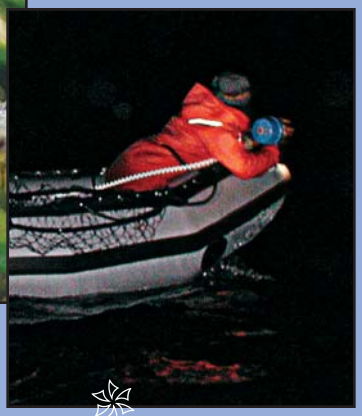
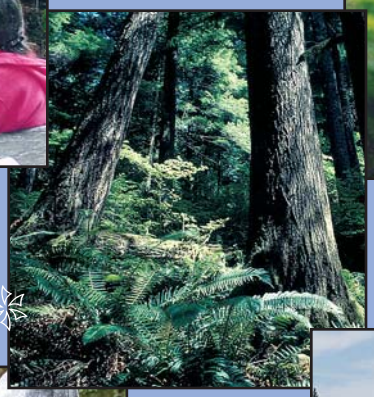
Annual Progress Report 2003

Interagency Regional Monitoring




Northwest Forest Plan - June 2004

Summary

Eight federal agencies have developed an implementation and effectiveness monitoring program encompassing more than 25 million acres of federal land managed by the Forest Service, Bureau of Land Management, and National Park Service in western Washington, Oregon, and northwest California.

This monitoring is focused on answering important regional-scale questions about older forests, listed species (northern spotted owls, marbled murrelets), watershed condition, tribal forest values and relations between federal agencies and Tribes, changing socioeconomic conditions in communities closely tied to federal lands, and compliance with meeting Northwest Forest Plan (the Plan) standards and guidelines.

The purpose of monitoring is to evaluate the success of the Plan in achieving these objectives:

- Protecting and enhancing habitat for late-successional and old-growth forests (older forests) and related species;
- Restoring and maintaining the ecological integrity of watersheds and aquatic ecosystems; and,
- Maintaining sustainable amounts of renewable resources and rural economies and communities.

Highlights from this report include these monitoring efforts:

✓ **The 2004 interpretive report** - A management priority for 2003 was developing information critical to evaluating the success of the Plan. A series of interpretive reports synthesizing this information will be completed in 2004.

Monitoring Spotlight 1
Program Management 2
The Budget 3
Implementation 4-5
Late-Successional & Old-Growth 6-7
Northern Spotted Owl 8-9
MarbledMurrelet 10-11
Watershed Condition 12-13
Social & Economic 14-15
Tribal 16-17
Interagency Monitoring Program Team 18-19
Reports 20-22

✓ **Implementation monitoring** - Compliance in meeting the Plan and Record of Decision standards and guide was 99% for the 23 projects monitored. Twenty-one 5th field watersheds were also monitored in 2003.

✓ **Late-Successional and old-growth monitoring** - In 2003, we finished compiling the map data and inventory data required for analyzing older-forest status and trends. We piloted an approach for estimating older-forest amounts by using a spectrum of operational definitions. We also began compiling the maps of existing vegetation into forest classes and testing the resulting maps for accuracy of the older-forest classes.

✓ **Northern Spotted Owl monitoring** - Surveys at more than 1200 sites determined that the percentage of female owls that nested across the eight areas ranged from 0 to 95%, and the number of young fledged per area ranged from 0 to 39. The total number of young owls fledged was 166, markedly lower than the two previous years (492 in 2001 and 445 in 2002). Significant effort was devoted to developing models to predict survival, reproduction, and occupancy rates from habitat mosaics.

✓ **Marbled Murrelet monitoring** - The population of marbled murrelets residing in the range of the Plan was estimated to be 22,300, and the 95% confidence interval ranged from 18,300 to 26,300. Considerable effort was also devoted to developing habitat maps from plot and remotely sensed data.

✓ **Aquatic Riparian monitoring** - In 2003, 30 watersheds were sampled. Other accomplishments included refining the data collection protocols, conducting an intensive quality assessment and quality control program, holding a decision-support-model workshop, developing cooperative monitoring efforts, and beginning to explore alternative monitoring designs.

✓ **Social and Economic monitoring** - During 2003, four case-study clusters were completed. Each cluster comprises three communities and an associated federal forest. Researchers collected United States census data and interviewed community leaders and other stakeholders to better understand how local socioeconomic trends have related to changing federal forest management.

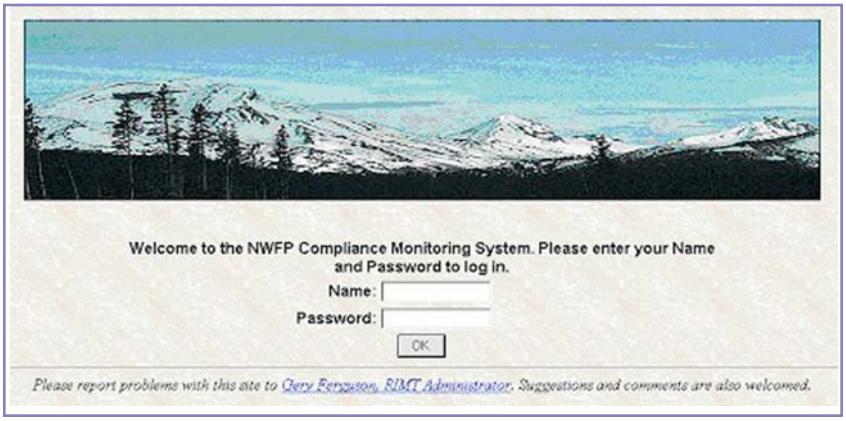
✓ **Tribal monitoring** - Five Tribes from throughout the Plan area provided responses to queries about the effectiveness of federal agency consultation in addressing treaty and other rights, access to and use of resources, and other interests. A tribal monitoring advisory group assisted with overall monitoring efforts.

Spotlight

Introduction

All historical results of compliance monitoring since 1996 have been entered into a new database and now, for the first time, results can easily be analyzed for the entire implementation monitoring effort since 1996. For example, the question, How many and what kinds of projects were monitored in each of the Plan's land-use allocations? can now be quickly answered.

The Oracle application includes a web-based interface so the leads of the Provincial Implementation Monitoring Team (the provincial team) can access project information, generate annual



questionnaires based on applicability of the standards for each project, record monitoring results, and access standard reports for each province. The data base also has standard regional-report templates that will facilitate completing the annual monitoring report for implementation monitoring for both the project and watershed-scale monitoring.

Deployment

Fiscal year 2004 will be the first year the provincial team leaders will access the data base. The data base can randomly select projects to be monitored based on criteria determined annually by the monitoring program managers. Use of the data base has already resulted in earlier selection of projects to be monitored as requested by provincial team leads. Also, the length of the questionnaires will be reduced and many inapplicable questions will be eliminated.

Results of the questionnaires will be recorded in the database through the intranet by each provincial team lead. Compliance results can be immediately determined by using standard reports both at the regional and provincial scales and the time for consolidating and analyzing results by the Regional Implementation Monitoring Team will be reduced.

Analysis

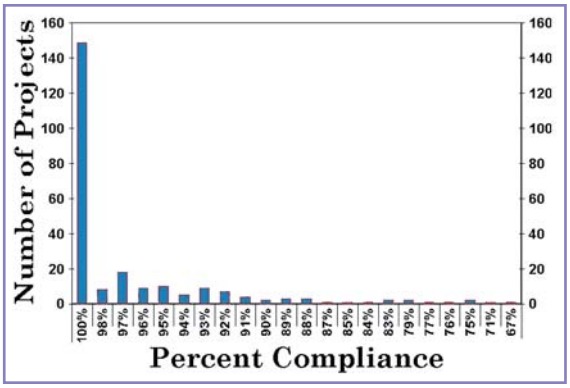
As the data base was being developed, historical information was also being entered. The results of 7 years of monitoring were analyzed to determine the top noncompliance standards and guides related to the number of applicable projects that were monitored. This analysis will be used in the 2004 interpretive report to identify standards and guides with specific implementation problems. In addition, numbers of projects monitored in each of the land use allocations were also determined along with numbers of people who actually attended the reviews.

Future Considerations

A future addition for the data base being considered is a spatial link tied to each watershed and project monitored to be able to map monitored projects and watersheds.

Applicability of the data base to other uses in other regions is also being investigated; because the data base was developed with flexibility to be used for other types of implementation monitoring. The data base could also be used to track implementation monitoring needed in association with Forest and Resource Management Plan Revisions for the Forest Service and Bureau of Land Management.

Regina Winkler demonstrates use of compliance-monitoring database.



Example output from database showing compliance for all 240 projects monitored 1996 thru 2003.

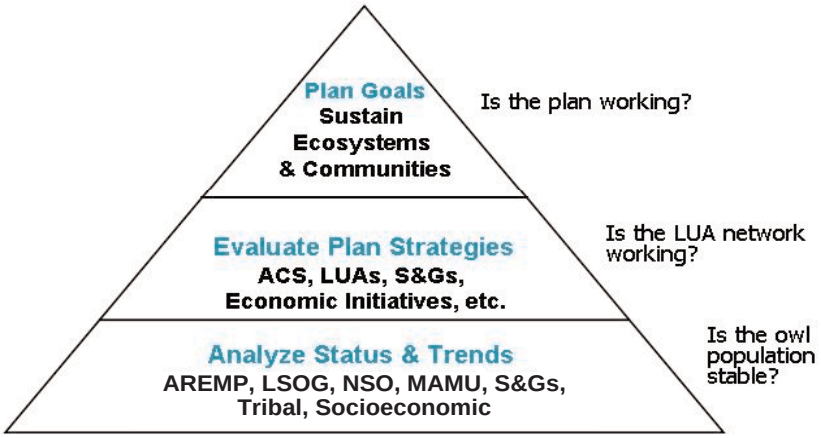
Program Management

Priorities

Priorities for 2003 included preparing for the 2004 interpretive report, refining monitoring approaches, and coordinating aquatic monitoring efforts across the region.

The 2004 Interpretive Report

The regional monitoring team continued to devote significant effort this year towards preparing a 10-year interpretive report with information critical to evaluating the success of the Plan. The 2004 interpretive report represents the first comprehensive evaluation of monitoring data and research since the 1994 record of decision was implemented (a 5-year evaluation was scheduled but never completed).



Framework for addressing questions in the 2004 interpretive report.

The objectives of the 2004 interpretive report are to provide an integrated, cross-disciplinary analysis of the Plan's effectiveness by using the best available research, monitoring, and management experience; and to provide the Regional Interagency Executive Committee with management implications.

Efforts to date have focused on summarizing Plan expectations, assumptions, objectives, key questions, and scope of analysis; acquiring GIS, satellite imagery, and other data; and finalizing work plans. Key data layers have been completed, including a map of existing late-successional and old-growth vegetation from remote-sensing data.

In addition to its importance to evaluating status and trends in vegetation, this map is being used to develop habitat suitability maps for northern spotted owls and marbled murrelets.

Refining Monitoring Strategies

The regional monitoring team continued to emphasize improving on-going monitoring efforts. Workgroups were held to consider future options for northern spotted owl monitoring. The watershed-condition module conducted workshops to refine decision-support models; the workshops were attended by more than seventy people. Tribal monitoring questions were reviewed and revised by the interagency tribal monitoring team and the newly established Tribal Monitoring Advisory Group.

Coordinating Aquatic Monitoring Efforts

A significant step was taken towards standardizing aquatic monitoring protocols across agencies in the region. Through the efforts of Steve Lanigan (watershed condition module lead) and others, a Pacific Northwest Aquatic Monitoring Partnership was formed between state, federal and tribal agencies. Workgroups are currently developing standardized protocols for monitoring watershed condition, fish populations, and data management.

Staffing

The regional monitoring team had few changes in personnel during 2003. Bruce Bingham accepted a position as the intermountain regional program manager for the inventory and monitoring program of the National Park Service. Also, Bruce Crespin of the BLM Oregon State Office is now the coordinator for the tribal module, leading tribal monitoring.

Budget

The approved monitoring-program budget for 2003 was $6.211 million (M): for implementation, $280 thousand (K); northern spotted owl, $2.449 M; vegetation, $697 K; marbled murrelet, $797 K; aquatic riparian, $1.007 M; socioeconomic, $383 K; biodiversity, $47 K; tribal, $58 K; and program management, $493 K. The budget chart (see page 3) shows the distribution of dollars by contributing agencies.

Budget

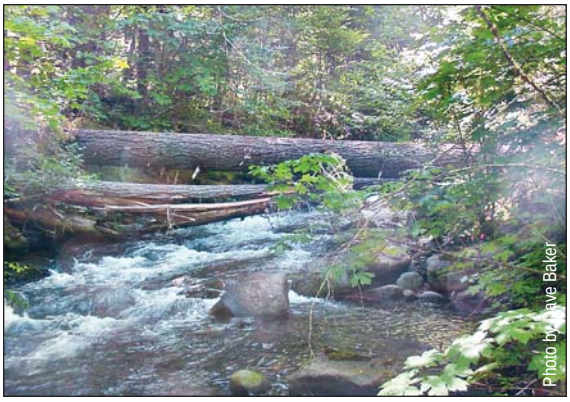
NWFP Monitoring - Priorities		Needs	Contributions										
			BLM	R-5	R-6	NPS	FWS	PNW	PSW	USGS	EPA	NMFS	Total
Program	Manager	110			110								110
	Asst. Mgr & GIS	240	65		110								175
	Contracts, 04 Rpt	340	73	65	70								208
	TOTAL	690	138	65	290	0	0	0	0	0	0	0	493
Implementation	Lead	110	110										110
	Regional IMT	160	40	30	60		30						160
	Info/Database	50	10										10
	Field Costs (24x5)	120											0
	MODULE TOTAL	440	160	30	60	0	30	0	0	0	0	0	280
NSO	Lead	60	60										60
	Demography	2177	693	317	896	140							2046
	Models/Maps	310		5	20		10	175		133			343
	Meta-analysis	80											0
	MODULE TOTAL	2627	753	322	916	140	10	175	0	133	0	0	2449
LSOG-VEG	Lead	114			114								114
	IVMP-PNW/RSL	106		25	81								106
	Veg. Change PNW	161		30	131								161
	IVMP contr., misc.	286	54		152								206
	FIA Add-ons – R5	110		110									110
	MODULE TOTAL	777	54	165	478	0	0	0	0	0	0	0	697
MaMu	Lead	110					110						110
	Population	654					251	191	110				552
	Habitat modeling	186			30		15		90				135
	MODULE TOTAL	950	0	0	30	0	376	191	200	0	0	0	797
Watershed	Lead	98			98								98
	Ops & GIS Staff	353	133	49	66								248
	DSM Development	291						66		66			132
	Wtrshed Sampling	1006		99	170						90	170	529
	MODULE TOTAL	1748	133	148	334	0	0	66	0	66	90	170	1007
Socio-econ	Lead	120			120								120
	Asst. GIS Tech	84		60	17								77
	Community Pilot	161	45	55	61								161
	Lab, Admin, Other	74		25									25
	MODULE TOTAL	439	45	140	198	0	0	0	0	0	0	0	383
Biodiversity	Plan	158						20		27			47
	MODULE TOTAL	158	0	0	0	0	0	20	0	27	0	0	47
Tribal	Analysis, rpt, misc	110											0
	Tribal Liaisons	45	20	10	15								45
	Travel	13	3	5	5								13
	MODULE TOTAL	168	23	15	20	0	0	0	0	0	0	0	58
Totals		**7997**	**1306**	**885**	**2326**	**140**	**416**	**452**	**200**	**226**	**90**	**170**	**6211**
	% contributed fy03		**21.0**	**14.2**	**37.4**	**2.3**	**6.7**	**7.3**	**3.2**	**3.6**	**1.4**	**2.7**	**100.0**

Implementation Monitoring . . . . . .

The summer of 2003 marked the eighth year of project monitoring and the fourth year of watershed-assessment monitoring. The program is structured to determine and document the extent of compliance with the standards and guides found in the Plan's record of decision.

The 2003 program was designed to sample 24 (two per planning province) randomly selected projects. Fifteen late-successional reserve density management projects, seven prescribed fire projects, and one mining project were reviewed. One additional density management project was selected to be monitored, but it was consumed by wildfire before the scheduled review.

The assessments for the 5th-field watersheds containing the projects were also monitored. Several of the projects were in the same watershed, which resulted in 21 assessments actually being reviewed.



Example of habitat restoration project in the Willamette Province.

Highlights

- ✓ Compliance for projects monitored remains high.
- ✓ Nineteen of the twenty-three projects were 100% compliant.
- ✓ Watershed analyses were completed for 19 of the 21 watersheds reviewed and four of the analyses had been updated.

View of Salmon Creek watershed, Willamette Province.

- ✓ Road mileages in watersheds were reduced since 1994. In eight key watersheds reviewed, the miles of road decommissioned were 4.5 times more than the miles of road built, and the 5th -field watersheds had 11 times more road miles decommissioned than built.
- ✓ Assessments were completed for all of the late-successional reserves in the sampled watersheds.
- ✓ The number of questions to be answered on each review was reduced by about 46% by removing the nonapplicable questions before issuing the questionnaires to the field units.
- ✓ Most projects and watershed assessments to be reviewed in 2004 were selected in the summer of 2003 to assist the field units in FY04 workload planning.

Unthinned stand reviewed by Willamette Provincial Advisory Committee.

Looking Ahead

The 2004 implementation monitoring program will continue to monitor 24 projects (2 per planning province) and associated 5th –field watersheds. The focus will be prescribed fire, grazing, mining and recreation projects.

The implementation monitoring data base will be deployed in 2004. Field units will generate their questionnaires and enter data (answers) electronically.

Future program options, recommendations for process improvements, and consistent areas of noncompliance will be addressed in the implementation monitoring portion of the 2004 interpretive report.

Example of coarse woody debris remaining after thinning and prescribed fire treatment, East Washington Cascades Province.

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Restoration project reviewed by West Washington Cascades Provincial Advisory Committee.

Compliance by individual categories identified in the project review questionnaire for 2003.

Questionnaire Categories	Number of Responses			Percent Compliance**
	Met	Not Met	Not Capable*	
All land-use allocations	101			100
Late-successional reserves and managed late-successional areas	231	4	12	98.4
Watershed analysis and aquatic conservation strategy and riparian reserves	301	5		98.4
Matrix	6		1	100
Adaptive management areas	18			100
Research	6			100
Species	43		7	100
Other project questions	18	2		90
Total of the 23 projects reviewed	**733**	**9**	**20**	**98.8**

* Not capable: physical site limitations prohibit true compliance or meeting the standard and guide (for example, no existing snags or lack of sufficient material for coarse woody debris).

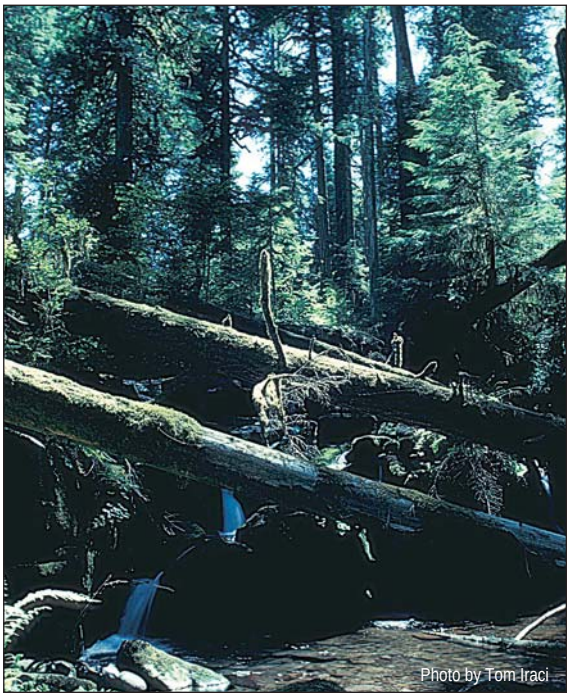
** Percent compliance = (number met + number not capable)/(number met + number not capable + number not met) x 100%. Responses of met and not capable were considered to have met the compliance criteria (from a biological perspective) associated with record of decision standards and guides.

Late-Successional & Old-Growth . . . . .

Our purpose in monitoring late-successional and old-growth forests is to assess the status and trends of older forests by evaluating their amount and spatial arrangement through time. Specific objectives are to map existing older forests, from remote sensing information; map their losses to fire and harvests using remotely sensed change detection; and produce periodic older forest estimates with statistical confidence intervals using data from repeated measurements on permanent inventory plots.

In 2003, we finished compiling the map and inventory data required to analyze the status and trends of older forests. We designed and began testing a statistical analysis of the inventory data for a range of older forest definitions, and used it to pilot an analysis of forest conditions in various fire disturbance regimes.

This pilot analysis was designed to help policy makers evaluate treatment opportunities and tradeoffs when designing management strategies for restoring and maintaining older forests in different types of fire risk classes. We also began compiling the maps of existing vegetation into forest classes and testing the resulting maps for accuracy of classes.



Bull Run Creek, Mt. Hood National Forest.

Highlights

Highlights of 2003 for our monitoring module include:

✓ Work on the interagency vegetation mapping project was completed to map existing vegetation in Washington and Oregon. Vegetation maps for California were reported completed last year. All data are posted for public use at http://www.or.blm.gov/gis/projects/ivmp.asp and http://www.fs.fed.us/r5/rsl/projects/mapping/accuracy.shtml.

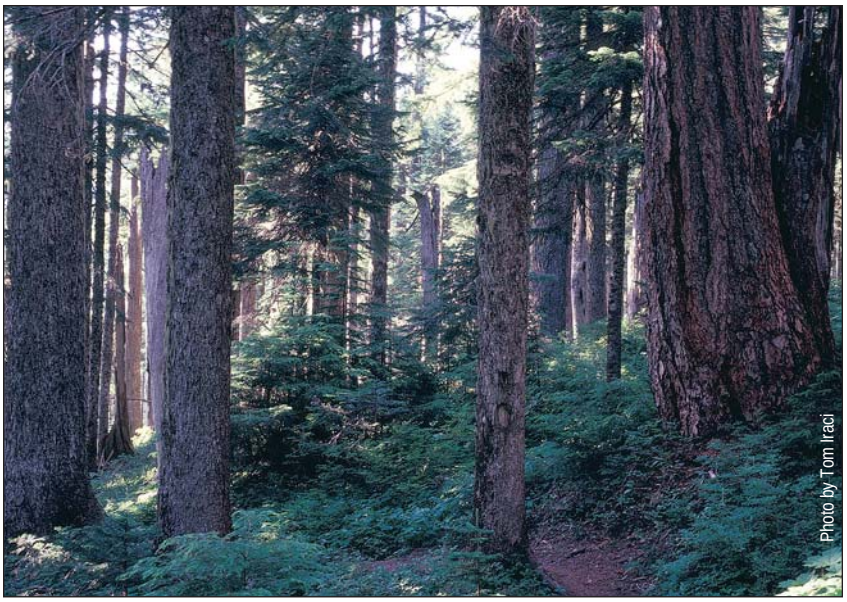
✓ We piloted the re-classification of IVMP map data representing size, canopy closure and structure, and species composition into forest vegetation classes, including older forests classes. To test the accuracy of the map of older forests, a process was designed to quantitatively compare mapped class values with actual class values by using inventory plots as reference data. Reporting map accuracies is considered essential to inform end users of its quality and, consequently, its suitability for intended uses.

✓ A set of analytical rules for a range of older-forest estimates based on a spectrum of definitions of "older forests" was developed and formally tested. These definitions range from most inclusive

Broken tops of emergent old-growth trees, Olympic National Forest.

(FEMAT's operational rule of 80 years +) to most exclusive (ecological old-growth definitions tailored to potential natural vegetation type and based on age, size, and additional stand structure attributes such as snags and down wood). Inclusive definitions will estimate more acres of older forests than will exclusive definitions.

This approach is designed to allow reporting of a logical range of older-forest estimates rather than one estimate based on a single definition that everyone may not agree is the best. A range of estimates based on this "coarse-filter, fine-filter" approach can help different recipients of the vegetation monitoring results understand the range of variability, and help expand the flexibility of interpretations associated with what different people consider older forest.



Older forest in the lowland western hemlock zone.

✓ We developed an approach for stratifying the older-forest analysis by fire disturbance regime. We used GIS tools to overlay inventory plot locations with a spatial data base of historical natural and current fire regimes (Hardy and others 2001), and then assessed the risk of current older-forest classes in the late-successional reserve network. This approach will help us emphasize the importance of considering the amounts and patterns of older forests in a landscape context in the trend analysis section of the 10-year monitoring report.

✓ In 2003, we brought the change-detection cycles in parts of the project area mapped by different teams into greater temporal coincidence. The change-detection team at the Pacific Northwest Research Station backdated the Washington change data to 1972 to make it more compatible with the Oregon data, which had previously been mapped beginning with 1972 data. Also, the Region 5 remote sensing lab updated change for California through 2003.

Previously, the latest change cycle in California was either 1996 for northeastern California or 1998 for the north coast. This change brought California into greater compatibility with Washington and Oregon, where the last change cycle is fall of 2002.

Range of older forests estimates based on the "coarse-filter/fine-filter" approach.

Older Forests Percent		
Definition 1 FEMAT—Age (80 + yrs)	Definition 2 FEMAT—Size (21+")	Definition 3 FS Interim OG (Large-tree density)
49	**25**	**10**

LSOG percent is the percent of total acres of federal land based on the following definition:

Definition 1: Mean age of top story trees ≥ 80 years (FEMAT age-based definition of older forests)

Definition 2: Quadratic mean diameter of top story trees ≥ 21 inches (FEMAT size-based definition of older forests)

Definition 3: Minimum density of trees ≥ DBH threshold, by potential natural vegetation [series] (modified from R5 and R6 interim old-growth definitions)

Looking Ahead

In 2004, all work will be directed toward analyzing the existing vegetation maps, change-detection data, and inventory plot data to report on the status and trends of late-successional and old-growth vegetation during the first 10 years of the Plan.

Contact Information

For more information on the Late-Successional and Old-Growth (LSOG) module contact:
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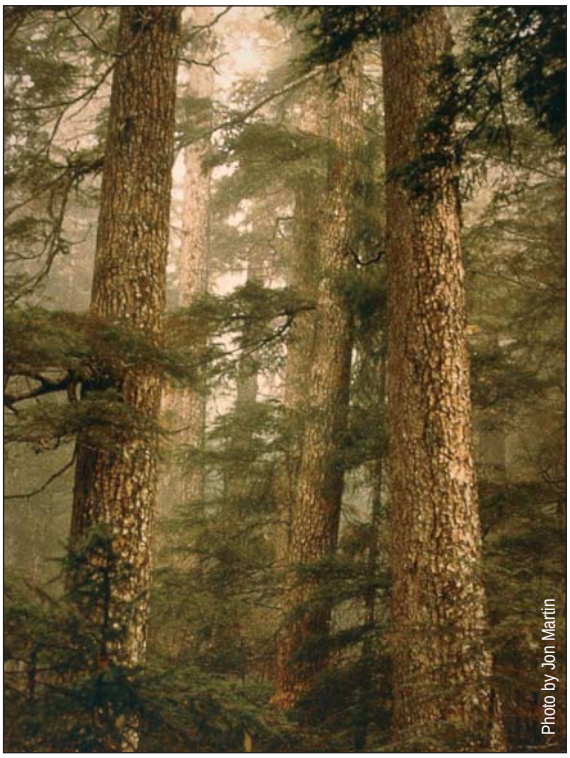
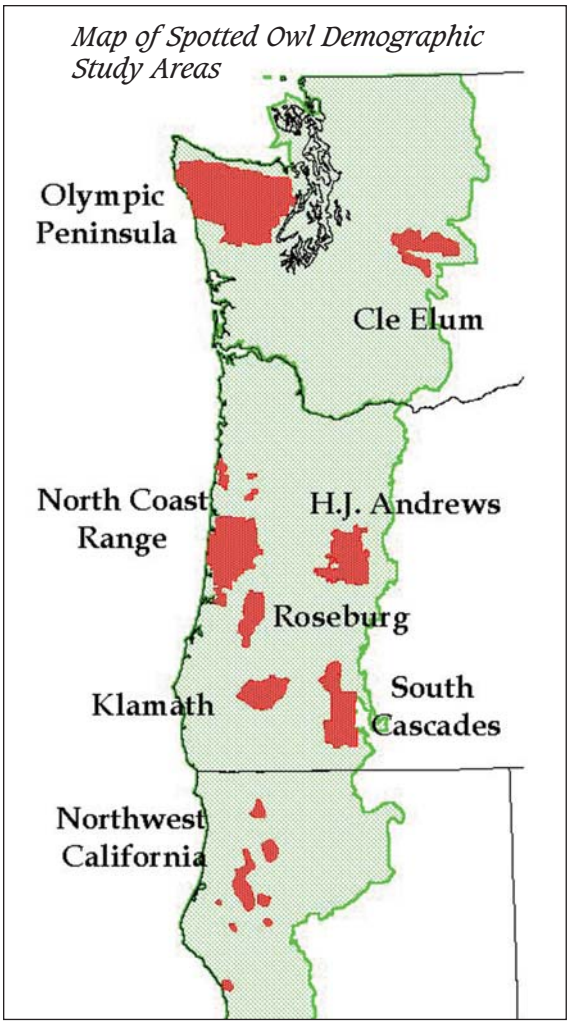


Complex canopy layering.

Northern Spotted Owl . . . . . .



Map of Spotted Owl Demographic Study Areas

Highlights

These monitoring results for the northern spotted owl are highlights noted during the tenth consecutive year of monitoring completed in 2003 under the Plan:

✓ More than 1200 sites, in eight demographic study areas, were surveyed to gather information on owl occupancy, survival, and reproduction. Spotted owl pairs were present at 47.2% of these sites, and 166 young were fledged. Pair occupancy has been relatively stable over the past three years, but the number of young fledged was markedly lower in 2003 than in the two previous years (492 in 2001 and 445 in 2002).

✓ Across the eight areas, the percentage of the female owls that nested ranged from 0 to 95.0%, and the number of young fledged per area ranged from 0 to 39.

✓ As in previous years, a high percentage (96%) of the owls fledged in 2003 were banded and released for future observation.

✓ Predictive model work focused on modeling occupancy in three demographic areas: Roseburg BLM, H.J. Andrews Experimental Forest, and the North Coast study areas.

✓ The primary tool for creating spatial maps of spotted owl habitat at the province scale will be Biomapper. It is a kit of GIS and statistical tools designed to build habitat suitability models and maps for plants and animals by using ecological niche factor analysis that computes habitat suitability models without species absence data [Hirzel, A.H., Hausser, J., Chessel, D., Perrin, N. 2002. Ecological-niche factor analysis: How to compute habitat-suitability maps without absence data? Ecology 83(7):2027-2036].

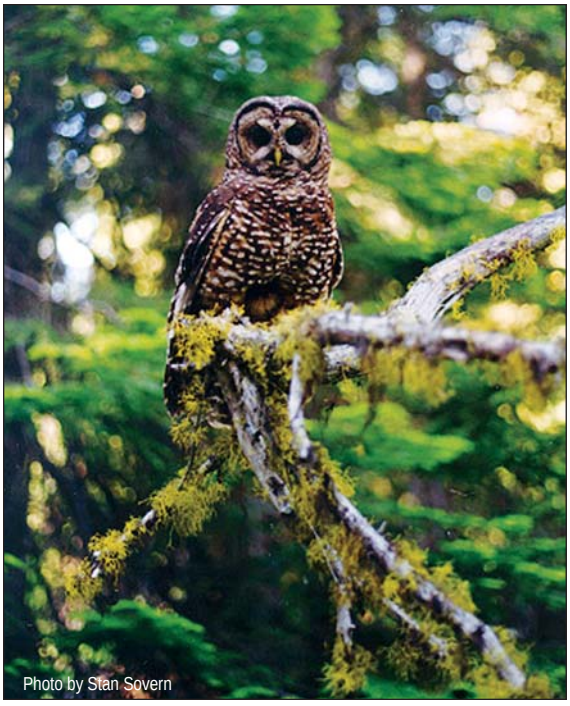


Photo by Stan Sovern

Adult spotted owl.

Summary of northern spotted owl occupancy and reproduction by demographic area for 2003. These are preliminary data; values may change in the final analysis.

Demographic area	Sites surveyed (number)	Sites with a territorial pair (number)	(%)	Females nesting (%)	Young fledged (number)
Olympic Peninsula	175	47	26.8	0.0	0
Cle Elum	67	22	32.8	95.0	29
H.J. Andrews	160	97	60.6	22.0	25
North coast	210	87	43.1	5.8	5
Roseburg	194	83	43.0	35.0	25
South Cascades Range	168	91	54.1	38.6	39
Klamath	155	96	61.9	48.3	39
Northwestern California	93	54	58.1	22.0	4
TOTALS	**1222**	**577**	**47.2**		**166**

Spotted owl focused on its prey.

Juvenile spotted owls

Looking Ahead

In 2004, demographic data will be analyzed to support the 2004 Interpretive Report. In addition to continued data-gathering efforts, the main focus will be completing the 10-year summary of northern spotted owl monitoring under the Plan. This report will summarize results from the population and habitat condition and trend analyses, as well as review progress to date on developing models to predict survival, reproduction, and occupancy rates from habitat mosaics.

Territorial pair of spotted owls.

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Marbled Murrelet . . . . . .

A pair of marbled murrelets.

The purpose of the effectiveness monitoring program for marbled murrelet is to assess population trends and to determine the characteristics and trends of suitable habitat in the Plan's area. Information gathered for this assessment is used to maintain and restore marbled murrelet habitat and populations on federally managed lands. The marbled murrelet was listed as a threatened species by the U.S. Fish and Wildlife Service in 1992 in Washington, Oregon, and California, and a recovery plan was published in 1997.

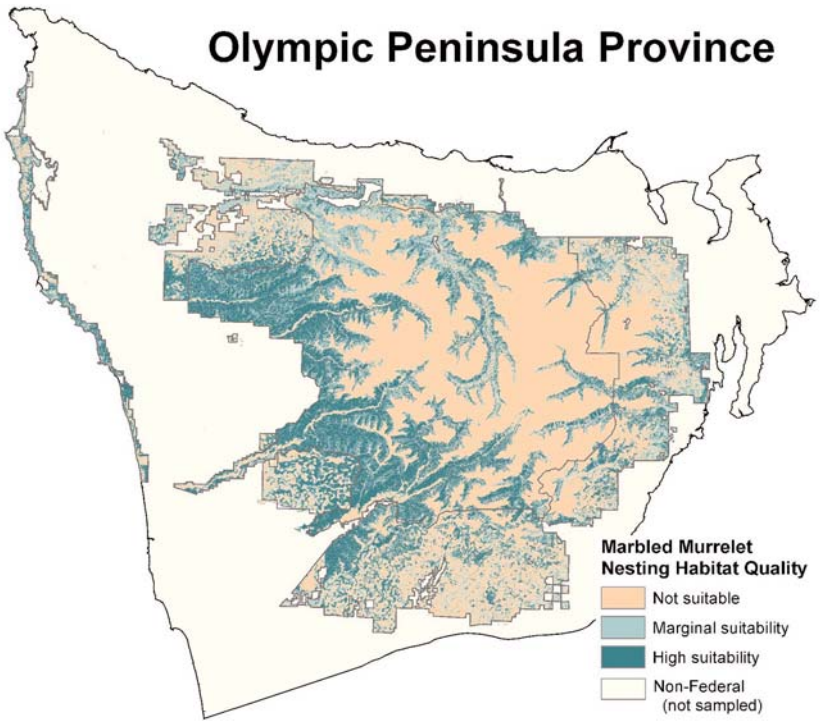
An effectiveness monitoring approach for marbled murrelet was developed in 1999, which proposed long-term monitoring of populations at sea and developing prediction models of nesting habitat. At-sea population surveys follow a unified sample design spanning the coastlines of Washington, Oregon, and California where the species is listed; this design covers five recovery conservation zones.

Marbled murrelets are counted by two observers on boats navigated to follow transect lines determined by a randomized sampling procedure. Transect survey counts and distances to birds are collected, and these data are analyzed to estimate the population and density of murrelets in the Plan area.

Habitat models, nonspatial (no map) and spatial (map), are used to estimate the amount and distribution of suitable habitat and to assess change in murrelet habitat over time. For the nonspatial model, a habitat-prediction equation is developed by using regression analysis. The habitat data used in the model are from plots surveyed for murrelet occupancy. Once developed, the habitat model is used to predict the likelihood of murrelet occupancy for locations in the Plan area where similar habitat data have been collected. Then, these predictions are used to determine the amount of habitat in the Plan area.

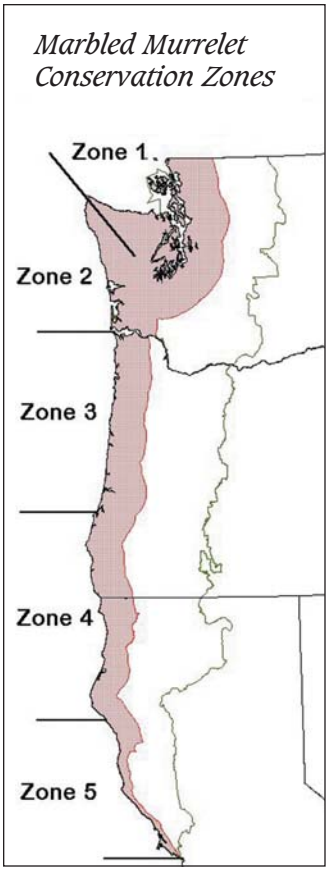
Researchers from the PNW Olympic Lab search for murrelets at night to capture them and then find their nests.

Three approaches are being taken to develop maps of murrelet habitat: they include a knowledge-based approach that uses a set



Preliminary results from mapping marbled murrelet habitat.

Marbled Murrelet Conservation Zones



of habitat variables preselected by experts to map habitat, thus providing a rapid approximation of the distribution of murrelet habitat; a statistical approach (factor analysis) that matches murrelet habitat characteristics from known locations to similar areas elsewhere within its range; and a second statistical approach like the nonmap method where habitat variables with the most predictive capabilities are selected, but only variables are used that can be mapped throughout the Plan area.

Highlights

Highlights of the effectiveness monitoring program for marbled murrelets include

✓ The fourth season of at-sea population monitoring was completed mid-May through July 2003, by using the unified design developed for the effectiveness monitoring program. (The 2003 population estimates are shown below.)

✓ Marbled murrelet density was highest in Zones 3 and 4, southern Oregon and northern California coast, and the lowest in Zone 5, California coast from the San Francisco Bay north through Mendocino County.

Marbled murrelets are sometimes encountered in large groups during at-sea transect surveys.

Summary of marbled murrelet population estimates for the 2003 breeding season pooled across all five conservation zones in the Plan area.

Variable	Estimate
Area sampled (km2)	8,810
Population estimate	22,300
95% confidence interval for population	+/- 4,000
Density (birds/km2)	2.5
Coefficient of variation of density (%)	9.2

✓ The largest number of marbled murrelets was in Zone 1, Puget Sound area, and the smallest in Zone 5.

✓ Preliminary habitat analyses using the knowledge-based approach are underway as shown here for the Olympic Province.

Looking Ahead

Statistically valid population-trend estimates are likely after about 8 to 10 years of annual monitoring surveys (survey years 2007 to 2009). Until valid trends can be projected, population estimates should be viewed as preliminary.

Population surveys are expected in the five conservation zones for the 2004 breeding season. Early forecasts of funding available to complete surveys in 2004 for all five conservation zones fall short. Consequently, the at-sea survey field design has been modified to reduce the sampling effort in Zone 5 by 50 percent. The projected cost for the 2004 field surveys across all zones is ~$525,000.

Habitat models will be developed and assessed in 2004 as part of the 10-year effectiveness monitoring report on the Plan

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Watershed Condition . . . . . .

The purpose of the watershed-condition monitoring module (also known as the Aquatic and Riparian Effectiveness Monitoring Program or AREMP) is to assess the status and trend of watershed attributes to determine if the Aquatic Conservation Strategy is achieving its goals of maintaining and restoring watersheds. Watershed-condition assessment consists of examining upslope, riparian, and stream conditions.

We are also working to develop ecosystem- management decision-support models to refine indicator interpretation; develop predictive models to improve the use of monitoring data; provide information for adaptive management by analyzing trends in watershed condition and identifying elements that result in poor watershed condition; and provide a framework for adaptive monitoring at the regional scale.

Highlights

Highlights of the watershed-condition monitoring module include

✓ We sampled 30 sixth-field watersheds in 2003, our second year of monitoring. Funding limitations prevented us from meeting our 50 watershed goal.

✓ We standardized protocols with the PacFish/InFish monitoring program -- also known as PIBO – for site layout, pool definition, and gradient. We also examined the effects of how attributes are calculated and concluded that longitudinal profile data do not improve the accuracy or repeatability of our pool, gradient, or sinuosity measurements, and consequently, longitudinal profiles will no longer be measured, which should produce substantial time savings during field surveys; that gradient, when calculated by using the change in water-surface elevation does not significantly differ from gradient calculated using the change in bed surface, so we will use water surface elevations to be consistent with PIBO and other monitoring programs; that, because we were unable to detect a relation between pool tail fines and various particle-size measurement metrics in sample sites, we will continue to characterize substrate by using both pool tail fines measurements and pebble counts.

A backpack elector-fisher was used to sample fishes and aquatic amphibians.

Microinvertebrates were collected at each sample site.

Cutthroat trout were found throughout the NWFP area.

✓ Decision-support models were developed for each of the seven aquatic provinces that contain federal lands in the Plan area. More than 70 people, representing seven federal and state agencies, participated in developing of the models. Evaluation curve values and indicator weights used in the models were developed and refined based on field data, published literature, and professional judgment.

✓ Progress was made in developing a landslide assessment to use in decision-support models. We held a workshop in which participants began developing an assessment protocol to be implemented by the monitoring program in 2005.

✓ During the 2003 field season, 1 site in each of 28 watersheds was resurveyed as part of our quality-assessment program. Results of the surveys showed general improvement in our ability to measure some attributes, as well as suggesting areas for improvement. We also revised the field-audit component of our quality-assessment program.

✓ Eleven sites sampled during 2002 were resurveyed in 2003 to assess data quality. Data from these sites will allow us to examine trends more quickly than waiting until all 250 watersheds are sampled before we do any repeat surveys.

✓ The watershed-condition team leader continued to lead cooperative monitoring efforts-- now known as the Pacific Northwest Aquatic Monitoring Partnership -- between state, federal, and tribal agencies in Washington, Oregon, California, and Idaho. Accomplishments included having several tribes join the

partnership; and five different workgroups (steering committee, watershed condition monitoring, fish population monitoring, effectiveness monitoring, and data management) worked together to produce a planning document that identifies proposed coordination products, timelines, and budgets. The partnership efforts received strong support during executive briefings throughout the Pacific Northwest.

✓ The anticipated costs for fully implementing the monitoring plan, based on sampling an average of 6 sites for each of the 50 watersheds sampled each year, is about $5,280 for each sample site. This amount is slightly lower than past estimates because of the assumption that we can save money by hiring Student Conservation Volunteers for our field crews in 2004.

Each person participated in a two week training session.

Looking Ahead

We are currently undergoing an internal program review; as a result, we have identified several strategies for meeting the program objectives, given available funding. These strategies range from collecting intensive data in 20 watersheds (that is, fewer watersheds, more measurements) to scaling back current data-collection efforts to sample 50 watersheds per year (more watersheds, fewer measurements). We have also identified multiple alternatives for scaling back our data collection efforts, including sampling fewer attributes, sampling fewer sites in watersheds, and sampling smaller watersheds (7th fields). We are working with statisticians from the Environmental Protection Agency to evaluate the best strategy for meeting our program goals and for collecting high-quality and useful data.

We will begin efforts to establish the relation between upslope and riparian attributes and in-channel conditions. This information will be used for several purposes: to expand our ability to collect information to all federally managed watersheds in the Plan area; to refine indicator selection and data interpretation; and to develop predictive relations between management activities and watershed condition to improve the use of monitoring data.

Watersheds monitored in 2003.

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Counting the amount of large wood was sometimes a "challenge."

Social & Economic . . . . . .

The Monitoring Requirement

The purpose of the social and economic monitoring module is to assess whether the social and economic goals of the Plan are being met. The module responds to two related monitoring questions set forth in the record of decision:

✓ Are predictable amounts of timber and nontimber forest resources available and being produced?

✓ Are local communities and economies experiencing positive or negative changes that may be associated with federal forest management?

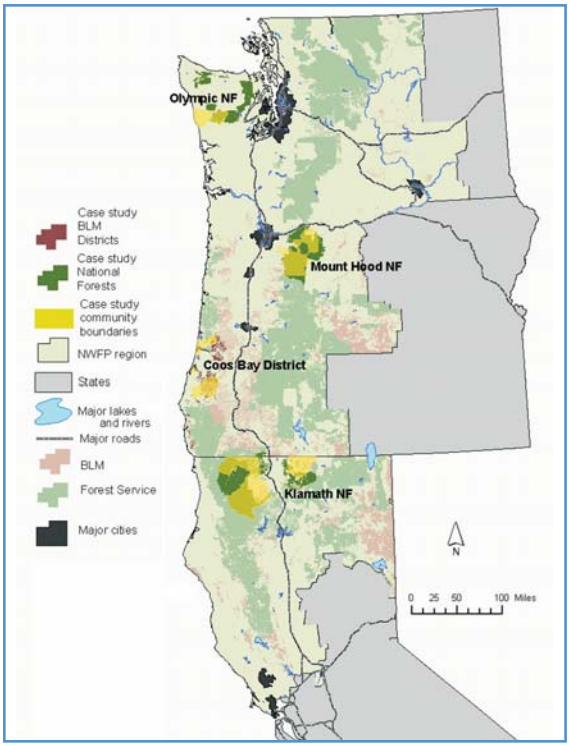
Primary data, collected during the monitoring fieldwork, and secondary data, existing in agency data bases and the relevant literature, will be used to evaluate the effectiveness of the Plan in these areas.

The Monitoring Pilot: Forest-Community Case Studies

During 2003, the monitoring team began a pilot phase of fieldwork in four federally managed Forests and their surrounding communities. The Forests were selected from each state in the Plan area, representing both the USDA Forest Service and the Bureau of Land Management. Selected were the Olympic National Forest in Washington, the Mt. Hood National Forest and the Coos Bay BLM District in Oregon, and the Klamath National Forest in California.

For each Forest, the monitoring team collected data describing trends in goods and services produced in implementing the Plan. Researchers also interviewed staff and decision-makers on each Forest, to better understand how these trends relate to the Plan.

Community project, Happy Camp, California.



Case study National Forests, BLM Districts and communities.

Three communities associated with each Forest were selected for study. Communities were delineated using a method developed by the Pacific Northwest Research Station (Donoghue 2003). Communities were selected based on factors including socioeconomic status before the Plan, geographic distribution around the Forest, and economic relations to the Forest. These communities were selected:

- Quilcene, Quinault-Neilton, and the Quinault Indian Nation (Washington), in association with the Olympic National Forest;
- The greater Estacada area, the villages of Mt. Hood, and the Upper Hood River Valley (Oregon), in association with the Mt. Hood National Forest;
- The greater Reedsport area, greater Myrtle Point, and North Bend-Coos Bay (Oregon), in association with the Coos Bay BLM District; and
- Butte Valley, Scott Valley, and the communities of the mid-Klamath River (California), in association with the Klamath National Forest.

For each community area, researchers collected United States Census data representing local socioeconomic trends from 1990 to 2000. Researchers also interviewed community leaders and stakeholders from each area, to better understand how local socioeconomic trends have related to changing federal Forest management.

Working with the Public

More than 280 local community leaders, stakeholders, and agency staff were interviewed in the pilot cases. Community members contributed valuable insights into the local effectiveness of the Plan. Local experts were able to identify factors both in and outside of the Plan that contributed to local change over the decade. Stakeholders described opportunities for participating agencies to strengthen their management effectiveness, particularly in working with local communities.

Region-Wide Data Collection

Other work during the year included collecting data describing trends in managing federal forests, services, and products across the Plan area. Data collected included information describing the availability of timber and nontimber forest products, grazing, minerals, and recreation. The monitoring team developed models to estimate jobs and income associated with the use of federal forest lands and programs for the area of the Plan, for each state, for the 12 planning provinces, and for each case-study county. Data describing trends in forest staffing and budgets were also assembled.

A variety of descriptive statistics were calculated to describe the regional forest contracting base, including the value and number of contracts, as well as the locations of contractors. Data were assembled to describe Rural Community Assistance Grants under the Northwest Economic Adjustment Initiative. Trends in payments to county governments in the Plan area were documented.

Secondary source material was assembled to provide a broader basis for evaluating the effectiveness of collaborative stewardship under the Plan. This literature included assessments of the effectiveness of Adaptive Management Areas and Provincial Advisory Committees. To further assist with this facet of the evaluation, the monitoring team surveyed data bases used to track volunteer and partnership programs, as well as partnership agreements. A body of literature was assembled to support evaluation of changing social values related to federal forest management.

Etna, California - a case study community.

Planned work during 2004 includes:

- Completing fieldwork for the pilot phase of forest-community case studies;
- Analyzing and documenting the results of the pilot phase of monitoring;
- Completing a second round of monitoring on and around the Okanagon-Wenatchee National Forest (Washington);
- Finalizing methods of analysis for Rural Community Assistance Grants and collaborative forest stewardship; and
- Completing the ten-year follow-up report assessing the social and economic effectiveness of the Plan.

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Literature Cited

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Tribal

American Indian tribal governments in the Pacific Northwest have rights and interests in the areas covered by the Plan. A total of 76 federally recognized Indian tribes are included, in portions of western Washington (27 tribes), western Oregon (7 tribes), and northwestern California (42 tribes).

Traditional willow acorn granary.

Traditional beargrass braiding.

The Forest Service and the Bureau of Land Management, as well as other federal agencies, are required to consult with these tribes on a "government-to-government" basis, to ensure that agency decisions give due consideration to tribal rights and interests (for example, treaty and nontreaty fishing and water rights, or general access to culturally important places). The record of decision for the Plan established federal agency commitments to monitor "tribal consultation effectiveness" and the effects of the Plan on tribal rights, interests, and access to lands and resources in federal forests.

Two key issues are to be addressed by this monitoring module:

- Are federal land managers consulting with Indian tribes on a government-to-government basis? (implementation)
- Are the tribes able to access resources to exercise their treaty and other rights and interests? (effectiveness)

Results of the tribal monitoring will be used to describe federal-tribal relations across the Pacific Northwest over time, and to provide feedback for improving them. Findings may indicate potential opportunities to enhance working relations, collaborating, or both, and could lead to improved management decisions.

Highlights

The tribal monitoring advisory group was reactivated early in 2003, as requested to the regional interagency executive committee by members of the previous interagency advisory committee (IAC) tribal effectiveness monitoring subcommittee (also called the IAC subgroup for tribal monitoring) and other interested parties. They provide tribal views on implementing the Plan and related activities, and, in particular, advise and assist the interagency tribal monitoring team to accomplish their objectives.

An orientation meeting and three working meetings were held in 2003, to coincide with regularly scheduled IAC meeting dates. Working relationships between the advisory group and the interagency team have been established and reinforced, in accordance with the group's Charter that was collaboratively developed.

Tribal monitoring methods have been refined to incorporate the advisory group's advice, which has also been afforded on other related issues, such as tribal monitoring costs and tribal sector in-kind contributions.

A full-time coordinator for the tribal monitoring module was put in place to direct overall interagency tribal monitoring activities for the Plan.

The tribal monitoring module was implemented in 2003, supplementing the initial efforts to use the monitoring protocol and questionnaire in 2002. In 2003, five tribal governments (+) were receptive to meeting with us; they responded to our monitoring questions in government-to-government interview sessions, adding to the monitoring of eight tribes in 2002 (~):

~Bear River Band of the Rohnerville Rancheria (CA)
~Blue Lake Rancheria (CA)
~Confederated Tribes of the Grand Ronde Community of Oregon (OR)
~Coquille Indian tribes (OR)
+Hoopa Valley Tribe (CA)

~Karuk Tribe of California (CA)
~Lower Elwha Tribal Community (WA)
+Lummi Tribe (WA)
~Quinault Tribe (WA)
~Round Valley Indian Tribes (CA)
+Table Bluff Reservation – Wiyot Tribe (CA)
+Upper Lake Band of Pomo Indians (CA)
+Yurok Tribe (CA)

Initial monitoring efforts with eight tribal governments in 2002 were reviewed this year by the interagency tribal monitoring team and the reinstated advisory group. The current questionnaire of 14 composite questions, in use since 2003, incorporates refinements in approach and modifications to improve the initial monitoring questions.

The tribal monitoring webpage section of the Regional Ecosystem Office (REO) website is supplemented with monitoring program and staffing updates, and additional links to federal-agency tribal-consultation directives. Key text references are posted such as the current tribal monitoring module questionnaire and the original pilot study report on developing the tribal monitoring protocol (see www.reo.gov/monitoring/tribal).

Lessons Learned

✓ Tribes prefer lessened timber harvests under the Plan to previous high harvest levels.

✓ Relationships with FS and BLM have improved over the past decade. Consultation is more frequent, more informative, and timelier than before.

✓ Consultation is usually relegated to providing information, but not necessarily to resolving issues of concern to tribes.

✓ Federal agency processes for government-to-government consultation are inconsistent, and are not uniformly applied throughout the organizational levels and regions of an agency.

✓ Tribes want their priorities to be considered as intensively as federal agency interests. Tribal leaders may not actively participate in consultations, if issues of priority to them do not receive serious consideration. There should be "meat on the bones" to keep the interests of top tribal officials.

Traditional ceremonial roundhouse.

Repairing traditional Hoopa baby basket.

Looking Ahead

The tribal monitoring module plans to interview about 30-40 additional tribal governments by the close of 2004, with the remaining tribal interviews to be scheduled in 2005, to accomplish Plan monitoring with the targeted 76 tribes.

The Plan's 2004 interpretive report will include a section on the background, developing, and implementing the tribal monitoring module, including methods, initial findings, and related materials.

The tribal monitoring module webpage on the Regional Ecosystem Office internet website will continue to be supplemented with information about Plan tribal monitoring protocols, tribal participants and locations, and relevant reference materials.

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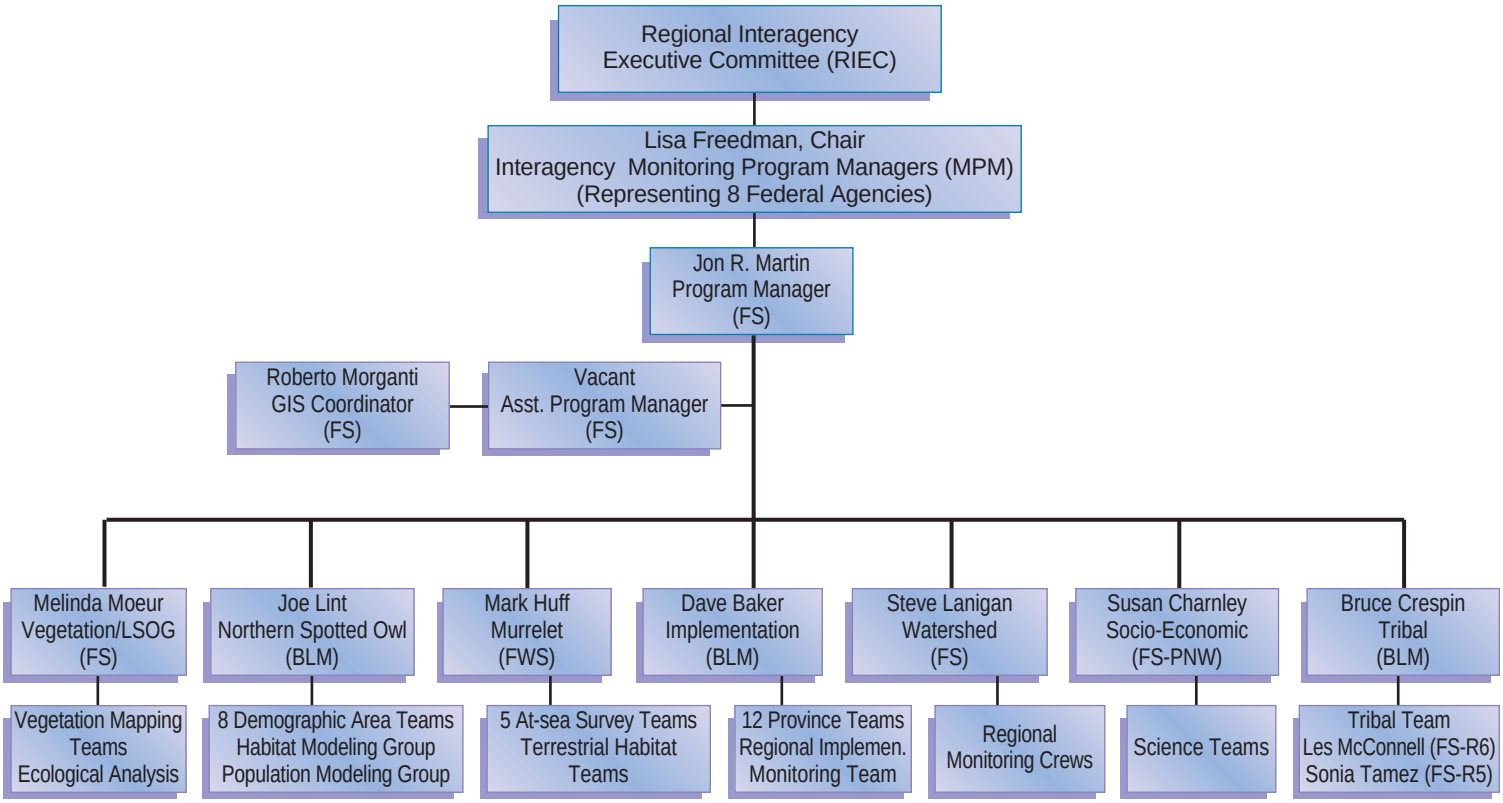

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