IV-150.
12	5/29/98	Decision Notice – Established the Monte Cristo RNA
13	9/30/98	Record of Decision - White Pass Ski Area Expansion Amends the GP Forest Plan and Northwest Forest Plan to authorize construction of approximately 0.25 miles of road. The ROD and this amendment were invalidated in September 2000 by a court ruling in Northwest Ecosystem Alliance, Hogback Basin Preservation Assn, and Washington Wilderness Coalition v. U.S. Forest Service, et al. A new proposal is being studied.
14	4/19/99	Decision Notice - Amends wilderness management standards and guidelines, particularly those related to determining limits of acceptable change.
15	4/30/01	Decision Notice – Amends standards and guidelines forbidding new road construction in a portion of a roaded recreation management area to allow construction of 400 feet of road to access campsites that were relocated away from a riparian reserve.



H. Other Monitoring Activities

The Forest routinely conducts a wide range of monitoring activities that are not directly linked to the Forest Plan. Examples of these monitoring activities, which we conduct to evaluate the effectiveness of resource program management and trends in the resources, are briefly described in this section.

Whitebark Pine Surveys

Whitebark pine is a species generally found at high elevations on the Gifford Pinchot National Forest. The largest populations occur around the flanks of Mount Adams with additional patches near the Cascade Crest. While not a tree that is generally considered for commodities, it is a very important species for a variety of wildlife species as well as for playing an important role in snow accumulation at high elevations. Populations on the Gifford Pinchot are often isolated and disjunct from the main species distribution, possibly containing unique genetic variation due to genetic drift and/or different selection pressures.

In the past few years, there has been increasing concern over the decline of this species throughout the west. The reasons for this decline are varied but include white pine blister rust (*Cronartium ribicola*) (Figure 40), fire suppression and, more recently, increased mortality from mountain pine beetle. The impact to western white pine from these factors has been significant in some places.



Figure 40 - Blister rust on a whitebark pine seedling



Figure 41 - Recent whitebark pine mortality

The Forest received funding in 2004 to complete surveys regarding the status of whitebark pine on the Forest. This survey covered the area around Mount Adams and collected information regarding blister rust, root rot and overall mortality (Figure 41). Preliminary results are summarized in Table 25 below:

Table 25 - Preliminary Whitebark Pine Survey Results

Description Surveyed	Results
Number of Sites surveyed	11
Number of Surveys conducted	14
Site elevations range	5600 feet to 6600 feet
Number of trees observed	870
Blister Rust incidence (mean)	52.8%
Blister Rust Range in plots	9.7% to 100%
Mountain Pine Beetle Incidence	0.0%
Overall Mortality (mean)	7.6%
Overall Mortality (range)	0.0-29.4%

Overall, mortality on the Forest is relatively low; however, 50 percent of the plots had some mortality related to blister rust. Some areas had significant blister rust mortality, which seriously threatens some populations in this area. Many of these populations are located in remote areas that are difficult to access (such as wilderness areas). This makes pruning, planting, thinning, and other pest management activities difficult and expensive to implement. These surveys will be used to target restoration activities. It is important that the Forest continue to monitor these populations over time to ensure this important component of the ecosystem is maintained.



Forest Health (Insects and Disease Monitoring)

Insects, disease, and other biotic organisms play a major role in the overall development of the vegetation on the forested landscapes of the Gifford Pinchot National Forest. They also play an important role in monitoring overall forest health. From one aspect, insect and disease provides an important function on our landscape by being a part of the overall diversity, as well as being an important component that creates additional diversity in our landscapes. For example, they are important in the development of snags and down wood, create small and sometimes large gaps, and affect the type and amount of tree species that can occupy a site. From another aspect if vegetative conditions are created such that forest stands are under significant stress these insects can cause significant mortality and lead to large-scale mortality that can lead to severe fires.

Overall, the forest at this point is healthy with regard to insect and disease. The majority of insects and disease are at endemic levels and are actively creating snags, downwood, and providing other functions to the landscape. One area, just south of Mount Adams continues to be a concern regarding forest health. Many believe that the major factor causing mortality in this area is western spruce budworm. However, looking closer at this area, we find that budworm is only one factor causing this mortality. There is actually a complex of insects and diseases in addition to western spruce budworm that is acting on this system. Native root rots and bark beetles, in addition to the budworm, are acting to cause mortality in this area. In addition, a species of insect from Europe, the balsam woolly adelgid (*Adelges piceae*) is causing mortality in this area. This complex is acting on a landscape that has high stocking and a species composition that is outside the natural range of variability and under stress. Monitoring of insect and disease is the key to identifying areas of concern with regard to forested vegetation. Monitoring will be followed by treatment where needed.

For a number of years Region 6 of the Forest Service (Washington and Oregon) has been monitoring the forested landscapes of not only the Gifford Pinchot but also the rest of Oregon and Washington. They monitor through an aerial survey that is conducted annually from July to September, and identifies and maps the location and general size and effect of various insects, disease and animal damage, such as bear. While not statistically accurate it is an excellent for monitoring the trends in organisms that are affecting the landscape. The following charts show the trends of the major forest insects and bear that have had effects on the Forest.

Bark Beetle Activity

Bark beetle activity on the Forest was up in 2004 on the Forest and at the highest level since 2000 (Figure 42). Warm dry conditions may have had an effect on the overall amounts of activity that the Forest experienced.

Fir engraver (*Scolytus ventralis* LeConte) was the predominant insect acting on the landscape (approximately 11,000 acres in 2004) with the majority of damage and mortality noted in and around the Gotchen. This area is located just south of Mount Adams. However, scattered patches were noted throughout the Forest. The

Gotchen area continues to be a concern for the Forest not only for the fir engraver but also for the western spruce budworm and a host of other insect and diseases that are acting as a complex in this area. Treatments in the Gotchen area are designed to restore forest stand resiliency, promote species diversity thus reduce the level of impact of insect and disease.

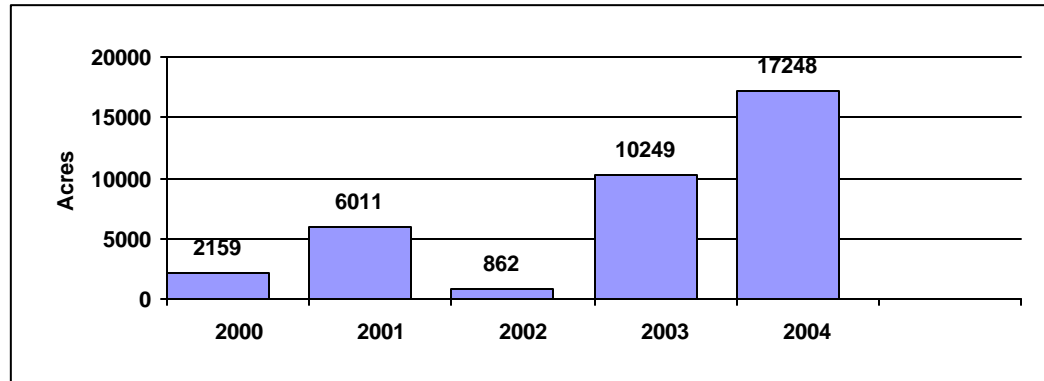


Figure 42 - Acres of bark beetle activity 2000-2004

Trends in Douglas-fir beetle (*Dendroctonus psuedotsugae*) were down significantly from 2003 with only about 1000 acres affected in 2004. This insect is acting endemically on the landscape and continues to contribute to the development of snags and down wood throughout the Forest.

Western Spruce Budworm

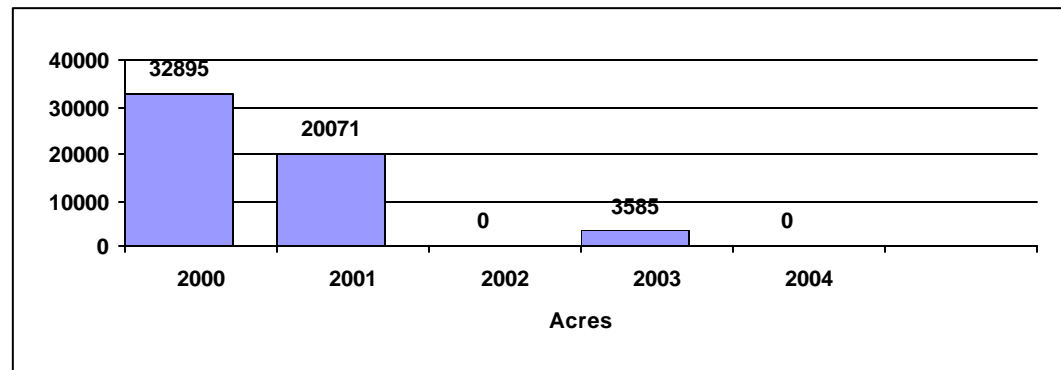


Figure 43 - Acres of western spruce budworm infestation.



Defoliation from western spruce budworm declined to very low levels in 2004 (Figure 43). A variety of factors may be causing this decline including lack of new foliage and climate factors. The Gotchen area continues to be a focus area for reducing the potential for significant mortality from this insect as well as a complex of other insects and diseases. While other portions of the Forest have received light defoliation on occasion, this insect continues to be mainly a concern in the Grand Fir/Ponderosa pine types on the Forest, which occur mainly in the southeast portion of the Forest.

Bear Damage

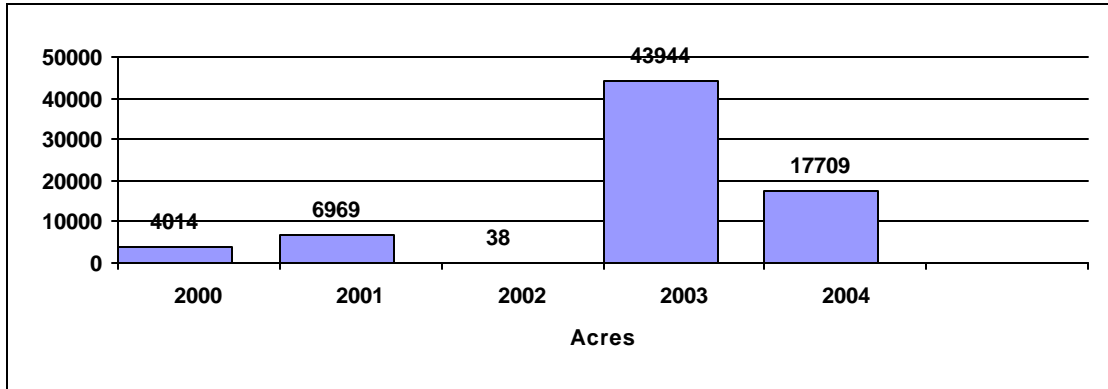


Figure 44 - Acres of Bear Damage

Damage from Black Bear was down in 2004 (Figure 44) but continues to be causing light to moderate damage to a number of plantations on the Forest. In the spring, before other food sources become available, black bears will claw off the outer bark and feed on the inner bark. They also claw off the outer bark to leave territorial markings. Generally, on the Forest this is a tree that is between 20 and 40 years old and 8 to 20 inches in diameter. While significant in some plantations on the Forest, generally the damage is not significant.

Laminated Root Rot

Laminated root rot continues to be the most significant disease on the Forest. In general, it is most prevalent in and around the Cowlitz Valley Ranger district. It is especially a concern in areas where it occurs adjacent to roads, within campgrounds and near structures. Work continues to identify and treat these areas as well as to minimize its impact in areas where Douglas-fir is the dominant tree species.

I. Glossary

A

Anadromous fish - Those species of fish that mature in the sea and migrate into streams to spawn. Salmon, steelhead, and searun cutthroat trout are examples.

B

Big game - Large mammals hunted for sport. On the National Forest, these include animals such as deer, elk, antelope, and bear.

Big game winter range - A range, usually at lower elevation, used by migratory deer and elk during the winter months; usually more clearly defined and smaller than summer ranges.

Board Foot = a piece of wood 12 inches wide by 12 inches long by one inch in width

MBF= 1000 Board Feet, approximately 1.94 CCF
depending on growing site

CCF= 100 Cubic Feet

MCF= 1000 Cubic feet = 10 CCF

1 MCF= 8 cords of wood

C

Cavity - The hollow excavated in trees by birds or other natural phenomena; used for roosting, food storage, and reproduction by many birds and mammals.

Ceded lands - Lands surrendered to the federal government by treaty.

CF (cubic foot) - The amount of timber equivalent to a piece of wood one foot by one foot by one foot.

Cord of firewood - a stack of wood 4 feet high by four feet wide by 8 feet long=1.28 CCF or 128 cubic feet -- which includes the air space between pieces of wood.

Creel - A wicker basket used by anglers to carry fish.

Cultural resource – Also Heritage Resource the remains of sites, structures, or objects used by humans in the past-historic or prehistoric.



Cumulative effects - Those effects on the environment that result from the incremental effect of the action when added to the past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other action. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

D

Diameter at breast height (d.b.h.) - The diameter of a tree measured 4 feet 6 inches above the ground.

Dispersed recreation - A general term referring to recreation use outside developed recreation sites; this includes activities such as scenic driving, hiking, backpacking, hunting, fishing, snowmobiling, horseback riding, cross-country skiing, and recreation in primitive environments.

E

Endangered species - Any species of animal or plant that is in danger of extinction throughout all or a significant portion of its range. Plant or animal species identified by the Secretary of the Interior as endangered in accordance with the 1973 Endangered Species Act.

F

Forage - All browse and nonwoody plants that are available to livestock or game animals and used for grazing or harvested for feeding.

Fringed pinesap - A sensitive plant species.

K

Knutson-Vandenberg (K-V) - Legislation authorizing the collection of money from timber sales receipts for reforestation, stand improvement or mitigation projects on timber sale areas.

M

Management Area - Provides direction and practices for specific portions of the Forest. Each Management Area identifies a goal, or management emphasis, and the desired future condition of the land. Each MAC includes one or more Management Prescriptions.

Management indicator species - A species selected because its welfare is presumed to be an indicator of the welfare of other species using the same habitat. A species whose condition can be used to assess the impacts of management actions on a particular area.

Mass movement - A general term for any of the variety of processes by which large masses of earth material are moved downslope by gravitational forces - either slowly or quickly.

Meaningful Measures - A recreation management process to better guide recreation management activities at the project and site level intended to provide quality service to recreation visitors. It includes standards of quality, as well as prioritization for work to be accomplished based on documented expectations, needs, visitor preference and resource condition. Examples of standards for trail maintenance include: trees removed, tread maintained and brush cleared to predetermined widths.

MMBF - Million board feet

MMCF - Million cubic feet

MRVDs (Thousand recreation visitor days) - A measure of recreation use, in which one RVD equals twelve visitor hours, which may be aggregated continuously, intermittently, or simultaneously by one or more persons.

N

National Environmental Policy Act of 1969 (NEPA) - An Act to declare a National policy which will encourage productive and enjoyable harmony between humankind and the environment, to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity, to enrich the understanding of the ecological systems and natural resources important to the nation, and to establish a Council on Environmental Quality. (The Principle Laws Relating to Forest Service Activities, Agriculture Handbook No. 453, USDA, Forest Service, 359 pp.)

Northwest Forest Plan (NWFP) - An amendment to westside Forest Plans intended to ensure viability of the spotted owl and other late-successional dependent species, and maintenance and restoration of healthy riparian ecosystems.



O

Optimal Cover - For elk, cover used to hide from predators and avoid disturbances, including humans. It consists of a forest stand with four layers and an overstory canopy that can intercept and hold a substantial amount of snow, yet has dispersed, small openings. It is generally achieved when the dominant trees average 21 inches diameter at breast height or greater and have 70 percent or greater crown closure.

ORV - Off Road Vehicle. A category of recreational vehicles that includes four-wheel-drive vehicles and trail bikes.

Owl Region - National Forests and BLM districts within the range of the northern spotted owl.

P

Partial Retention - Management activities remain visually subordinate to the characteristic landscape.

PC (Precommercial) thinning - The practice of removing some of the trees less than marketable size from a stand so that the remaining trees will grow faster.

R

Raptor - Predatory birds, such as falcons, hawks, eagles, and owls.

Redd - Depressions in gravel in streams where salmon, steelhead, and trout lay their eggs.

Riparian - Pertaining to areas of land directly influenced by water. Riparian areas usually have visible vegetative or physical characteristics reflecting this water influence. Streamsides, lake borders, or marshes are typical riparian areas.

S

Selection - The annual or periodic removal of trees (particularly mature trees), individually or in small groups, from an uneven-aged forest, to realize the yield and establish a new crop of irregular constitution.

Semi-primitive motorized - A classification of the Recreation Opportunity Spectrum, characterized by a predominantly unmodified natural environment in a location that provides good to moderate isolation from sights and sounds of people, except for those facilities/travel routes sufficient to support motorized recreational travel



opportunities which present at least moderate challenge, risk, and a high degree of skill testing.

Semi-primitive non-motorized - A classification of the Recreation Opportunity Spectrum, characterized by a predominately unmodified natural environment of a size and location that provides a good to moderate opportunity for isolation from sights and sounds of people. The area is large enough to permit overnight foot travel within the area, and presents opportunity for interaction with the natural environment with moderate challenge, risk, and use of a high degree of outdoor skills.

Sensitive species - Plant or animal species that are susceptible or vulnerable to activity impacts or habitat alterations. Those species that have appeared in the Federal Register as proposed for classification or are under consideration for official listing as endangered or threatened species, that are on an official State list, or that are recognized by the Regional Forester as needing special management to prevent placement on Federal or State lists.

Seral - Transitory stage in an ecological succession.

Shelterwood - A regeneration method under an even-aged silvicultural system. A portion of the mature stand is retained as a source of seed and/or protection during the period of regeneration. The mature stand is removed in two or more cuttings.

Silviculture - The art and science of controlling the establishment, composition, and growth of forests.

Snag - A standing dead tree.

Soil productivity - The capacity of a soil to produce a specific crop such as fiber or forage under defined levels of management. Productivity is generally dependent on available soil moisture and nutrients, and length of growing season.

Special Interest Areas - Areas managed to make recreation opportunities available for the understanding of the earth and its geological, historical, archeological, botanical, and memorial features.

T

TE&S - Threatened, endangered and sensitive species.

Threshold of Concern - Degree of departure from a standard and guideline that would trigger an analysis to determine if a change in practices or plan adjustment is needed.

Threatened species - Those plant or animal species likely to become endangered species throughout all or a significant portion of their range within the foreseeable future. (See also Endangered species.)

**Appendix: Water Temperature Monitoring Data****Upper Cispus River Watershed**

Stream Name	Monitoring location	Maximum temp. in 2004 (oC)	Maximum 7-day average temp. in 2004 (oC)	Years monitored	Years temp. exceeded Maximum 7-day average of 16.00c (#)	Highest Maximum 7-day average temp. (oC) during monitoring period (Year)
Walupt Creek	At inlet to Walupt Lake	11.8	11.2	2002,2004	0	11.2 (2004)
Walupt Creek	At outlet to Walupt Lake	23.7	22.7	2001-2004	4	22.7 (2003, 2004)
Walupt Creek	At confluence w/Cispus R	*	*	2001-2002	2	20.5 (2001)
Cispus River	At Walupt Ck Confluence	*	*	2002	0	13.3 (2002)
Cispus River	Above Muddy Fork confluence	*	*	2000,2003	0	13.7 (2003)
Chambers Creek	Above Rd. 2160	*	*	1994,1995, 2000,2003	1	16.0 (1994)
East Canyon Creek	About 5 miles above confluence w/ Cispus R	17.1	16.9	1994,2003, 2004	2	16.2 (2004)
East Canyon Creek	About 1 mile from Cispus R. confluence	17.6	17.1	1994-97 1999-2004	6	17.9 (1994)
North Fork Cispus River	Near confluence w/ Cispus R	16.5	16.0	1991-95 1997-2004	1	16.2 (2003)
Cispus River	Above North Fork Cispus confluence	16.4	15.9	1994,2000, 2003-2004	0	15.9 (2004)
Cispus River	At river mile 23	*	*	2003	0	14.0 (2003)
* Data not collected in 2004.						
Bold denotes site exceeded temperature standard during 2004.						

Lower Cispus River Watershed

Stream Name	Monitoring location	Maximum temp. in 2004 (oC)	Maximum 7-day average temp. in 2004 (oC)	Years monitored	Years temp. exceeded Maximum 7-day average of 16.0oC (#)	Highest Maximum 7-day average temp. (oC) during monitoring period (Year)
Yellowjacket Creek	2.5 miles above confluence w/Pinto Creek	*	*	1992,1994, 1995,1997	0	13.7 (1992)
Pumice Creek	At confluence w/Yellowjacket Creek	16.3	15.8	2001-2004	1	16.2 (2001)
Pinto Creek	At confluence w/Yellowjacket Creek	*	*	2001-2003	0	15.2 (2001)
Yellowjacket Creek	Above McCoy Creek	16.4	16.1	2001,2003-2004	1	16.1 (2004)
Yellowjacket Creek	At confluence w/ Cispus R	20.4	19.4	1996,1999-2004	6	19.4 (2004)
1918 Creek	Unknown	6.5	6.3	2004	0	6.3 (2004)
1918 Creek	At Greenhorn Ck confluence	20.2	18.8	2001-2004	4	19.0 (2001)
Greenhorn Creek	Above 1918 Ck.	*	*	2001, 2003	1	16.8 (2003)
Greenhorn Creek	At confluence w/Cispus R	19.9	18.9	2000-2004	5	19.9 (2004)
Ferrous Creek	Near Iron Ck. Confluence	15.4	14.6	1995,1999, 2004		14.6 (2004)
Iron Creek	Above Big Ck.	*	*	1999,2001	0	13.2 (2001)
Big Creek	Near Iron Ck. Confluence	14.3	13.8	1999,2001, 2004	0	13.8 (2004)
Iron Creek	At river mile 0.9	17.0	16.3	2001,2003-2004	2	16.5 (2003)
Iron Creek	At confluence w/ Cispus R	18.8	18.0	1996,1999-2004	6	18.4 (2003)
Cispus River	4.5 miles above Quartz Creek	18.5	17.8	1999-2004	5	18.3 (2003)
Quartz Creek	About 1 mile from Cispus R.	*	*	2000-2003	1	16.8 (2003)
Woods Creek	About 1 mile from Cispus R. confluence	18.0	17.1	1999,2003-2004	2	18.1 (2003)
Woods Creek	About 3.7 miles from Cispus R confluence	20.3	19.6	2003, 2004	2	19.6 (2003)

* Data not collected in 2004.
 Bold denotes site exceeded temperature standard during 2004.



Middle Cowlitz River Watershed

Stream Name	Monitoring location	Maximum temp. in 2004 (oC)	Maximum 7-day average temp. in 2004 (oC)	Years monitored	Years temp. exceeded Maximum 7-day average of 16.0oC (#)	Highest Maximum 7-day average temp. (oC) during monitoring period (Year)
North Fork Willame Creek	At confluence w/ West Fork Willame Creek	*	*	1978, 1983-1987, 1996, 1998-2003	0	15.9 (1996)
West Fork Willame Creek	At confluence w/ Willame Ck.	*	*	1996,1998	0	13.8 (1996)
Lillian Creek	At confluence w/ Willame Ck.	*	*	1998-2003	0	16.1 (1998)
South Fork Willame Creek	About 1 mile above Willame Creek	*	*	1975-1978, 1980-1988, 1994	0	14.2 (1994)
South Fork Willame Creek	At confluence w/ Willame Ck.	*	*	1998, 2000-2002	0	15.6 (1998)
Willame Creek	At road 4715	*	*	2003	0	13.3 (2003)
Willame Creek	0.5 mile above confluence w/ Cowlitz R	16.2	15.9	1999-2004	0	15.9 (2001,2004)
Davis Creek	About 2 mile from Cowlitz R. confluence	17.2	16.8	2001-2004	1	16.8 (2004)
Silver Creek	About 2.5 miles above Lynx Ck	12.5	12.1	1995-1997, 2004	0	12.1 (2004)
Lynx Creek	Near confluence with Silver Ck	17.8	17.1	1999, 2003-2004	3	18.3 (2003)
Silver Creek	Below Lake Ck. confluence	16.4	15.8	1999,2001, 2003-2004	0	16.0 (2001,2003)
Lake Creek	Near confluence with Silver Ck	17.0	16.4	1999, 2003-2004	3	16.9 (2003)

Stream Name	Monitoring location	Maximum temp. in 2004 (oC)	Maximum 7-day average temp. in 2004 (oC)	Years monitored	Years temp. exceeded Maximum 7-day average of 16.0oC (#)	Highest Maximum 7-day average temp. (oC) during monitoring period (Year)
Silver Creek	About 1 mile from Cowlitz R. confluence	17.8	17.3	1992, 1995, 1997-2004	10	18.3 (1998)
Siler Creek	About 2.5 miles from Cowlitz R.	16.7	16.0	1996,2002,2004	0	16.0 (2004)
* Data not collected in 2004. Bold denotes site exceeded temperature standard during 2004.						



Upper Nisqually River Watershed

Stream Name	Monitoring location	Maximum temp. in 2004 (oC)	Maximum 7-day average temp. in 2004 (oC)	Years monitored	Years temp. exceeded Maximum 7-day average of 16.0oC (#)	Highest Maximum 7-day average temp. (oC) during monitoring period (Year)
Big Creek (Nisqually R trib)	About 3.5 miles above Catt Ck.	13.7	13.3	1997,2002, 2004	0	14.6 (2002)
Berry Creek (Nisqually R trib)	Near confluence w/ Little Nisqually R	15.6	15.0	1997, 2003,2004	0	15.2 (2003)
Copper Creek	0.2 miles from confluence w/ Little Nisqually	13.5	13.1	1997, 2003,2004	0	13.1 (2004)
Catt Creek (Big Ck trib)	About 3 miles above Big Ck. confluence	16.8	16.1	1996,1999, 2001-2004	5	17.1 (2003)
Catt Creek (Big Ck trib)	At 85 road crossing	*	*	2000, 2003	0	12.5 (2000)
South Catt Creek	About river mile 0.3	*	*	2000, 2003	2	14.8 (2003)
East Creek (Nisqually R trib)	About 4.5 miles above Nisqually R.	17.6	17.1	2002-2004	3	19.0 (2003)
West Fork Little Nisqually River	At confluence w/Lake Ck.	19.1	18.6	2002, 2004	2	18.6 (2004)
Winston Creek (West Fork Little Nisqually R trib)	At confluence w/Little Nisqually R	13.9	13.6	2003, 2004	0	13.6 (2004)
West Fork Little Nisqually River	At confluence w/Winston Ck.	18.6	17.7	2002-2004	3	18.1 (2002)
Hiawatha Creek (Little Nisqually R trib)	At confluence w/Little Nisqually R	16.4	15.8	2001-2004	0	16.0 (2003)
West Fork Little Nisqually River	At confluence w/Hiawatha Ck.	*	*	2003	1	16.1 (2003)
Spencer Creek (Little Nisqually R trib)	At confluence w/Little Nisqually R	14.6	14.1	2002-2004	0	14.1 (2004)
Little Nisqually River	At confluence w/Wildcat Ck.	*	*	2002-2003	2	17.3 (2003)
Wildcat Creek	At confluence w/Little Nisqually R	16.1	15.4	2002-2004	0	14.7 (2002)

*Data not collected in 2004.
Bold denotes site exceeded temperature standard during 2004.

Tilton River Watershed

Stream Name	Monitoring location	Maximum temp. in 2004 (oC)	Maximum 7-day average temp. in 2004 (oC)	Years monitored	Years temp. exceeded Maximum 7-day average of 16.0oC (#)	Highest Maximum 7-day average temp. (oC) during monitoring period (Year)
Tumble Creek	Near confl. w/ Wallanding Ck	15.9	15.4	1995, 1996, 1999-2004	3	16.4 (1996)

Clear Fork Cowlitz Watershed

Stream Name	Monitoring location	Maximum temp. in 2004 (oC)	Maximum 7-day average temp. in 2004 (oC)	Years monitored	Years temp. exceeded Maximum 7-day average of 16.0oC (#)	Highest Maximum 7-day average temp. (oC) during monitoring period (Year)
Tumble Creek	Near confl. w/ Wallanding Ck	15.9	15.4	1995, 1996, 1999-2004	3	16.4 (1996)

Muddy River Watershed

Stream Name	Monitoring location	Maximum temp. in 2004 (oC)	Maximum 7-day average temp. in 2004 (oC)	Years monitored	Years temp. exceeded Maximum 7-day average of 16.0oC (#)	Highest Maximum 7-day average temp. (oC) during monitoring period (Year)
Clearwater Creek	8 miles above Muddy River	18.6	18.0	1996-1999 2001-2004	6	18.2 (1998)
Muddy River	Above Clear Creek	20.8	19.9	1996-2004	9	21.9 (1996)
Clear Creek	Near confluence w/ Muddy River	18.3	18.0	1997-2004	8	18.0 (1998,2004)
Muddy River	Below Clear Ck confluence	*	*	2001-2003	3	21.1 (2001)
Pine Creek	0.5 Mi. above Lewis River	14.9	14.5	2002-2004	0	14.7 (2003)

**Lewis River Watershed**

Stream Name	Monitoring location	Maximum temp. in 2004 (oC)	Maximum 7-day average temp. in 2004 (oC)	Years monitored	Years temp. exceeded Maximum 7-day average of 16.0oC (#)	Highest Maximum 7-day average temp. (oC) during monitoring period (Year)
Lewis River**	Above Quartz Creek	15.0	14.6	1999-2004	0	15.4 (2001)
Quartz Creek	Above Platinum Creek	18.9	18.3	2000-2004	4	18.3 (2004)
Quartz Creek	Below Platinum Creek	19.0	17.7	1997-2004	6	18.0 (2003)
Alec Creek		15.4	15.4	2000, 2003-2004	0	15.4 (2004)
Lewis River	Above Cussed Hollow Creek	*	*	1996-1997	1	17.0 (1996)
Lewis River**	Below Cussed Hollow Creek	18.2	17.8	1998-1999 2002-2004	3	18.1 (2003)
Lewis River**	Above Big Creek	18.1	17.8	2001-2004	4	18.5 (2001)
Rush Creek	Above Meadows Creek	*	*	1996,1999-2000, 2003	0	14.7 (1996)
Lewis River	Below Rush Creek	*	*	1997	1	18.8 (1997)
Lewis River**	Above Curly Creek	16.9	16.2	1997-2000 2002-2004	6	19.3 (1998)

*Data not collected in 2004.

Bold denotes site exceeded temperature standard during 2004.

East Fork Lewis River

Stream Name	Monitoring location	Maximum temp. in 2004 (oC)	Maximum 7-day average temp. in 2004 (oC)	Years monitored	Years temp. exceeded Maximum 7-day average of 16.0oC (#)	Highest Maximum 7-day average temp. (oC) during monitoring period (Year)
East Fork Lewis River	Above Green Fork	18.2	17.6	1999-2004	5	17.6 (2004)
Green Fork	1 mile above East Fork	15.7	15.3	1996-1999 2001-2004	0	15.7 (2004)
East Fork Lewis River	Just Below Green Fork	*	*	2001-2002	0	15.9 (2002)
East Fork Lewis River	Below Little Creek	18.0	17.1	1999-2001 2003-2004	3	17.2 (2000)
East Fork Lewis River	Below McKinley Ck	*	*	1996-1998	3	17.2 (1998)
East Fork Lewis River	Just Above Slide Creek	*	*	2001-2002	1	16.7 (2001)
Slide Creek	¼ Mile above East Fork	*	*	2001-2002	0	15.8 (2001)
East Fork Lewis River*	Below Slide Creek	*	*	2001-2002	2	17.6 (2001)
East Fork Lewis River	Below Sunset Falls Campground	19.7	19.1	2001-2004	3	19.1 (2004)
Copper Creek	Above Bolin Creek	*	*	1996-2002	4	17.2 (2002)
East Fork Lewis River	Above Niccolls Ck	*	*	1997, 1999-2003	6	19.8 (2003)
*Data not collected in 2004.						
Bold denotes site exceeded temperature standard during 2004.						

**Yale Reservoir and Merwin Reservoir Watersheds**

Stream Name	Monitoring location	Maximum temp. in 2004 (oC)	Maximum 7-day average temp. in 2004 (oC)	Years monitored	Years temp. exceeded Maximum 7-day average of 16.0oC (#)	Highest Maximum 7-day average temp. (oC) during monitoring period (Year)
Siouxon Creek	Below West Creek	18.0	17.7	1996-2000 2003-2004	6	18.2 (1997,2003)
Canyon Creek	Above Jake's Creek	*	*	2001-2002	0	12.4 (2001)
Canyon Creek	Above Big Rock Creek	16.0	15.3	1997-1998 2001-2004	0	15.9 (2003)
*Data not collected in 2004. Bold denotes site exceeded temperature standard during 2004.						

Wind River Watershed

Stream Name	Monitoring location	Maximum temp. in 2004 (°C)	Maximum 7-day average temp. in 2004 (°C)	Years monitored	Years temp. exceeded Maximum 7-day average of 16.0°C (#)	Highest Maximum 7-day average temp. (°C) during monitoring period (Year)
Wind River Headwaters	Above Pete's Gulch	*	*	1998-2002	0	16.0 (2002)
Pete's Gulch	Above confl. w/ Wind River	*	*	1999-2002	0	15.3 (2001)
Wind River	Below Paradise Creek	*	*	1999-2002	3	16.8 (2001,2002)
Wind River	Above Falls Creek	*	*	1993 1999-2002	4	16.8 (2001)
Falls Creek	Above confl. w/Wind River	*	*	1998-2003	1	16.2 (2001)
Trapper Creek	River mile 1.8	15.8	15.5	1995-1997 1999-2004	0	15.5 (2004)
Wind River Baseline	Below Trapper Creek	*	*	1995-2000 2002-2003	4	18.5 (2003)
Wind River	Above Trout Creek	18.7	18.3	2003-2004	2	18.4 (2003)
Trout Creek	Above Crater Creek	8.2	7.5	2003-2004	0	8.2 (2004)
Crater Creek	Above Trout Creek	16.8	16.4	2003-2004	2	18.6 (2003)
Compass Creek	River mile 2.1	15.8	15.5	2002-2004	0	15.9 (2003)
Compass Creek	Above Trout Creek	17.8	16.7	2003-2004	1	16.7 (2004)
Trout Creek (East Fork)	Above Trout Creek	20.5	19.5	2003-2004	2	19.5 (2004)
Layout Creek	Above Trout Creek	21.7	21.0	2003-2004	1	22.4 (2003)
Trout Creek	Below Layout Creek	*	*	2003	1	17.9 (2003)
Trout Creek	Below Planting Ck	19.0	18.2	2003-2004	2	20.3 (2003)
Trout Creek Above Baseline	Above Hemlock Lake	21.6	20.6	2004	1	20.6 (2004)
Trout Creek Baseline	Above Hemlock Lake	*	*	1995-2000 2002-2003	8	22.1 (1998)
Trout Creek	Below Hemlock Lake	*	*	2002-2003	2	23.8 (2003)
Trout Creek	Above Martha Creek	22.8	21.9	2002-2004	3	23.0 (2003)
Martha Creek	River mile 0.5	*	*	1998,2002	2	24.8 (1998)
Wind River	Below Trout Creek	17.5	17.1	2002-2004	2	17.5 (2003)
Panther Ck. Baseline	River mile 6.5	12.0	11.7	1996-2004	0	12.3 (2001)
Bear Creek Baseline	River mile 2.8	15.9	15.8	1977-2004	1	17.1 (1998)

*Data not collected in 2004.

Bold denotes site exceeded temperature standard during 2004.



Preparers

<u>Name</u>	<u>Discipline</u>
Ruth Gittins	Financial Management
Diana Perez-Rose	Fish
Bruce Holmson	Grazing
Rick McClure	Heritage Resources
Ruth Tracy	Hydrology
Jim Chamberlin	Mining
John Roland	Monitoring Coordinator
Tom Savage and Steve Nelson	Recreation
Aldo Aguilar	Soils
Paul Seitz	Transportation
Bob Obedzinski	Vegetation Management
Carol Chandler	Wildlife/Botany/Range

Gifford Pinchot National Forest Administrative Units

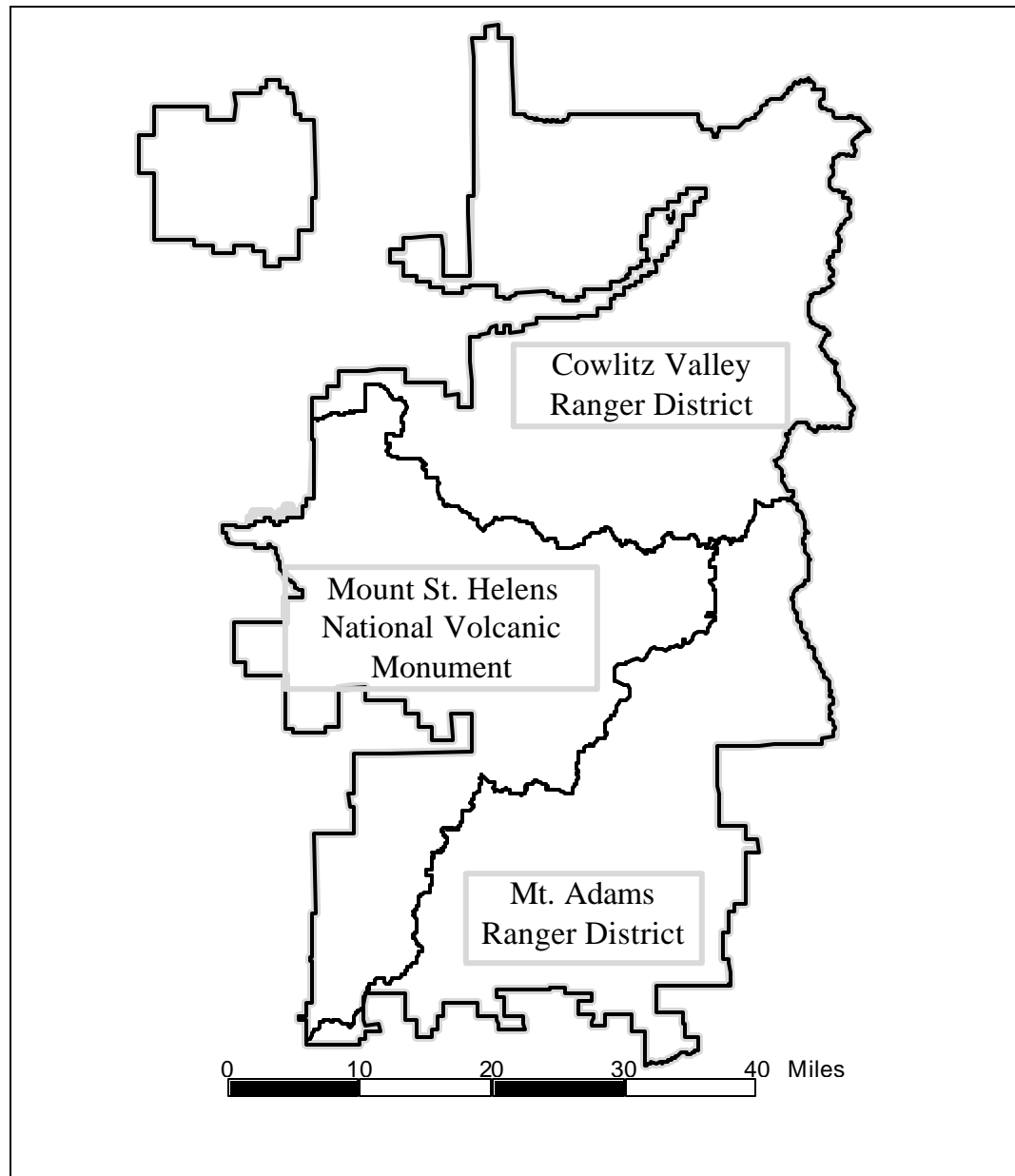


Figure 45 - Administrative Units

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