



**NORTHWEST
FOREST PLAN**
THE FIRST TEN YEARS (1994–2003)

Implementation Monitoring: Summary of Regional Interagency Monitoring Results

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Preface

This report is one of a set of reports produced on this 10-year anniversary of the Northwest Forest Plan (the Plan). The collection of reports attempts to answer questions about the effectiveness of the Plan based on new monitoring and research results. The set includes a series of status and trend reports, a synthesis of all regional monitoring and research results, a report on interagency information management, and a summary report.

The status and trend reports focus on establishing baselines of information from 1994, when the Plan was approved, and reporting change over the 10-year period.

The status and trend series includes reports on late-successional and old-growth forest, northern spotted owl (*Strix occidentalis caurina*) population and habitat, marbled murrelet (*Brachyramphus marmoratus*) population and habitat, watershed condition, government-to-government tribal relationships, socioeconomic conditions, and monitoring of project implementation under Plan standards and guidelines (this report).

The synthesis report addresses questions about the effectiveness of the Plan by using the status and trend results and new research. It focuses on

the validity of the Plan assumptions, differences between expectations and what actually happened, the certainty of the findings, and, finally, considerations for the future.

The synthesis report is organized in two parts: Part I – introduction, context, synthesis and summary – and Part II – socioeconomic implications, older forests, species conservation, the aquatic conservation strategy, and adaptive management and monitoring.

The report on interagency information management identifies issues and recommends solutions for resolving data and mapping problems encountered during the preparation of the set of monitoring reports.

Information management issues inevitably surface during analyses that require data from multiple agencies covering large geographic areas. The goal of that report is to improve the integration and acquisition of interagency data for the next comprehensive report.



Little River Adaptive Management Area, SW Oregon Province, showing areas of prior harvest.

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Introduction

The Northwest Forest Plan (the Plan) encompasses more than 25 million acres of federal land managed by the Forest Service (FS), Bureau of Land Management (BLM), and the National Park Service (NPS) in western Washington, Oregon, and northwest California. The Plan amended planning documents for 19 National Forests and 7 BLM Districts in 1994.

This effort represents the first time that two of the largest federal land-management agencies have developed and adopted a common management approach to the lands they administer throughout an entire ecological region.

The Plan covers the managing of habitat for late-successional and old-growth-related species in the range of the northern spotted owl. It provides a comprehensive strategy to support a healthy forest ecosystem with protective measures for riparian areas and waters. And it also provides for forest products to maintain the stability of local and regional economies predictably and for the long-term.

Key elements of the Plan are the system of reserves, an aquatic conservation strategy, and various standards and guides affecting each of seven different land allocations: congressionally reserved, late-successional reserve, adaptive management areas, managed late-successional areas, administratively withdrawn areas, riparian reserves, and matrix lands.

The Plan's record of decision (ROD) required monitoring to provide information on the Plan's relative success. In 1994, regional executives were concerned about whether agencies could implement the sweeping changes the Plan requires across this broad geographic area, so a regional implementation monitoring program was formulated and designed to examine how well standards and guides were applied on the ground from project to project.

Effectiveness monitoring at the broader scale was to measure how well projects and other activities had achieved the objectives, goals, and desired outcomes of the Plan. Monitoring was expected to accommodate multiple scales to assure that localized information could be compiled and considered in a broader regional context and addressing both local and regional issues. Monitoring was expected to be coordinated among appropriate agencies and organizations to enhance the efficiency and usefulness of the results across a

variety of administrative units and provinces (ROD, E-2).

This summary reports results of regional implementation monitoring by the provincial advisory committees (PACs); the summary is not intended to report on the entire array of monitoring conducted and reported locally in National Forests and BLM Districts.

Many of the FS and BLM administrative units in the area of the Plan conducted local implementation monitoring and reported annually. Their monitoring focuses on issues relevant to local managers and interested parties because many differences are local.

This report¹ summarizes information gathered from 1996 to 2003 during the PACs' review of project- and watershed-scale activities.

In addition to the PACs' monitoring, the Region provided a summary of key Plan accomplishments. These summaries provide important context for assessing progress toward meeting the goals and objectives of the Plan as well as those of the standards and guides.



Provincial implementation monitoring team reviewing the watershed, Yakima province.

¹The entire report, "Northwest Forest Plan – The First Ten Years (1994-2003): Summary of Regional Interagency Monitoring Results" can be found at <http://www.reo.gov/monitoring/10yr-report/implementation/final-report.html>.

Provincial Advisory Committees

A part of implementation monitoring was to involve members of the local communities, organizations, and agencies. The ROD recognized this need and provided the framework to establish and support 12 PACs in the Plan area (figure 1).

The PACs have up to 29 members, including representatives from federal, state, county, and tribal governments; the timber industry; environmental groups; recreation and tourism organizations; and up to 5 other public-at-large members.

The PACs serve as key advisory bodies to the 12 provincial interagency executive committees, whose members are directly responsible for federal land management activities in each province.



Upland habitat restoration, SW Oregon Province.

These committees are meant to encourage and facilitate information exchange and complementary ecosystem management among federal and nonfederal land managers in the planning provinces. The PACs were also to gather information on the implementing of the Plan and to advise federal land managers of project- and watershed-scale activities on federal lands. They were to examine project information, provide monitoring reports, and to serve as a communication link between the land-management and regulatory-agency executives and the local public.

These committees were expected to meet regularly to provide advice to the implementing agencies.

These advisory committees marked an important step forward for both interagency and intergovernmental coordination, and they are creating new ways to involve local governments, tribes, and the public in managing the Plan's forests.

The committees allow a wide representation of interests to be heard by federal policy makers while still complying with the requirements of the Federal Advisory Committee Act. This law requires that the membership of an advisory committee represent a balance among various groups, communities,

Figure 1. Northwest Forest Plan area.

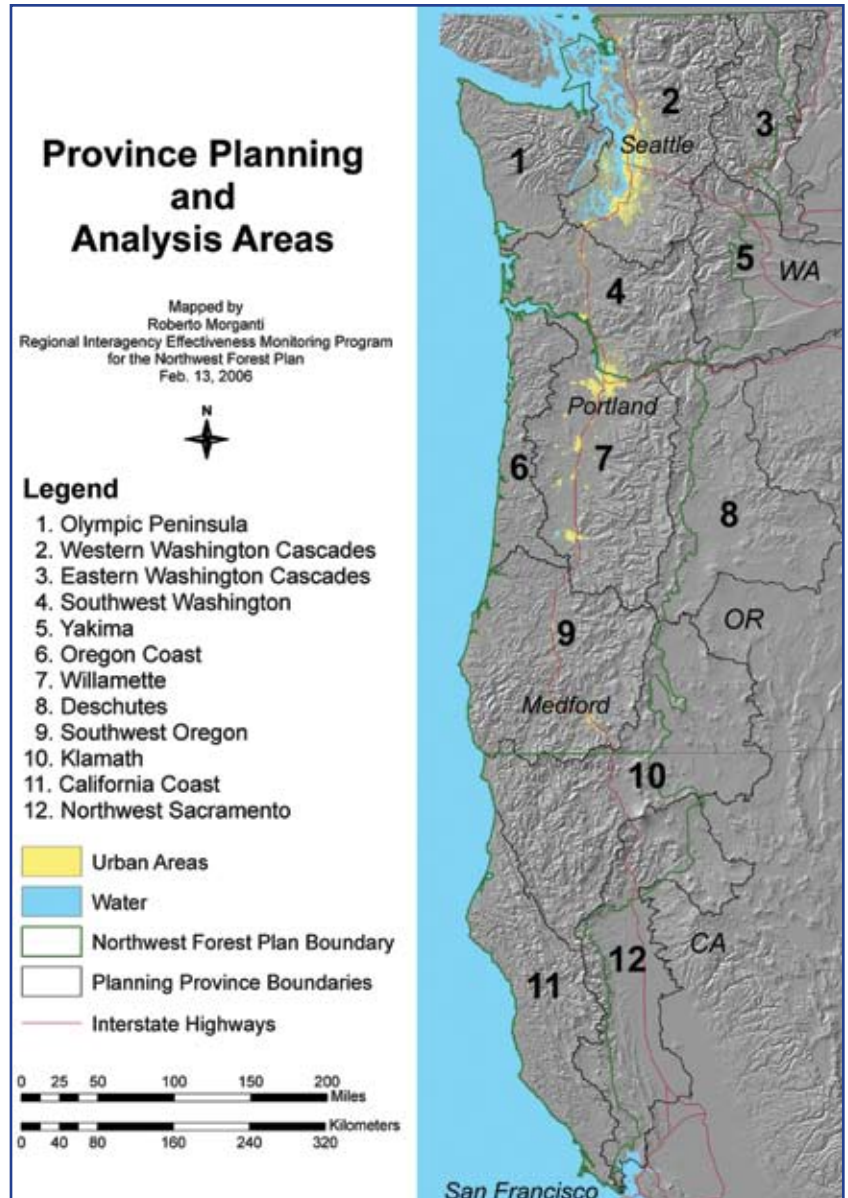
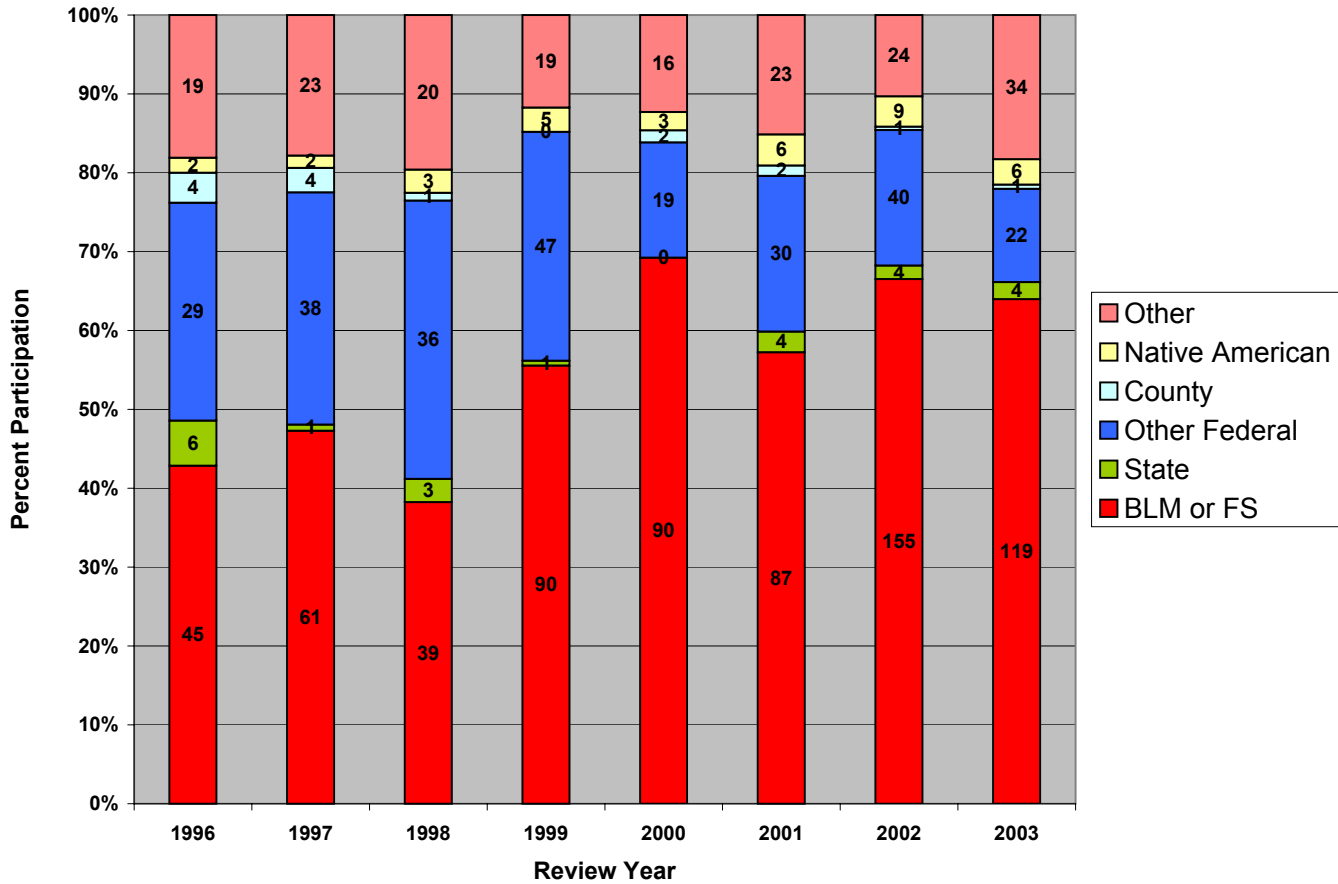




Figure 2. Participation in implementation (compliance) monitoring reviews 1996-2003. Examples of the "other" participant category include nonfederal participants representing the following interests: environmental, timber, recreation, public at large, mining, homeowners, and so on.



and other people interested in natural resources, and that the number of seats on the committees should be limited to a workable size.

Participation in monitoring reviews by the PAC members, the host unit, and others is the key component of the implementation monitoring strategy, which uses members of the 12 PACs in reviewing project documentation and visiting the projects in the field.

Project compliance with the Plan's standards and guides is determined by the PAC members and is based on documentation, field visits, and sometimes by measurements in the field. The results and participation are collated each year into one regional report.

The participation information was used to develop figure 2, which shows participation in the monitoring reviews by affiliation. These data show a good and fairly consistent distribution of participants by affiliation.

As expected, the BLM and FS represent the highest participant percentage because the number includes the staff

needed to explain the project and provide logistics for the monitoring trips.

Total participation by nonfederal PAC members from 1996-2003 was 304 people.



Photo by D. Baker

Interagency participation in implementation monitoring, W Washington Cascades Province.

Implementation Monitoring Background and Procedures

For the PACs to consistently conduct compliance monitoring across the Plan area, a draft protocol was developed in 1995 to guide standard and guide implementation monitoring (Alegria et al. 1995).

Although not all components of the protocol have been enacted, the major effort of monitoring standards and guides has been operative since 1996. These components include using a standardized set of questionnaires, the PACs determining project and watershed compliance with standards and guides, aggregating results to the Plan scale, and reporting results annually.

The approach to implementation monitoring was to review and evaluate a sample of Plan projects each year to determine if the standards and guides were being followed.

The project types to be monitored each year are identified by consulting with the monitoring program managers at the regional scale and reviewing the PACs' advice from the previous year's monitoring.



Provincial implementation monitoring team, reviewing a project, California Coast Province.

A list of projects and activities is compiled by the region from field input, and the projects to be monitored are randomly selected from this list.

The annual procedure for monitoring used PAC members, with support from

the host unit and regional implementation monitoring team members, to assure consistent application of the procedure.

The teams use standardized questionnaires to allow collating results to the Plan scale. The detailed procedure provides direction on how to plan and conduct the monitoring reviews, prepare provincial-scale reports, ensure a consistent



Reviewing a recreation project, Olympic Province.

approach, and provide input to assist in selecting the focus for the next year's monitoring.

The results of monitoring are directly attributable to PAC members' participation in the reviews and the findings are theirs, not the land management agencies'.

A database program was developed in 2003-2004 for data capture and to allow trend analysis for multiple-year monitoring results; the program was especially useful for the ten-year report. Earlier results were reported only annually and no attempt had been made to analyze results for a longer period.

The database also allows generating the questionnaire specifically to project type and land-use allocation, reducing non-applicable questions and facilitating the ease of the review.

¹Alegria, J., Hyzer, M., Mulder, B., Schnoes, B., and Tolle, T. 1995. Guidance for implementation monitoring for management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. Draft. Available online at http://www.reo.gov/monitoring/report_show.php?show=implementation

Compliance Monitoring Results

The monitoring of 240 projects from 1996 to 2003 showed that overall compliance with standards and guides was high and averaged 96 percent or higher in all years monitored (figure 3). Overall compliance monitoring results are depicted in figure 3.

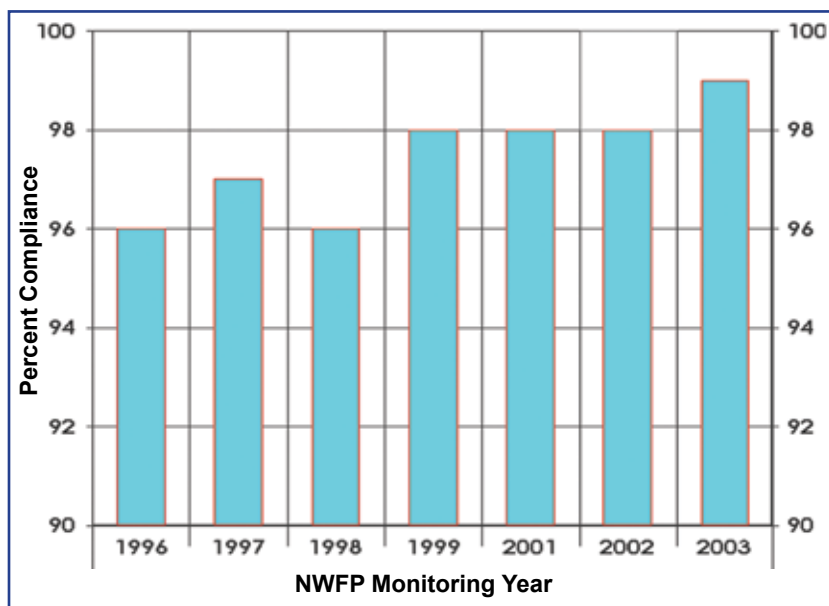
Specific compliance results for timber sales, watersheds, and other activities are on pages 8, 9, 14 and 15. Some project types, such as grazing and mining, have not been monitored sufficiently to report on individual compliance results.

Results of Implementation Monitoring – Beyond the Numbers

Implementation monitoring resulted in more benefits than just recording percentage compliance. Most of the results were gleaned from visits to projects and watersheds on the ground and discussions in the field that contributed to clearer understanding among participants, and fostered personal contacts. Some of the more important aspects are:

- ❖ Issues of interpretation and understanding of the standards and guides were discussed and resolved—especially locally—both with the public and land management agencies.
- ❖ Increased understanding and communications resulted between the regulatory agencies [U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries—previously the National Marine Fisheries Service] and the land management agencies.
- ❖ Working with PACs for implementation monitoring changed the way monitoring had been conducted by the land

Figure 3. Percentage compliance for projects monitored by year, 1996-2003. In 2000, only watershed assessments were monitored.



management agencies.

- ❖ A random-selection process resulted in an unbiased method for the selection of projects for monitoring.
- ❖ Use of a standardized set of questionnaires allowed aggregating the results to the regional scale, which had not yet been attempted or achieved.
- ❖ Automating questionnaire generation, data capture, and report generation has led to increased efficiencies in data analysis and more involvement by the local administrative units. Information is more readily shared among the agencies and administrative units. Questions of compliance can be answered reliably and reported to other agencies.
- ❖ The compliance monitoring database automates the data capture for the compliance results and participation in implementation monitoring.
- ❖ Because no handbook had existed for conducting regional monitoring, the processes and components of the implementation monitoring program have now been reviewed and incorporated into other monitoring activities both in and outside of the federal agencies.

An unanticipated result of PAC members' review of the monitoring review was an increase in agency credibility. Reports from PAC members stated that the professionalism, expertise, complexity, and detail required to plan and implement agency actions by the federal land management agencies was exceptional. They were surprised at the length and depth of environmental analysis needed, and they learned the extensive requirements that must be met for planning actions.

The contributions of the PAC members in monitoring also resulted in regulatory agencies - USFWS and NOAA-Fisheries - improved communication with local FS and BLM personnel because of the personal contacts made and improved.

Timber Harvest - Background

Much of the timber harvest under the Plan was expected to come from regeneration harvest in late-successional and old-growth forests within matrix and adaptive management areas. The Plan used the term probable sale quantity (PSQ) for estimating the likely sustainable average annual timber-sale volume.

The Plan initially identified the PSQ as 958 million board feet. This was adjusted in 1995 to 868 million board feet to account for completed land and resource management plans for western Oregon BLM districts and 4 California National Forests. The PSQ was again adjusted, resulting in a current PSQ of 805 million board feet (table 1).

Timber from other lands, such as late-successional and riparian reserves, was not included in the projected harvest estimates.

Thinning of dense young stands in late-successional reserves was expected to produce additional volume as a byproduct of treatments designed to enhance the reserves.

Table 1. Probable sale quantity (PSQ) adjustments

Year	Agency, Region	PSQ, millions of board feet	Change in PSQ
1994, ROD	FS, Region 6	533	
	FS, Region 5	224	
	BLM	201	
	Total	958	
1995	FS, Region 6	533	
	FS, Region 5	161	-63
	BLM	174	-27
	Total	868	-90
1999	FS, Region 6	476	-57
	FS, Region 5	161	
	BLM	174	
	Total	811	-57
2001	FS, Region 6	476	
	FS, Region 5	161	
	BLM	168	-6*
	Total	805	-6

*BLM declared the 6 million board foot adjustment retroactive to 1999.



Photo by John Hutmacher

Timber sale, Deschutes Province.

Probable Sale Quantity

Probable sale quantity (PSQ) describes the allowable harvest rates that could be maintained without decline over the long term if the schedule of harvests and regeneration were allowed. Only harvest from matrix and adaptive management area lands are counted; harvest from reserve or other lands does not contribute to PSQ. The PSQ represents neither minimum amounts that must be met nor maximums that cannot be exceeded. The PSQ is a rough estimate because of the difficulty associated with predicting actual timber sales over the first decade of the Plan, given the discretion that agency land managers have in administering plans and deciding when and where to offer timber sales, as well as the complex nature of implementing many of the standards and guides.

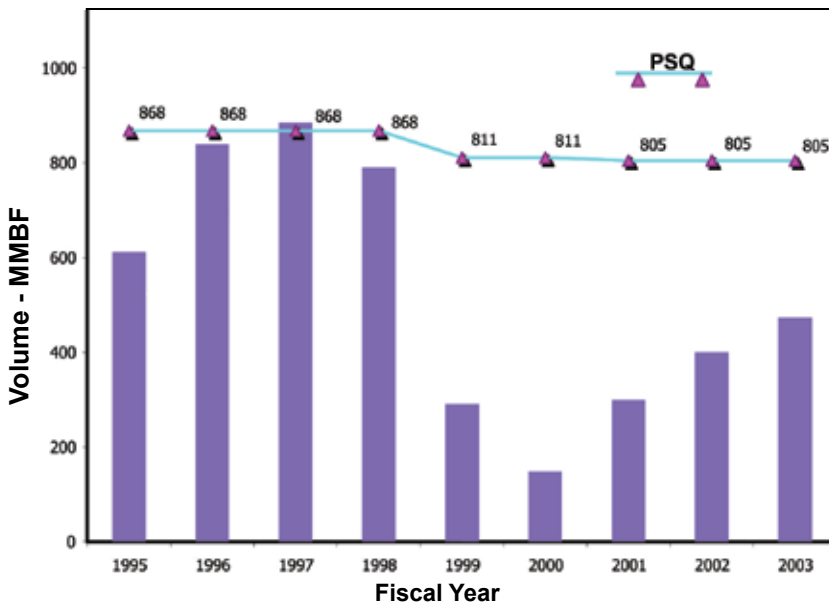


Photo by Tom Iraci

Thinning harvest, Western Washington

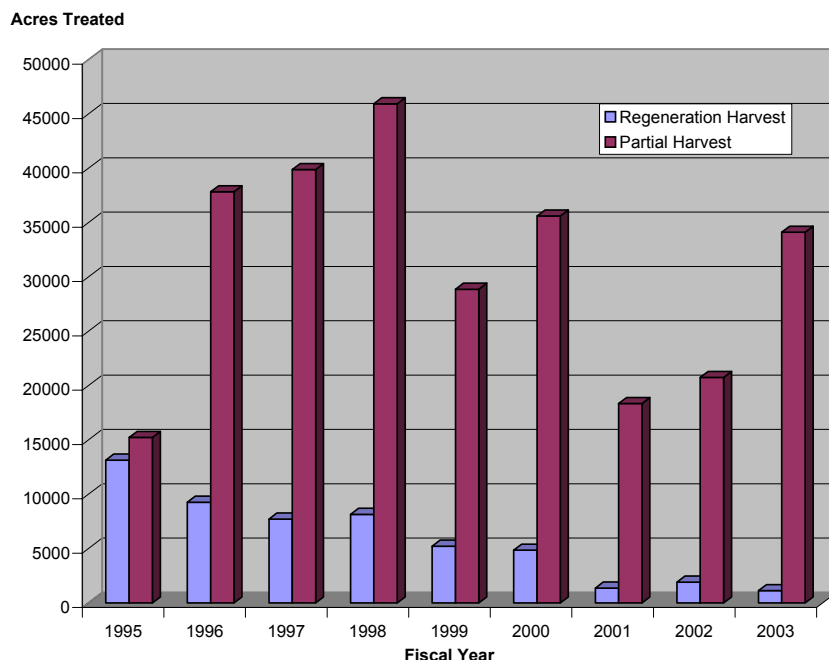
Timber Harvest - Results

Figure 4. Probable sale quantities compared to volume offered^a.



^a All volumes are in 32 foot logs. Volume offered includes volume arising from lands not contributing to PSQ, such as late-successional and riparian reserves; therefore, direct comparisons cannot be made. Note, however, that volume offered for the reporting period has not met PSQ, on average. About 80 percent of the volume offered arises from matrix and adaptive management areas, which are attributable to PSQ.

Figure 5. Acres treated by harvest method^a.



^a Figure does not include acres treated for the BLM in California. Regeneration harvest includes clearcut, preparation cut, seed cut and removal cut. Partial harvest includes selection cut, improvement cut, commercial thin, sanitation and special cut.

For the reporting period from 1995 to 2003, about 4.736 billion board feet of timber were offered for sale in the Plan area, about 3.633 billion board feet by the FS and about 1.103 billion board feet by the BLM. An average of about 526 million board feet of timber was offered annually in the 9 years of the reporting period (figure 4).

The volume attributable to the PSQ was about 80 percent of the total volume offered over the 9-year reporting period; approximately 20 percent of the total volume offered resulted from activities designed to achieve conservation objectives within the reserves.

Of the 329,000 acres harvested, 277,000 acres (84%) were treated by techniques characterized as partial harvest; that is, harvest where many trees were left in the harvested units after the timber sale was completed.

These types of harvest are typified by thinning or uneven-aged management. Regeneration harvest was used on 52,850 acres (15%) (figure 5).

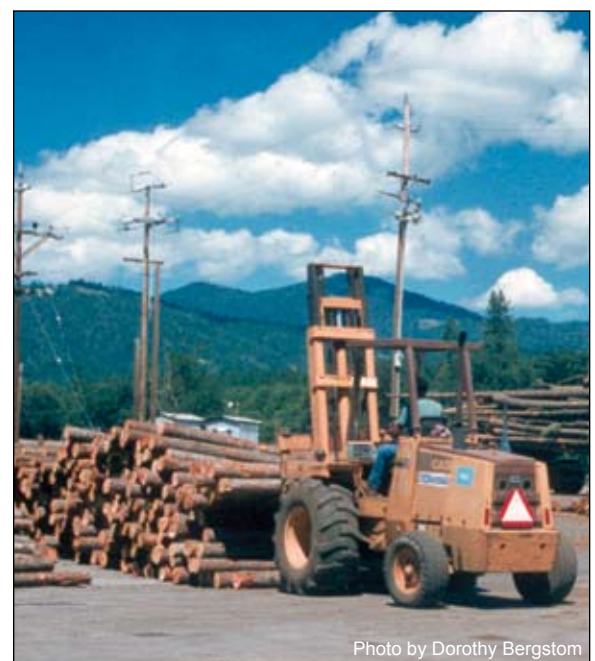


Photo by Dorothy Bergstrom

From 1995 to 2003, 4.7 billion board feet of timber were offered for sale by FS and BLM.

Timber - sale compliance with Standards and Guides

Between 1996 and 2003, 162 timber sales were monitored by the PACs to determine compliance with standards and guides: 123 projects were in matrix lands, 93 projects were in late-successional reserves and managed late-successional areas, and 70 projects were in adaptive management areas with many of the timber sales in multiple land-use allocations.

Compliance was 97 percent for the 162 timber sales monitored (figure 6). Compliance with standards and guides ranged from 67 to 100 percent. Of the 162 timber sales monitored, 150 had compliance above 90 percent, and 91 sales were 100 percent compliant.

The provincial advisory committees found areas of non-compliance, including not meeting snag requirements, improper identification of coarse woody debris amounts in areas of partial harvest, not meeting coarse woody debris amounts in regeneration harvest areas, not designating green-tree-retention patches indefinitely, not excluding riparian reserves from timber harvest, and not following guides for designating riparian reserves for perennially flowing non-fish bearing streams and intermittent streams.

Non-compliance elements were analyzed to determine underlying causes. Instances of non-compliance were grouped into three categories: improper planning, improper implementation, and other.

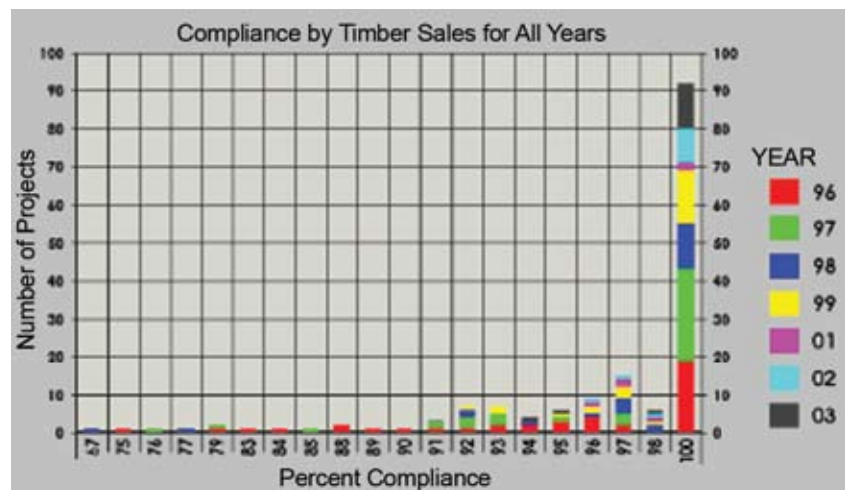
Improper planning resulted when the planning documents indicated that the standards and guides were not considered during the planning stages of the project and therefore were not implemented on the ground.

Improper implementation resulted where the standards and guides were considered during the planning stages and intended to be followed when the

project was implemented, but was not implemented on the ground.

The “other” category was when the standard was applied to a project with an intentional reason for not meeting the standard. Many standards and guides were written to pertain to timber sales regardless of the reason for the timber sale. For an example, if snags are to be left because the standard states

Figure 6. Compliance for timber-sale projects from 1996 through 2003^a. The number of projects reviewed was 162.



^a No timber sales were monitored in 2000, only watershed-scale standards and guides.



Photo by D. Baker

Commercial thinning and density management to stimulate the growth of the remaining trees, E. Washington Cascades Province.



a timber sale must do so, but the reason for the timber sale was to remove snags in a campground - obviously the intent of the timber sale was to remove a hazard from a public high-use area for their safety and protection. Thus the standard's snag retention requirement could not be met.

The PACs found 14 standards and guides with 3 or more projects with non-compliance responses. Of the 82 instances of non-compliance associated with timber sales--out of 4,584

applicable questions--43 were attributable to improper planning, 16 for improper implementation, and 23 for other reasons.

Instances of non-compliance did not appear to be associated with a particular administrative unit or land use allocation. As a result of local involvement in the monitoring reviews, instances of non-compliance were recognized immediately, and, where possible, the deficiencies were corrected.

Non-compliance was low throughout the reporting period and there was no particular pattern of non-compliance. No need for major changes in standards and guides was found, except in educating administrative units in properly implementing projects on the ground, mostly as a result of the implementation monitoring program.



Photo by D. Baker

Lack of appropriate levels of course woody debris was a finding of noncompliance.



Photo by M. Learn

Timber sale, Yakima Province.



Photo by D. Baker

Timber sale, SW Oregon Province.

Aquatic Conservation Strategy Components

The aquatic conservation strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems on public lands. This approach was to be applied at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and to restore currently degraded habitat.

The strategy was designed to prevent further degradation and restore habitat over broad landscapes, as opposed to individual projects or small watersheds.

Because the strategy is based on natural disturbance processes, decades - or perhaps more than a century - may be needed to accomplish all of the strategy's objectives. Some improvements in aquatic ecosystems can be expected in the first few decades of the Plan (ROD, B-9), however.

The strategy has four components: riparian reserves, key watersheds, watershed analysis, and watershed restoration. Accomplishments associated with the aquatic conservation strategy and, where appropriate, the results of compliance monitoring are described below.

Riparian reserves

Between 1998 and 2003, the agencies acted to improve streams, wetlands, and habitat in the riparian reserves. The improvements included placing structures in 927 miles of streams; 661 miles of improved instream fish passage; 68,847 riparian acres treated for enhancement; 660 miles of riparian zone enhanced, and 1,503 acres of wetlands enhanced. More than 90 million dollars were spent in watershed restoration projects from 1998 to 2003 (see table 5, p. 13).

The agencies generally mapped the interim riparian reserves as projects were planned. According to the ROD, the interim reserve widths - the initial default widths - were designed to provide substantial protection for fish and riparian habitat until watershed and site-specific analysis could be completed.

Few adjustments were made to the default widths (2003 Biological Assessment, p. 66) but some adjustments were needed, especially where hydrologic breaks made the change obvious (when an interim reserve extended over the top of a ridge).



Photo by D. Baker

Riparian area rehabilitation and abatement of a fish passage problem, SW Oregon Province.

Results from the PAC's implementation monitoring of watershed-scale activities from 1999 to 2002 supports this observation. Of 78 watersheds reviewed, riparian reserve widths had not been adjusted in 67 watersheds (nearly 86 percent). During the reviews, field personnel reported that the default widths were considered adequate or better, and no compelling rationale was found for supporting any adjustments.

Project-scale monitoring by the PACs from 1999-2003 showed that standards and guides in the ROD designed to establish riparian reserves for seasonally flowing or intermittent streams were met 92 percent of the time and permanently flowing, non-fishbearing streams were met 97 percent of the time, for the applicable projects monitored. These two categories of riparian reserves were found to have the lowest percent compliance of all the categories.



Photo by C. Sipher

Riparian area hardwood conversion, SW Oregon Province.

Key Watershed Management

Agencies identified 164 key watersheds (figure 7) in the Plan area, encompassing 9,121,100 acres or 37 percent of the Plan land base.

Two types of key watersheds were recognized.

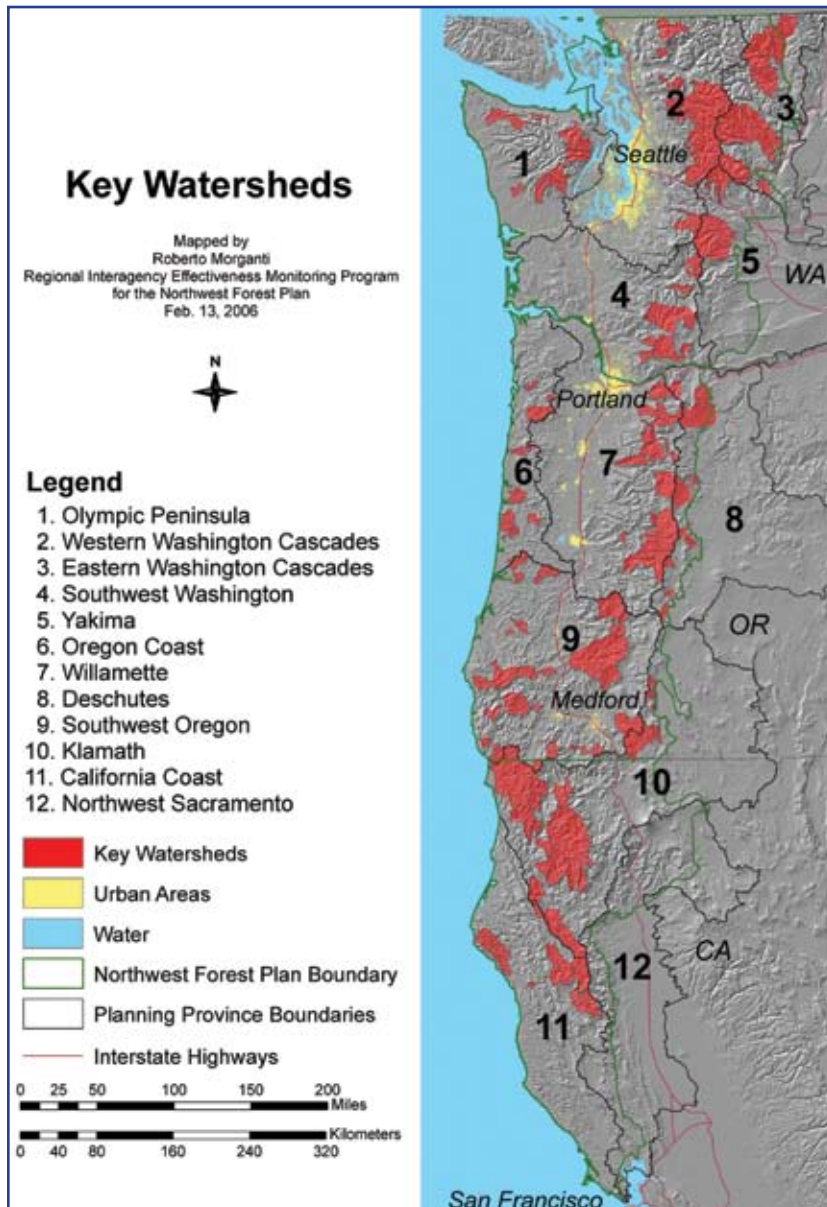
- ✦ Tier 1 watersheds were established to contribute directly to conserving at-risk fish species; they also have a high potential for being restored and were mostly watersheds previously identified by the scientific panel on late-successional forests in 1991 or the scientific analysis team in 1993.

- ✦ Tier 2 watersheds are important sources of high-quality water, but they may or may not contain at-risk fish stocks.

Activities reported in key watersheds from 1998-2003 included: 240 miles of instream structure placement; 117 miles of improved

instream fish passage; 3,933 acres of riparian enhancement; 113 miles of riparian zone enhanced; and 286 acres of wetlands enhanced. In addition, 295 miles of roads were decommissioned, and 1,235 miles of road were improved to reduce sedimentation and resource damage.

Figure 7. Key watersheds in the Plan area.



In-stream structure (culvert) to abate seasonal instream passage problem, Olympic Province.

The PACs' monitoring showed that road mileage in 40 reviewed key watersheds was reduced through road closures and decommissioning by 509 miles.

Specifically, in the key watersheds monitored, road mileage was reduced in 34 of the 40 key watersheds, increased in 1 (temporary roads), and remained constant in the remaining 5 (no new building or reductions).



Wetlands habitat restoration in key watershed, Deschutes Province.

Watershed Analysis

Watershed analysis is a systematic procedure for characterizing the aquatic, riparian, and terrestrial features in a watershed. Managers were expected to use the information gathered during watershed analysis to refine riparian reserve boundaries, prescribe land management activities (including watershed restoration), and develop monitoring programs (ROD, p. 10).

Watershed analysis is required in key watersheds, for roadless areas in non-key watersheds, and in riparian reserves before starting land management activities. Ultimately, watershed analysis should be conducted in all watersheds on federal lands as a basis for ecosystem planning and management (ROD, p. B-20).

About 550 fifth-field watersheds containing lands managed by the FS and BLM are in the Plan area. Agency records, supported by implementation monitoring results, showed that watershed analysis was completed for 89 percent of the watersheds in the area of the Plan, providing coverage of more than 85 percent of the federal land area of all administrative units in the Plan area (table 2).

The administrative units reported completed watershed analyses of more than



Photo by D. Baker

Wynoochee Watershed, Olympic Province.

91 percent of the area in the 164 key watersheds.

Nearly 93 percent of the monitored watersheds had a watershed analysis completed before 1998, and about 10 percent of the watershed analyses (those monitored) had been updated. Watershed analyses were often not yet finished if the watersheds had small federal acreages or lacked planned activities.



Photo by A. Henning

Photo by D. Baker

Big Marsh watershed analysis review, Deschutes Province.

Table 2. Completed watershed analyses.

	Number	Completed	Not completed	Completed, %
Key watersheds^a	111	103	8	92.7
Non-key watersheds^a	217	193	24	89
Other watersheds of unknown status	282	248	34	88
Total^b	610	544	66	89

^aData are available for only 15 administrative units differentiating between key and non-key watersheds.

^bThe information is for 28 administrative units: the total includes analyses for both 5th- and 6th- field watersheds, and agency records do not make the distinction. Thus, the number is different from the total of 5th-field watersheds (550) in the Plan. Also, the total includes some analyses reported by both agencies where lands adjoin and BLM or FS had the lead.

Watershed Restoration

Watershed restoration is designed to restore currently degraded habitat. The most important components are controlling and reducing road-related runoff and sediment, restoring riparian vegetation, and enhancing instream-habitat complexity.

A particular focus of watershed restoration was on roads. As of 2002, the net system road mileage in administrative units was reduced by 4,307 miles or 4.7 percent (table 3). The amount of roads decommissioned annually averaged about 9 times the amount built each year on agency lands from 1995-2002.

From 2000-2003, an average of 20,590 miles or about 30 percent of FS Region 6 and BLM Oregon system roads were maintained

Table 3. Decrease in road miles by road decommissioning and road closures in the Plan area, through 2002.

Current system mileage	Net change in miles	Net decrease in miles, %
86,813	-4307	4.7

Table 4. Miles of roads maintained in FS Region 6^a and the BLM in Oregon 2000-2003^b.

Year	2000	2001	2002	2003
Miles	20,791	22,988	21,482	17,102

^a Region 5 and the BLM in California are not included.

^b The numbers include all roads maintained in those forests only partially in the Plan area; total miles of system roads in 2002 for FS Region 6 and the BLM in Oregon were 63,480.

Table 5. Summary of restoration project costs by third-field watershed (1998-2003).

Basin name and number	Cost (dollars)	
Upper Columbia	170200	2,629,109
Yakima River	170300	2,592,800
Middle Columbia	170701	1,579,860
Deschutes	170703	2,629,890
Lower Columbia	170800	12,356,022
Willamette	170900	12,577,964
Washington Coastal	171001	5,596,000
Northern Oregon Coastal	171002	9,775,244
Southern Oregon Coastal	171003	26,622,239
Puget Sound	171100	6,354,328
Northern California Coastal	180101	3,834,896
Klamath	180102	4,270,576
Total		\$90,818,928

annually (table 4). As expected, the more traveled roads and problem areas received maintenance priority.

The PACs monitored 89 watersheds in the Plan area from 1999 to 2003. They found that 79 watershed analyses (88 percent) identified opportunities for restoration, and 76 percent used information from the watershed analysis to develop priorities for restoration funding requests.



Photo by D. Baker

Road decommissioning in late-successional reserve, Yakima Province.



Photo by D. Baker

Decommissioned road in California Coast Province roadless area.

Watershed Standards and Guides Compliance

Because of the different scales of management direction in the ROD, some standards and guides pertain to activities above the project scale.

In 1999, a standardized questionnaire was developed to be used by the PACs in evaluat-



Photo by D. Baker

Lack of a road management plan was a common finding of noncompliance.

ing compliance at the watershed scale. The standards and guides apply to province scale and also to the adequacy of the watershed analyses completed for the watershed monitored.

From 1999 to 2003, the PAC's monitored 89 watersheds (figure 8). The monitoring resulted in high variability in complying with the standards and guides covered in the watershed questionnaire.

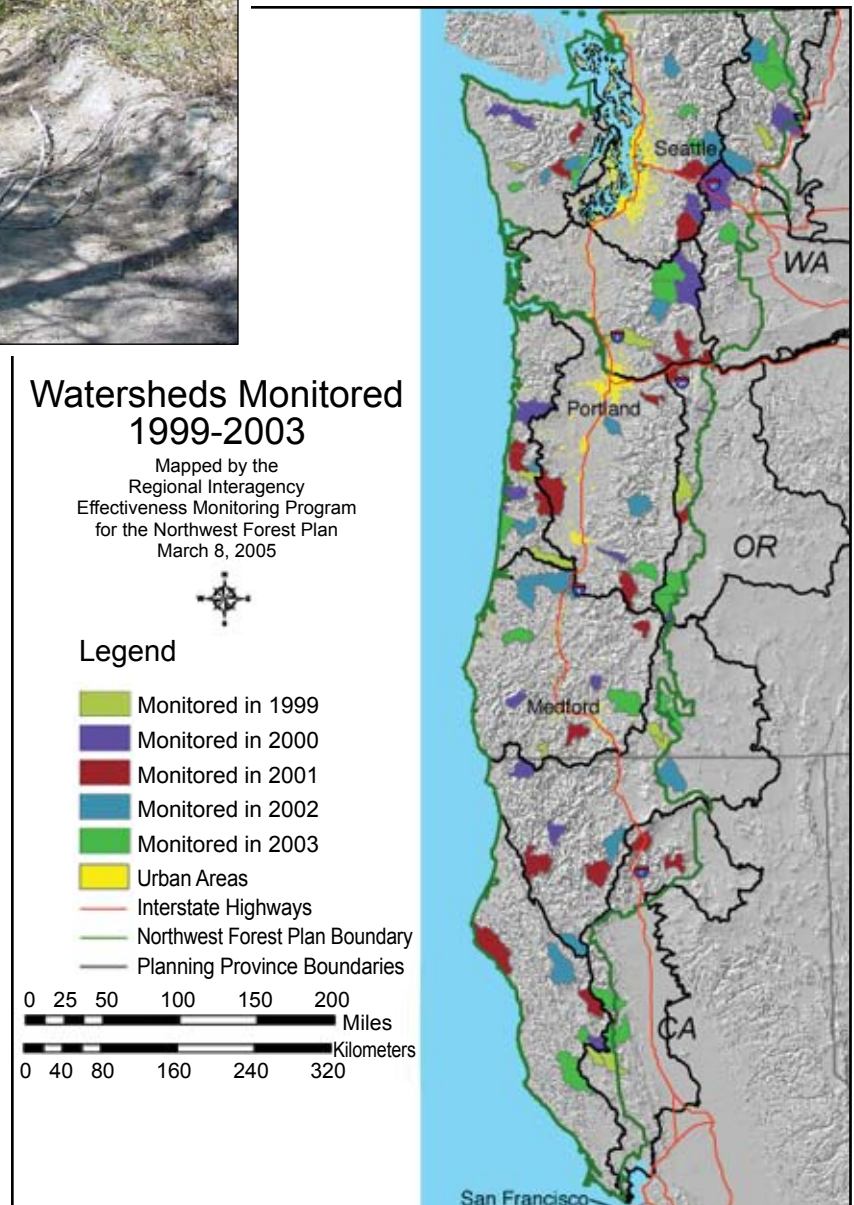
High compliance was noted for some aspects, such as 85 percent of the watersheds had reduced road densities in key watersheds, and 100 percent of the watershed assessments completed had identified restoration opportunities.

Compliance for other standards and guides were in the mid-range (50-85 percent), such as using the watershed analysis information to develop priorities for restoration funding and strategies for monitoring.

The standard and guide (ROD, p. C-33) relating to the development of a road management plan to meet aquatic conservation strategy objectives had a compliance rate of 46 percent.

This lower compliance suggested a possible problem, but during the field monitoring by the PAC members, the administrative units explained that meeting aquatic conservation strategy objectives for transportation elements was adequately addressed in other documentation or through administrative procedures. The standards and guides are in the ROD (p. C-33).

Figure 8. Watersheds monitored 1999-2003



Implementation Monitoring for Other Program Areas

Non-commercial silvicultural treatments - Other silvicultural activities - such as mechanical vegetation and fuels treatments and prescribed fire - were also used in the Plan area. In 2003, 1,904 projects were carried out on 131,603 acres. Most mechanical and prescribed fire fuels projects (68 percent) and acres (59 percent) were in the wildland-urban interface. Annual accomplishments were difficult to track before 2003 and were not reported. Although this information is for one year only, it serves as an initial point or baseline for future monitoring.

Grazing - Range use decreased between 1993 and 2002, as expected. Animal unit months and allotments both decreased by 30 percent, and the number of permittees decreased by 37 percent (figure 9). Grazing is more prevalent in the eastern and southern portions than in other parts of the Plan area.

Figure 9. Comparison of grazing allotments and permittees before (1993) and after (2002) the record of decision.

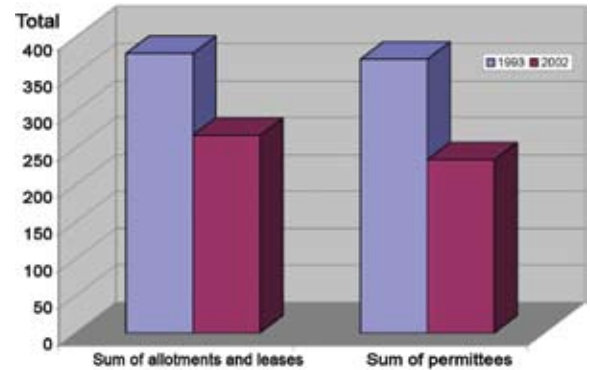


Photo by D. Baker

Project reviewed by provincial implementation monitoring team, Yakima Province

Other activities – standards and guides compliance

Fifteen silvicultural projects were monitored that were not timber sales (mostly precommercial thinning). In addition, 10 prescribed fire projects, 19 road management projects, 26 watershed restoration projects, 4 recreation projects, 1 grazing allotment, and 1 mining project were monitored from 1999 to 2003.

The PACs found similar results in non-compliance with these other projects as with timber sales, 4 standards and guides were associated with non-compliance responses for other projects. Of the 8 instances of non-compliance associated with other projects out of 1,862 applicable questions, 5 were considered attributable to improper planning, 2 with improper implementation, and 1 for other reasons. Compliance was generally high, with non-compliance associated with planning requirements; for example, not complet-

ing a watershed analysis when it was required because the project was in a riparian reserve.

Another instance of non-compliance was not establishing riparian reserves on the ground even though managing the vegetation was considered a benefit to the reserve. No documentation was given to justify the treatment, but during the monitoring the administrative unit did provide the rationale that justified treatment in the reserves.



Photo by C. Jaeger

Sheep grazing, Yakima Province.

Adaptive Management Areas

The adaptive management areas (AMAs) were established to provide areas designed to develop and test new management approaches to integrate and achieve ecological, economic, and other social and community objectives.

The FS and BLM were to work with other organizations, government entities, and private landowners in accomplishing those objectives.



Photo by Doroth Bergstom

AMAs have provided opportunities for research and monitoring related to the Plan.

Each area established had a different emphasis in its prescription, such as maximizing the amount of late-successional forests, improving riparian conditions through silvicultural treatments, and maintaining a predictable flow of harvestable timber and other forest products.

Ten AMAs were established across the Plan area (figure 10). They range from about 92,000 to nearly 500,000 federally managed acres and are well distributed in the Plan area. Management plans were developed for nine of the ten.

The AMAs have provided opportunities for research and monitoring related to the Plan and are listed at the website (<http://www.reo.gov/AMA/index.htm>). The projects are summarized for each AMA in table 6.

Working groups established for the AMAs are active in sharing new information derived from on-going projects. For example, the Central Cascades and Applegate AMAs have shared their results with others through a variety of means, including web pages, tours, newsletters, symposia, and short papers written for public understanding.

In addition, the Central Cascades AMA began bringing in personnel from other ranger districts and resource areas so they could participate in an adaptive-management process, then return to their work units and begin applying the new technology there.

Figure 10. Adaptive management areas in the Plan area.

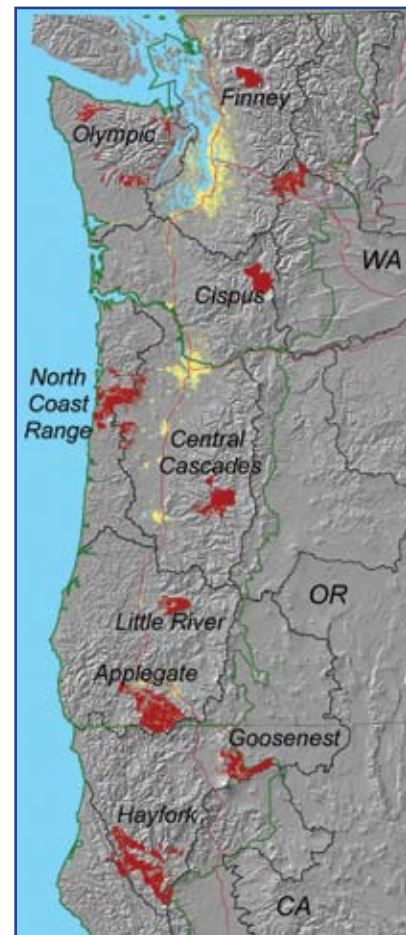


Table 6. Research and monitoring projects in adaptive management areas.

Adaptive management area	Vegetation management	Water and watersheds	Wildlife and fish	Ecosystem processes	Fire science	Insects and disease	Humans and natural resource interactions	Total projects
Finney	a	a	a	a	a	a	a	a
Olympic	2	1	1	1			1	6
Snoqualmie Pass	3	2					2	7
Cispus	5	1	1	2	2	1	2	14
N. Coast Range	9	1	2	4		3		19
Central Cascades	9	19	16	45	2		10	101
Little River	4	3	1	2	2		1	13
Applegate	10		3		4		1	18
Goosenest	2		8	2				12
Hayfork	3		1				1	5
Totals	47	27	33	56	10	4	18	195

^a Not reported.

Lessons Learned

The implementation monitoring program has been effective at achieving the desired objectives of determining compliance rates, increasing communications with other federal agencies and concerned citizens, and providing regional-scale results of local monitoring. More specific successes include:

✦ **Outside feedback from interested citizens and regulatory agency partners** – Having PAC members conduct the monitoring proved a resounding success. Not only were compliance rates determined by an outside group, but additional benefits were realized from the increased communications among the public, federal land managers and regulatory agency personnel.

✦ **Project selection** – Projects were randomly selected to provide an objective monitoring program. Projects received the same consideration whether they were supported or opposed during the planning and implementation phases; so no bias affected the selection of projects for monitoring.

✦ **Standardized questionnaires** – Standardized questionnaires contributed to consistent monitoring approaches across the entire area of the Plan and allowed the combination of results to the Plan scale. Never before have the agencies achieved such a wide-reaching endeavor for implementation monitoring.

✦ **Database for data capture and analysis efficacy** – The compliance monitoring database was developed to capture all the data from all the years of compliance monitoring for the Plan. The database allowed trend analysis over many years, something not attempted before. The database was developed also to aid in local monitoring efforts, especially those related to revisions of FS land and resource plans and BLM resource management plans. And it contains the flexibility and framework for addressing implementation monitoring for future needs.

✦ **Annual Workshops for Monitoring Leaders** – The annual workshop for provincial monitoring team leaders ensured consistent application of the standardized questionnaires, process in

conducting monitoring reviews, and fostering participation in implementation monitoring. Attendance of the regional implementation monitoring team members at local monitoring trips also assured consistent application and interpretation of the monitoring protocol.

✦ **Reporting structure** – The monitoring program provided a common reporting structure for the provincial monitoring and facilitated Plan-wide reporting. The database provided increased efficacy in analyzing of results.



Photo by D. Baker

Monitoring program managers group.



Photo by BLM Roseburg District

Salvage of dead and damaged trees, SW Oregon Province.



Photo by D. Baker

Having PAC members conduct the monitoring proved a success.

Implementation Monitoring Enhancements

Enhancements for improving the monitoring program originated from five sources: annual implementation monitoring reports (1996-2003); analysis of monitoring questions with most non-compliance; findings from the Plan implementation monitoring program 1996-2002 draft report; the May 7-8, 2003, Plan implementation monitoring program review proceedings; and sample design for implementation monitoring of the Plan.

Significant improvements to compliance monitoring have already been achieved as a result of input, findings, and recommendations from several sources. Some of the more noteworthy achievements were

- ❖ Developing a compliance monitoring database;
- ❖ Developing a web page;
- ❖ Publishing reports and summaries annually;
- ❖ Establishing a standardized report format;
- ❖ Selecting projects to be monitored early;
- ❖ Requiring projects to be implemented before review;
- ❖ Conducting an annual workshop for provincial team leaders before field reviews; and,
- ❖ Establishing participation by senior subject-matter specialists and regional team members in reviews.

Additional improvements to the accomplishments and compliance are recommended to make the program more responsive, credible, and efficient, including:

- ❖ Developing an activities database that tracks accomplishments;
- ❖ Improving the follow-up and distribution of compliance monitoring results;
- ❖ Improving participation in monitoring;
- ❖ Establishing a mandate and support for implementation monitoring for field units; and
- ❖ Improving the general program design.

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Graphic Design - Gail Saunders-Boyle, USFS-R6
 Technical Editor - Martha Brookes

