

# Annual Report 2001

## Interagency Regional Monitoring



## Northwest Forest Plan July 2002



# Summary

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Eight federal agencies have developed an implementation and effectiveness monitoring program encompassing over 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 important regional-scale questions about older forests, listed species (northern spotted owls, marbled murrelets), watershed condition, relations between federal agencies and Tribes, changing socio-economic 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 Northwest Forest Plan (NWFP) in achieving the objectives of:

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

This report summarizes program management (pages 1-2) and budgets (page 3), and provides an overview of progress by each component of the monitoring program (pages 4-16). Accomplishments during the 2001 field season are highlighted, and the direction for future activities is described. The report concludes with a list of participants (pages 17-19) and recent reports (pages 20-22).

Highlights from the report include the following monitoring efforts:

- **Implementation**--Overall compliance in meeting Northwest Forest Plan and Record of Decision standards and guidelines was 98% for the 21 projects and watersheds monitored (see pages 4-5).
- **Late-successional and old-growth**--In 2001, major progress in LSOG monitoring was made toward completing an existing vegetation map layer, launching change-detection work, and beginning the assembly and analysis of grid-plot-inventory databases (see pages 6-7).
- **Northern spotted owls**--The percentage of female owls that nested across the eight areas ranged from 20 to 84.8%, and the number of young fledged per area ranged from 16 to 109. The total number of young fledged was 492, up 30% from the 2000 season (see pages 8-9).
- **Marbled murrelets**--The population of marbled murrelets residing in the range of the Plan was estimated to be 21,200, and the 95% confidence interval ranged from 16,000 to 26,400 (see pages 10-11).
- **Aquatic riparian**--A pilot project in 2001 in 16 watersheds continued refining the data-collection protocols and answering other questions related to implementing the monitoring plan (see pages 12-13).
- **Social and economic**--During 2001, a Phase I report was completed that reviews available information and recommends developing a community-scale model and data-collection strategy (see page 14).
- **Tribal**--A proposal was developed by an interagency workgroup to monitor tribal relationships and resource concerns of the 76 tribes in the Plan area (see page 15).
- **Monitoring Spotlight**--Increasing numbers of barred owls have been found in northern spotted owl demographic study areas (see page 16).

# Program Management

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Program management priorities for 2001 focused on staffing key positions, resolving the 2001 and forecasting the 2002 budgets, and establishing program direction from the Regional Interagency Executive Committee (RIEC) and the Interagency Monitoring Program Managers (MPM).

The RIEC approved the MPM-recommended priorities and budget. In addition, they requested (Sept. 5, 2001) that we pursue developing a watershed monitoring partnership with California, Oregon, and Washington and concurrently conduct a review of the northern spotted owl program.

The MPM and the Regional Monitoring Team participated in a business requirements workshop (June 19, 2001) to establish program priorities for the implementation phase of this program. The workshop addressed success measures, critical program clients, stakeholders, communication, products, operational procedures and monitoring issues like adaptive management and the relation of regional scale monitoring to local- and project-scale efforts. The workshop provided direction for near and long-term program implementation.

## Program Priorities

1. Program priorities were established by the MPM and RIEC. Module accomplishments are discussed in the following pages. The priorities were to:
  - Ensure that RIEC-approved monitoring is implemented as intended in a cost-effective manner.
  - Complete the development of the tribal and socio-economic monitoring modules.
  - Complete a scientifically credible 10-year evaluation of the effectiveness of the Plan according to the approved regional monitoring framework.
  - Join forces with Washington, California, and Oregon state agencies and PACFISH to develop a unified regional monitoring approach for state and federal watershed monitoring.
  - Conduct a science-management review of the northern spotted owl monitoring program to improve efficiency and effectiveness of the monitoring program.
  - Conduct an assessment of the past 5-years of implementation monitoring activities and develop a strategy for the next 5 years.
  - Improve the integration of monitoring information in decision-making to enhance adaptive management.
  - Initiate information and decision-support needs assessments to assist in information management development.

## The 2004 Interpretive Report

Interpretive reports are produced on 5-year intervals and provide information critical to evaluating the effectiveness of the Northwest Forest Plan in achieving management goals. The first report is scheduled for 2004 and will report monitoring results on status and trends 10 years after implementation of the Northwest Forest Plan. There are few existing examples of interpretive reports for effectiveness monitoring. During 2001 the Regional Monitoring Team began to define the process for producing reports including a draft outline, milestones, and schedule. The Regional Monitoring Team expects to have the process defined and well documented, including detailed outlines for each section and detailed work plans for each module by August 2002.

# Program Management (continued)

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## Staffing

Three lead positions were filled: old-growth (LSOG), watershed (AREMP), and the information manager. The marbled murrelet (MAMU) lead transferred to Hawaii and a replacement was hired. The Aquatic Riparian (AREMP) module lead position was filled by an acting. Filling the socioeconomic and tribal leads will be delayed until the protocols are completed and approved by the RIEC (see organization chart on page 17).

## Information Resources

The monitoring program initiated an analysis of information and decision support needs in 2001. Documenting the monitoring questions, data and information requirements, and analysis needs has helped the program plan for the production of the 2004 interpretive report, its current highest priority. The Interagency Resource Information Coordinating Committee (IRICC) and the Regional Ecosystems Office (REO) GIS staff participated in the analysis and continue to assist with the monitoring programs efforts to develop and implement a long-term information management strategy. Requirements for a GIS interface tool that supports analysis and spatial summary of Current Vegetation Survey (CVS) and Forest Inventory and Analysis (FIA) data were defined. Funding was approved for a proof of concept application to be developed in 2002.

## Other Highlights

- RIEC approved the AREMP module and directed the MPM to implement.
- MPM met frequently (about every six weeks) with the RMT to ensure this interagency program was effectively implemented and funded.
- Based on RIEC priorities the northern spotted owl module was fully funded for FY02 and FY03.
- AREMP was only partially funded for FY02 pending results of partnership possibilities with the 3 states (first ever meeting with three states held in November 2001).
- Excellent progress was made in outlining scope, timeline, and work plans for completing the ten-year interpretive report.
- Adaptive Management: A team from PNW, OSU, and management agencies was formed to explore ways to improve our understanding and processes for integrating the results of monitoring into the decision-making process.

## Budget

The approved monitoring program budget for 2001 was \$5.96 million (M); Implementation – \$239 thousand (K); Northern spotted owl – \$2.40M; LSOG – \$411K; Marbled murrelet – \$1.19M; Aquatic Riparian – \$1.43M; Socioeconomic – \$140K; Biodiversity – \$35K; Tribal – \$10K; and Program and information management – \$165K. Contributing agencies were the Bureau of Land Management, Forest Service Regions 5 and 6, National Park Service, US Fish and Wildlife Service, Pacific Northwest Research Station, Pacific Southwest Research Station, US Geological Survey, US Environmental Protection Agency, National Marine Fisheries Service, and the Washington State Department of Natural Resources (see budget chart).

The budget request for 2002 was \$7.45M (Sept. 5, 2001 RIEC meeting) and the approved (Dec. 4, 2002 RIEC meeting) budget for 2002 was \$6.30M. Allocations for all module budgets were reduced except Northern Spotted Owl. Northern Spotted Owl was increased slightly (\$2.5M) to maintain fieldwork at all eight demography study areas.

## BUDGET - NWFP INTERAGENCY MONITORING PROGRAM

NWFP Monitoring - Priorities		Needs	Contribution										Total		
			BLM	R-5	R-6	NPS	FWS	PNW	PSW	USGS	EPA	NMFS		WDNR	
Program	Manager	115			115										115
	Info Mgr	50			50										50
	<b>TOTAL</b>	165	0	0	165	0	0	0	0	0	0	0	0	0	165
Implementation	Lead	109	109												109
	Regional IMT	130	40	30	30		30								130
	<b>MODULE TOTAL</b>	239	149	30	30	0	30	0	0	0	0	0	0	0	239
NSO	Lead	60	60												60
	Demography	2099	600	415	944	140									2099
	Predictive models	239						139		100					239
	<b>MODULE TOTAL</b>	2398	660	415	944	140	0	139	0	100	0	0	0	0	2398
LSOG/IVMP	Lead	100			100										100
	Remote Sens. PNW	70			70										70
	GIS/Analyst	40			40										40
	IVMP contr., misc.	201	64		137										201
	<b>MODULE TOTAL</b>	411	64	0	347	0	0	0	0	0	0	0	0	0	411
MaMu	Lead	100					100								100
	Population	613	40				251	157	90					75	613
	Habitat modeling	266		70			15	92	89						266
	Vegetation Plots	250	160												160
	<b>MODULE TOTAL</b>	1229	200	70	0	0	366	249	179	0	0	0	75	75	1139
AREMP	Lead	90			90										90
	Analytical Frmwrk	202						89		55					144
	Watershed Sampling	1,203	200	259	424	50					80				1013
	Aquatic Verts.	179								79		100			179
	<b>MODULE TOTAL</b>	1674	200	259	514	50	0	89	0	134	80	100	0	0	1426
Socio-econ	Status Report	140			50			90							140
	<b>MODULE TOTAL</b>	140	0	0	50	0	0	90	0	0	0	0	0	0	140
Biodiversity	Plan	35						35							35
	<b>MODULE TOTAL</b>	35	0	0	0	0	0	35	0	0	0	0	0	0	35
Tribal	Implement Phase I	100									10				10
	Analysis/reporting														0
	<b>MODULE TOTAL</b>	100	0	0	0	0	0	0	0	0	10	0	0	10	
<b>Totals</b>		<b>6391</b>	<b>1273</b>	<b>774</b>	<b>2050</b>	<b>190</b>	<b>396</b>	<b>602</b>	<b>179</b>	<b>234</b>	<b>90</b>	<b>100</b>	<b>75</b>		<b>5888</b>
	% contributed fy01		<b>21.6</b>	<b>13.1</b>	<b>34.8</b>	<b>3.2</b>	<b>6.7</b>	<b>10.2</b>	<b>3.0</b>	<b>4.0</b>	<b>1.5</b>	<b>1.7</b>			<b>100.0</b>

# Implementation Monitoring

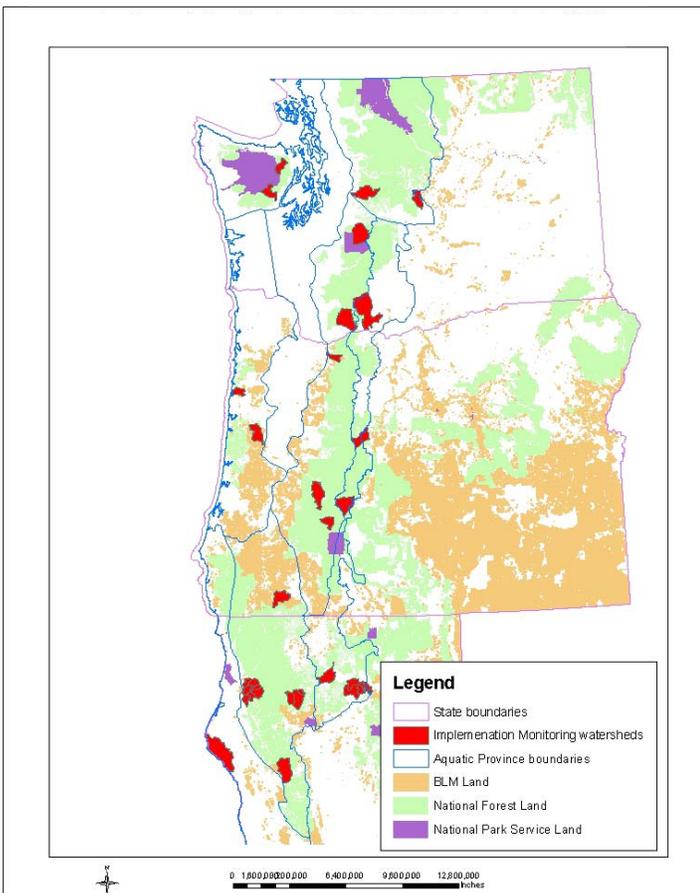
The 2001 field season marked the 6<sup>th</sup> consecutive year of the Northwest Forest Plan implementation monitoring program. This program is designed to determine whether the Record of Decision and its corresponding Standards and Guides are consistently followed across the range of the Plan. The 2001 program was designed to sample 24 randomly selected 5<sup>th</sup>-field watersheds (2 per province) and 24 specific projects (1 per randomly selected watershed). The fire season and subsequent rehabilitation efforts, however, prevented monitoring three watersheds and associated projects in eastern Washington.

The projects monitored were in several land-use allocations (Table 1). Each project dealt with activities related to fuel reduction, roads, special forest products, cellular site development, river deflectors or timber sales. Standardized questionnaires were used to determine whether the watershed-scale assessments and projects were meeting the Standards and Guides provided in the Record of Decision.

## Highlights

As in previous years, the results from both the watershed-scale monitoring and the project reviews indicate a high degree of compliance with meeting the Standards and Guidelines. Highlights from the watershed-scale monitoring include the following:

### Implementation Monitoring Fifth Field Watersheds for 2001



- Watershed analyses were completed for 18 of 21 watersheds, and three of these analyses had been updated;
- Riparian reserve widths had not been modified in any of the watersheds;
- Road mileages were reduced, since 1994, 11% in key watersheds (12) and 6.9% in 5<sup>th</sup> field watersheds (15);
- Assessments were completed for all of the late-successional reserves (19) in the sampled watersheds;
- Project review results showed general compliance of 98 percent with Standards and Guides. The compliance of the 21 projects reviewed ranged from 91 to 100% with 13 projects being 100% compliant;
- Negative biological effects associated with instances of noncompliance appeared to be minimal at the regional scale. Where noncompliance was found, the local effects were judged to be generally low to moderate;
- In FY01, implementation monitoring was requested to collect information for the Survey and Manage Program in order to determine compliance with meeting the Standards and Guidelines contained in the

Survey and Manage Record of Decision. Eighteen watersheds contained Known Sites and existing Species' Management Recommendations were used to manage these sites.

**Table 1. Compliance by individual categories identified in the project review questionnaire**

Categories in the questionnaire	Number of responses			Percentage compliance**
	Met	Not met	Not capable*	
All land use allocations	95	1		99
Late-successional reserves and managed late-successional reserves	85	4		96
Aquatic conservation strategy, watershed analysis, and riparian reserves	312	2		99
Matrix	54	2	3	97
Adaptive management areas	18	1		95
Research	6			100
Species	28		4	100
Total of the 21 projects reviewed	598	10	7	98

\* Not Capable: Physical site limitations prohibit true compliance or meeting the Standard and Guideline (e.g.- no existing snags or lack of sufficient material for coarse woody debris).

\*\* Percentage 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.

## Looking Ahead

Although room for improvement exists, none of the deficiencies noted in this report warrant recommending major corrective actions or operational shifts by land management agencies. Local Forest Service and Bureau of Land Management units are aware of specific, local noncompliance findings and are expected to take corrective action. Several have already done so.

Several programmatic actions called for in the Record of Decision have yet to be accomplished. These include addressing roads in riparian reserves for compliance with aquatic conservation objectives and evaluating and mitigating existing recreation facilities in riparian reserves. These deficiencies point to the need for clarifying or adding direction from the agencies, the Regional Ecosystem Office, or both.

## Contact Information

For more information on implementation monitoring contact:

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Website: [www.reo.gov/monitoring/implementation](http://www.reo.gov/monitoring/implementation)

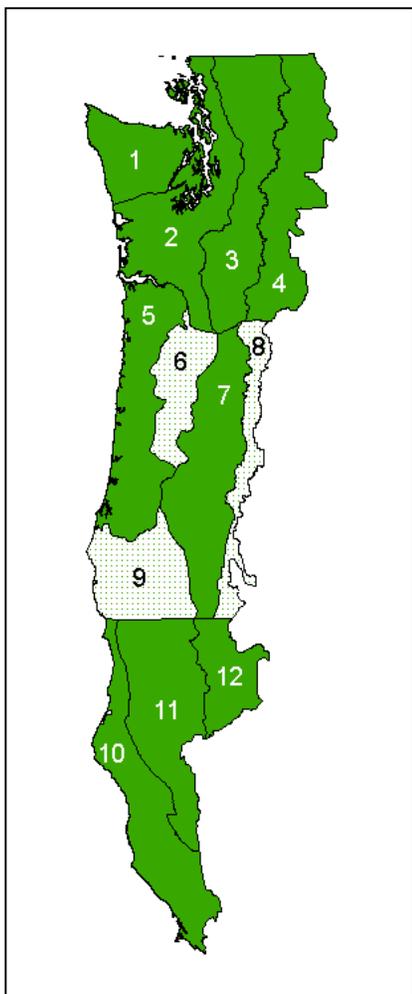
# Late-successional and Old-growth

The purpose of the late-successional and old-growth effectiveness monitoring module is to assess the status and trends of these forests to determine if the Plan will achieve its planned goals and objectives for protecting and enhancing late-successional and old-growth forest and related species on Federal lands in the range of the northern spotted owl.

Major components of this monitoring module are to:

- Map existing forest vegetation from remote sensing to generate consistent coverages for the Plan area. Canopy cover, tree size, and stand structure are mapped within physiographic provinces by the interagency vegetation mapping project (IVMP) in Oregon and Washington, and CALVEG in California. Forest vegetation maps will be analyzed to evaluate the acreages and distribution (stand size and arrangement) of late-successional and old-growth forests.
- Conduct statistical analysis of stand-scale inventory data to provide information about structural attributes and composition that remote sensing cannot detect. Inventory data can also be used to report acres of late-successional and old-growth forests at regional scales with a known degree of statistical reliability. Relating mapped vegetation attributes and sample-based measurements can help to describe structural conditions of vegetated landscapes at regional scales. Field data for monitoring is from the Forest Inventory and Analysis program (FIA) and the Current Vegetation Survey (CVS).

## Completion status of existing vegetation maps by physiographic province



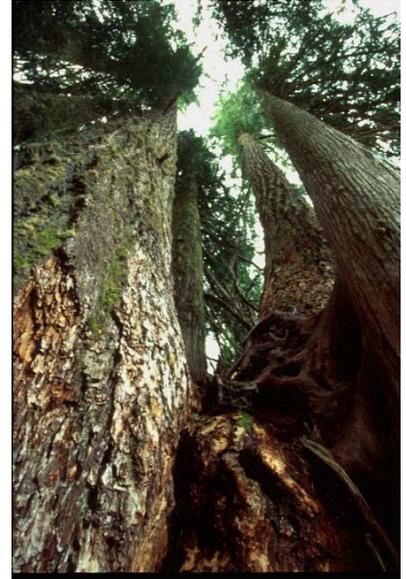
- Monitoring for trends requires establishing baseline conditions, and a means of tracking changes from the baseline. Change detection tracks losses and gains in forest conditions from a variety of sources—management, natural succession, wildfire, insects, and diseases. Remote sensing change detection will be used to track large-scale changes (stand-replacing disturbances) at periodic intervals (about every 5 years).

<u>Physiographic Province</u>	<u>Status</u>
1. Washington Olympic Peninsula	Complete
2. Washington Western Lowlands	Complete
3. Washington Western Cascades	Complete
4. Washington Eastern Cascades	Complete
5. Oregon Coast Range	Complete
6. Oregon Willamette Valley	Dec 2002
7. Oregon Western Cascades	Complete
8. Oregon Eastern Cascades	Aug 2002
9. Oregon Klamath	Oct 2002
10. California Coast Range	Complete
11. California Klamath	Complete
12. California Cascades	Complete

## Highlights

- Existing vegetation maps have been completed for 9 of 12 provinces, with a target completion date of December 31, 2002, for all provinces.
- Statistical analysis was piloted for the current vegetation survey databases for classifying inventory plots based on plot and tree-list attributes into late-successional and old-growth classes. A unified approach to incorporate FIA data is being developed.
- A remote-sensing change detection program was initiated in Oregon and Washington. The first map update incorporating 5-yr change has been completed for the 3 California provinces.
- The year 2001 marked a major milestone for the late-successional and old-growth monitoring program's planning and development. A module leader was hired in December 2000. An implementation strategy was prepared to plot an overall approach to monitoring these forests. The implementation strategy discusses short- and long-term program objectives, major analytic approaches, a course for benchmarking progress, and annual and periodic reporting of the monitoring, and program management needs, such as staffing and budgeting.

**Old-growth forests in the Northwest Forest Plan area typically display a multi-layered, multi-species canopy dominated by large overstory trees.**



Tom Kogut

## Looking Ahead

Full-scale analysis will begin in FY 2002 using vegetation maps completed and analytical approaches developed in FY 2001. The late-successional and old-growth chapter of the 2004 monitoring interpretive report will contain a complete analysis of baseline conditions summarized from existing vegetation maps and from first-occasion grid-plot inventory data. It will also contain a first approximation of trends (observed changes from baseline condition) using available updated map and inventory information. It will address interpretive links between monitoring results and the expectations of the plan to address management-related questions, such as the efficacy of the late-successional reserve network.

This monitoring module will provide technical consultation for spatial and map analysis for the other monitoring modules (especially the northern spotted owl, marbled murrelet, and watershed monitoring). The late-successional and old-growth module will develop pilot approaches and provide guidance for developing rule sets and image processing techniques for deriving data on owl habitat, murrelet habitat, and watershed vegetation conditions from the IVMP, CALVEG, and other map data.

## Contact Information

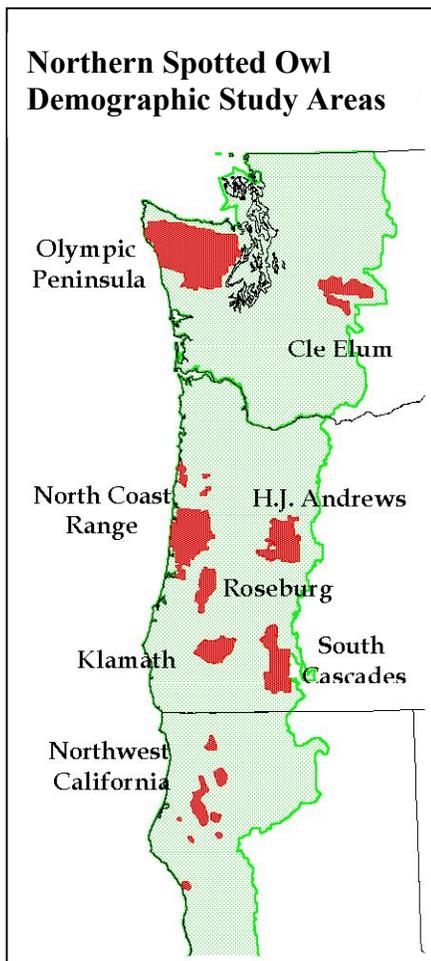
For more information on the Late-successional and Old-growth Module contact:

Melinda Moeur, LSOG Module Leader, USDA Forest Service, 333 SW First Ave., PO Box 3623, Portland, OR 97208-3623, 503-808-2811; Email: [mmoeur@fs.fed.us](mailto:mmoeur@fs.fed.us)

Website: [www.reo.gov/monitoring/og](http://www.reo.gov/monitoring/og)

# Northern Spotted Owl

The 2001 field season marked the 8<sup>th</sup> year of monitoring the population of northern spotted owls (*Strix occidentalis caurina*) under the Northwest Forest Plan. The purpose of the northern spotted owl effectiveness monitoring plan is to assess trends in spotted owl populations and their habitat relative to meeting the Plan goal. The primary goal is to evaluate the Plan's success in arresting the downward trend in spotted owl populations and in maintaining and restoring the habitat necessary to support viable populations on federally administered forests throughout the owl's range.



The primary objectives are to:

- Assess changes in population trend and demographic performance of spotted owls on federally administered forests in the owl's range.
- Assess changes in the amount and distribution of nesting, roosting, foraging habitat, and dispersal habitat for spotted owls on federally administered forest lands.

The cornerstones of the spotted owl effectiveness monitoring strategy are population and habitat assessment. Integrating data from population and habitat monitoring is being explored through research to develop predictive models (that is, predicting owl population status from the state of the habitat).

## Highlights

Highlights from the northern spotted owl effectiveness monitoring activities include the following:

- Surveys of the eight demography study areas in 2001 recorded information on occupancy, survival, and reproduction from nearly 1100 spotted owl sites. Spotted owl pairs were present at 52.1% of these sites (Table 2).
- The percentage of female owls that nested across the eight areas ranged from 20 to 84.8 % and the number of young fledged per area ranged from 16 to 109. The total number of young fledged was 492, up 30% from the 2000 season.
- Work on developing a habitat map was begun for the western Cascades in Oregon under the predictive model-development program. The preliminary rule set for the CALVEG map data was developed for the owl habitat map in the California portion of the Klamath Province.
- The predictive model-development research project completed several data analyses in the Roseburg portion of the Oregon Coast Range and initiated Phase II of the project in the Western Cascades Province in Oregon. Two major tasks were to be completed from Phase I that were not done at the time of the Phase I progress report: variance components analyses for survival and productivity models, and estimating habitat fitness potential ( $\lambda_H$ ). Both of these analyses were finished for the Roseburg BLM study area in 2001.

- In 2001, survival and productivity were modeled for the H.J. Andrews study area by using an aerial photo-based map, the interagency vegetation mapping project (IVMP) map, and a satellite image map. The survival modeling is essentially complete, and variance-components analyses for the best-survival model will be the focus of work in 2002.

**Table 2. Summary of northern spotted owl occupancy and reproduction by demography area for 2001. This is preliminary data; values may change in the final analysis.**

Demographic area	Sites surveyed ( <i>number</i> )	Sites with a territorial pair ( <i>number</i> ) (%)	Females nesting (%)*	Young fledged ( <i>number</i> )
Olympic Peninsula	138	68 49.3	41.1	42
Cle Elum	71	23 32.4	73.9	26
H.J. Andrews	162	95 58.6	48.0	81
North Coast	204	94 46.1	84.8	109
Roseburg	131	72 54.9	81.2	85
South Cascades	153	77 50.3	20.0	16
Klamath	142	87 61.3	73.9	82
NW California	94	55 58.5	53.7	51
<b>TOTALS</b>	1095	571 52.1	—	492

\* Female Nesting %: based upon number of territorial females monitored for nesting activity.

### Looking Ahead

In 2002, additional steps will be taken towards completing the spotted owl chapter of the Northwest Forest Plan Monitoring Interpretive Report scheduled for release in 2004. Planning includes a workshop to analyze population data and steps to map and analyze the status and trend in maintaining and restoring owl habitat under the Plan.

### Contact Information:

For more information on the Northern Spotted Owl Module contact:

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Website: [www.reo.gov/monitoring/nso](http://www.reo.gov/monitoring/nso)

### Collecting northern spotted owl weight data.



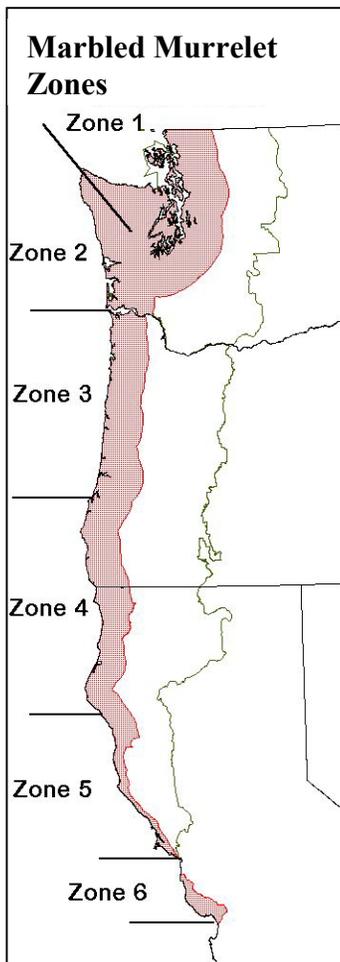
Janice Reid

# Marbled Murrelets

Survey data from 2001 represent only the second year of population monitoring data collected under the effectiveness monitoring program. The purpose of the marbled murrelet effectiveness monitoring plan is to assess trends in marbled murrelet (*Brachyramphus marmoratus*) populations and their nesting habitat throughout the Plan's range. This program has two components: population monitoring at sea, and monitoring of nesting habitat at inland forest sites.

The objectives of the population monitoring component are to estimate the size of the population residing in the coastal waters adjacent to the Plan area and assess trends in population size over time. Each objective provides results in each of five murrelet conservation zones and also across the range of the Plan (that is, across all five conservation zones in the Plan area).

The objectives of the Program's habitat monitoring are to establish a credible nesting-habitat baseline, as well as to assess status and trends of marbled murrelet nesting habitat in the Plan area. One type of predictive model being developed is the habitat relation model. The goal is to develop a single,



**Murrelet zones in WA, OR and CA are shown in red. Zones 1-5 are in the Northwest Forest Plan area.**

statistically derived Plan-wide predictive model of murrelet nesting habitat. Its specific objectives are to collect information on murrelet habitat characteristics from a random sample of occupied and unoccupied (or, in California, random) sites in each physiographic province; to derive and compile for each site vegetation and fragmentation data from remote imagery developed by the interagency vegetation mapping project (IVMP); and to build predictive statistical models of marbled murrelet habitat associations based on data sets developed in the first two objectives.

## Highlights

Highlights of the marbled murrelet effectiveness monitoring program include the following:

- Murrelet populations were surveyed were conducted from mid-May through late July in 2001 in all five of the murrelet conservation zones in the Plan area. The population of marbled murrelets that resides in that area was estimated to be 21,200, and the 95% confidence interval ranged from 16,000 to 26,400 (Table 3).
- The density of marbled murrelets was highest in zone 3 (the Oregon Coast north of Coos Bay), and the population of murrelets was highest in zone 1 (Puget Sound and the Strait of Juan de Fuca in Washington).
- The 2001 population estimate overlaps the population estimate from 2000 (18,100 murrelets, with a 95% confidence interval ranging from 13,000 – 23,200). Given the amount of variability in the estimates, there is no evidence of a change in population numbers from 2000 to 2001.
- As part of the habitat-monitoring program, vegetation and habitat data (such as canopy cover and number of crown layers) were collected from 51 sites and 428 plots during 2001. These sites were in 4 of the 12 provinces in the plan (Olympic, Oregon Coast, Klamath, and California Coast). A suite of individual tree measurements (e.g., DBH,

number of platforms, crown diameter) were also collected from ca. 10,500 trees across the four provinces.

**Table 3. Summary of marbled murrelet population statistics for the 2001 breeding season across conservation zones 1-5.**

Population parameter	Estimate
Area (km <sup>2</sup> )	8,811
Density (number of birds/km <sup>2</sup> )	2.4
Coefficient of variation of density (%)	12.5
Population estimate	21,200
95% confidence interval on population estimate	16,000 – 26,400

### Looking Ahead

Now is too soon to detect biologically meaningful changes in estimates of either density or population size. For example, power analyses conducted at the end of the 2000 survey season showed that at least 8 years may be needed to detect an annual decline in the population of 10% with a reasonable degree of statistical certainty.

No analyses of previously collected habitat data have been conducted because the data are not yet complete. Data must still be collected from 126 sites in five additional provinces during the 2002 field season.

Surveying populations and collecting nesting-habitat data will continue in 2002. No major changes in methods or sampling designs are scheduled. Annual reports are anticipated for the 2002 and 2003 field seasons. The full monitoring interpretive report is scheduled for completion in 2004; it will include analyses of both population and nesting habitat data.

### Contact Information

For more information on the marbled murrelet module contact:

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Paul Phifer (After Oct. 1, 2002) US Fish and Wildlife Service, Portland, OR, Phone: 503-872-2823, Email: [Paul\\_Phifer@r1.fws.gov](mailto:Paul_Phifer@r1.fws.gov)

Website: [www.reo.gov/monitoring/murrelet](http://www.reo.gov/monitoring/murrelet)

**Conducting marbled murrelet surveys.**



Martin Raphael

**Nesting marbled murrelet**



Tom Hammer

# Aquatic Riparian

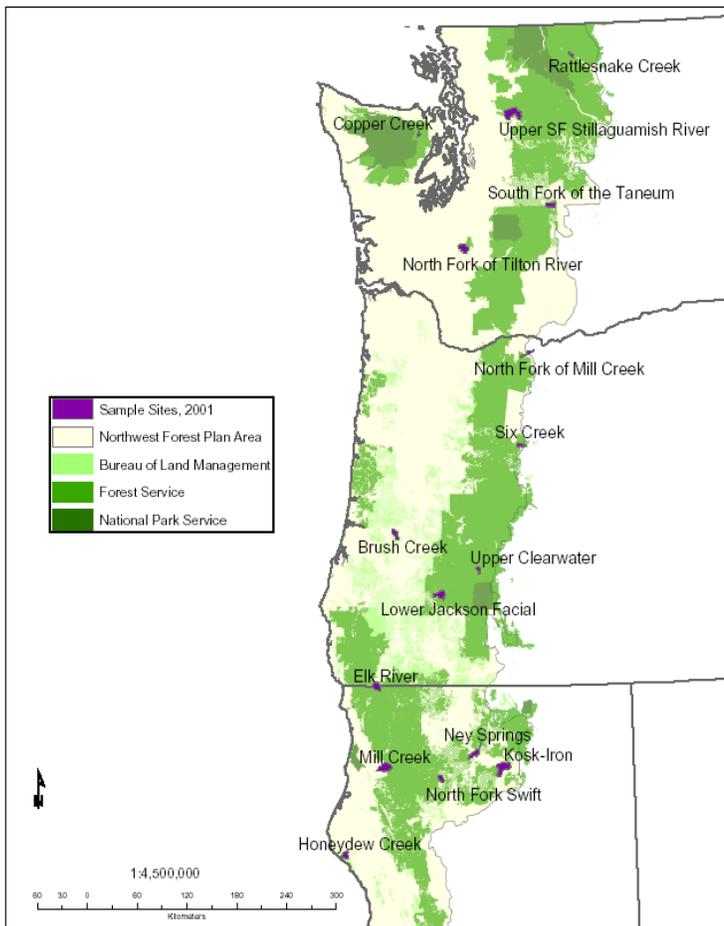
The purpose of Aquatic Riparian Effectiveness Monitoring Plan (AREMP) Module is to assess the ecological condition of watersheds by evaluating status and trends in watershed, stream and riparian conditions. Specific objectives are to assess aquatic, riparian, and upslope ecosystems; develop ecosystem 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.

A pilot project was conducted in 2001 in 16 watersheds to continue the refinement of the data collection protocols and to answer other questions related to implementing the monitoring plan. Questions were addressed about data collection and quality control and a draft decision support model to synthesize data was developed. Full implementation program costs were refined and meetings with state agency personnel to discuss how to coordinate monitoring efforts were begun.

## Highlights

Highlights of the 2001 pilot program:

- It was concluded that intensive surveys characterize watershed in-channel conditions similarly to extensive basin-wide surveys. For example, habitat indicators such as bankfull width-to-depth ratio, entrenchment ratio, wood frequency, and substrate were not significantly different in the two surveys. Large-pool frequency was marginally significantly higher in the intensive surveys than in the extensive survey. Intensive surveys were also found to have less variability, so they will be more sensitive to detecting changes in watershed condition. Intensive surveys are also more cost effective than extensive basinwide surveys because less sampling is required.
- A data quality assurance (QA) program was developed and implemented. It was concluded that the original and quality assurance surveys were not significantly different for any of the in-channel attributes examined.



**Location of the sixteen 6<sup>th</sup>-field watersheds sampled during 2001. Federal lands within the Northwest Forest Plan area appear as green shading.**

- Vegetation composition for riparian and upslope areas was determined by using data layers developed by the Interagency Vegetation Mapping Project for Oregon and Washington and CalVeg in California.
- The stream GIS layer was buffered 100 m on each side and overlaid with the roads layer to calculate road density (miles of road per square mile of watershed) for both upslope (>100 m from stream) and riparian areas (<100 m from stream). The number of road crossings was estimated by finding the intersection of roads and streams.
- A draft decision-support model was developed to evaluate reach and watershed-scale conditions.
- Monitoring-plan personnel began hosting monthly meetings in November 2001 with state agency representatives from Washington, Oregon, and California to explore how to develop a monitoring partnership.
- 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 \$5,700 for each sample site.

**A laser rangefinder was used to measure stream channel profile.**



### Looking Ahead

In 2002, experts in each of the Northwest Forest Plan's eight aquatic provinces will be asked to help develop evaluation criteria for each attribute used in the decision-support model. Scientists from an oversight team will peer-review the model structure. A peer-reviewed QA plan will also be developed.

### Contact Information

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**Aquatic and terrestrial salamander surveys were done at each sampling site.**



Steve Lanigan

# Social and Economic

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The purpose of the social and economic effectiveness monitoring module is to assess the status and trends of social and economic effects of federal forest management on local communities in the Pacific Northwest. Accordingly, the program should track indicators that describe social and economic changes at the local community scale, and identify credible links between federal forest management and such changes.

## Highlights

Highlights of social and economic effectiveness monitoring include the following:

- During 2001, our team focused on identifying and refining monitoring design options. In this effort, the team worked with researchers at the University of Washington, under a cooperative agreement administered by the US Geologic Survey.
- Overcoming incompatibilities between published data and agency information needs has been a constant consideration. Federal and state government agencies including the US Census, US Bureau of Labor Statistics, and state employment departments publish credible data tracking of numerous social and economic indicators. Issues of scale and timeliness, however, pose a challenge in using published data to obtain meaningful results. For example, much economic data is reported at the county scale. Rural residents may not consider county boundaries meaningful in describing their local communities, however.
- Costs and other issues associated with collecting primary data at the local community scale have been a second critical concern. During 2001, the team carefully considered a community-scale individual-survey approach, but rejected it as infeasible because of high cost and significant operational drawbacks.

## Looking Ahead

Developing the monitoring program has progressed in two parts. During 2001, Phase I was completed. The Phase I report reviews available information, and recommends developing a community-scale model and data-collection strategy. Work in 2002 will focus on clarifying monitoring objectives, completing and revising the monitoring framework, and finalizing data collection and analysis protocols. A final framework document outlining options for monitoring is expected in 2002.

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# Tribal Relations

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The Plan area has 76 American Indian tribal governments that federal agencies are required to consult with on a government-to-government basis. This consultation is to ensure that tribal rights and interests are considered in decisions. To evaluate agency performance and, ultimately, to improve government-to-government relations, a monitoring program has been designed.

The purpose of the tribal relations module is to determine the effectiveness of federal agency consultation with Indian tribes on a government-to-government basis and if tribes are able to access resources to exercise their treaty and other rights and interests.

## Highlights

A pilot study was designed and implemented to determine the most effective approach to monitoring. The study included feedback from tribal governments, the Interagency Advisory Committee, and tribal relations experts.

## Looking Ahead

The monitoring program is scheduled for implementing in 2002 through interviews using a standardized questionnaire. Its purpose is to obtain information from all tribes about the effectiveness of agency efforts.

A local federal line officer and agency tribal relations program staff will meet with tribal government leaders and staff to complete the interview. Most often, the federal representative is from the USDA Forest Service or USDI Bureau of Land Management. Interviews will be repeated at least every 3 years for each of the 76 tribes in western Washington and Oregon and northwest California.

The results of the interviews will be used to describe long-term regional patterns in tribal relations and to provide immediate feedback for improving them. Opportunities for partnerships and improved relations are ultimately expected; these improvements may then lead to improvements in management decisions.

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## Tribal elder describes traditional medicine and spiritual plants still used by tribal members in today's modern world.



# Monitoring Spotlight

## Barred Owls

Barred owls (*Strix varia*) and their relation to northern spotted owl site occupancy and productivity received continued attention in the monitoring program. These data are gathered along with the spotted owl surveys, so the costs for data gathering is minimal and may be important to explaining spotted owl occupancy, or the lack thereof, in otherwise suitable habitat.

Several of the study areas reported “increasing numbers of barred owls” and barred owl occupancy of sites previously occupied by spotted owls. In the Olympic National Park portion of the Olympic Peninsula Demography Study Area, barred owls were recorded at 23 sites in 2001. Eight of these detections were pairs. Barred owl reproduction was confirmed at two sites. No hybridization with spotted owls was documented in 2001 in the Park. Farther south in the range, in the Klamath and Tye (Roseburg) demography-study areas, more than 50 non-juvenile barred owls were detected in 2001. Reproduction in barred owl pairs was documented, as was hybridization of a male spotted owl with a female barred owl. The graph showing numbers of barred owls detected over time in the Tye density study area is indicative of the trend seen in other study areas (Figure 1).

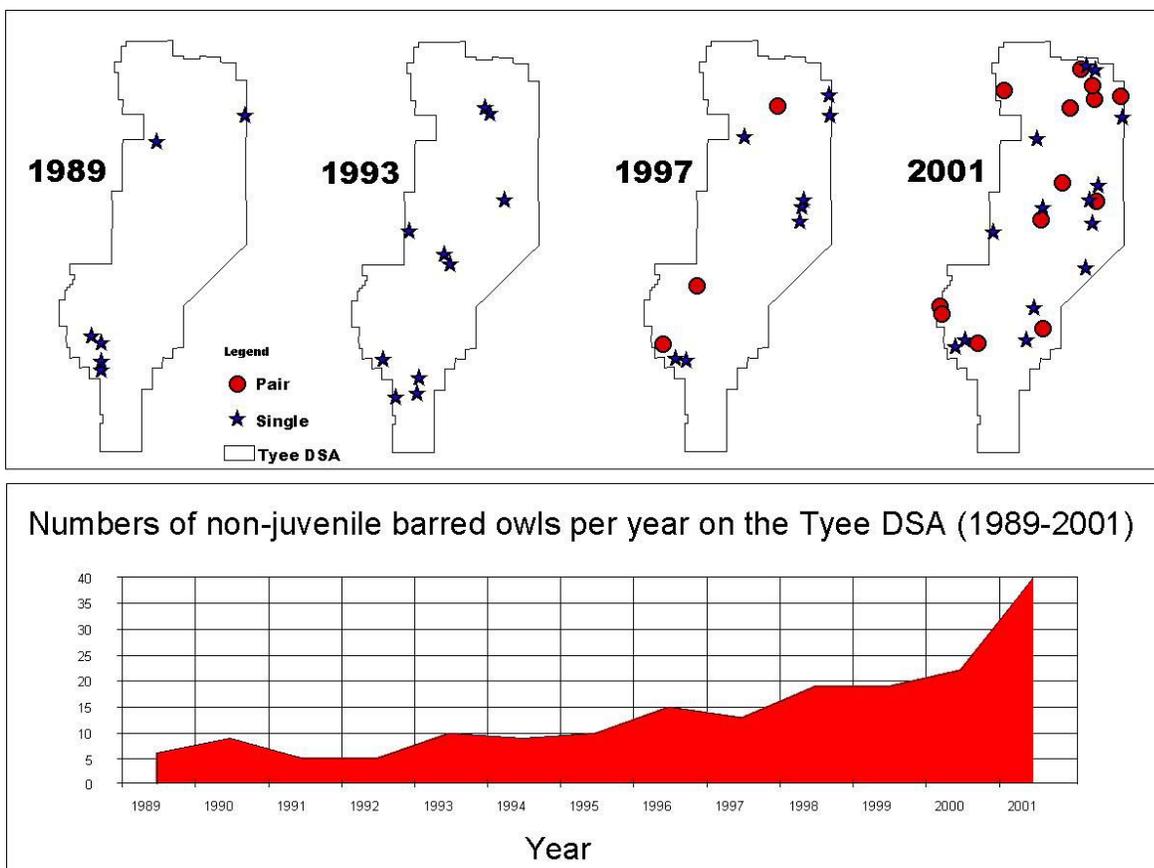
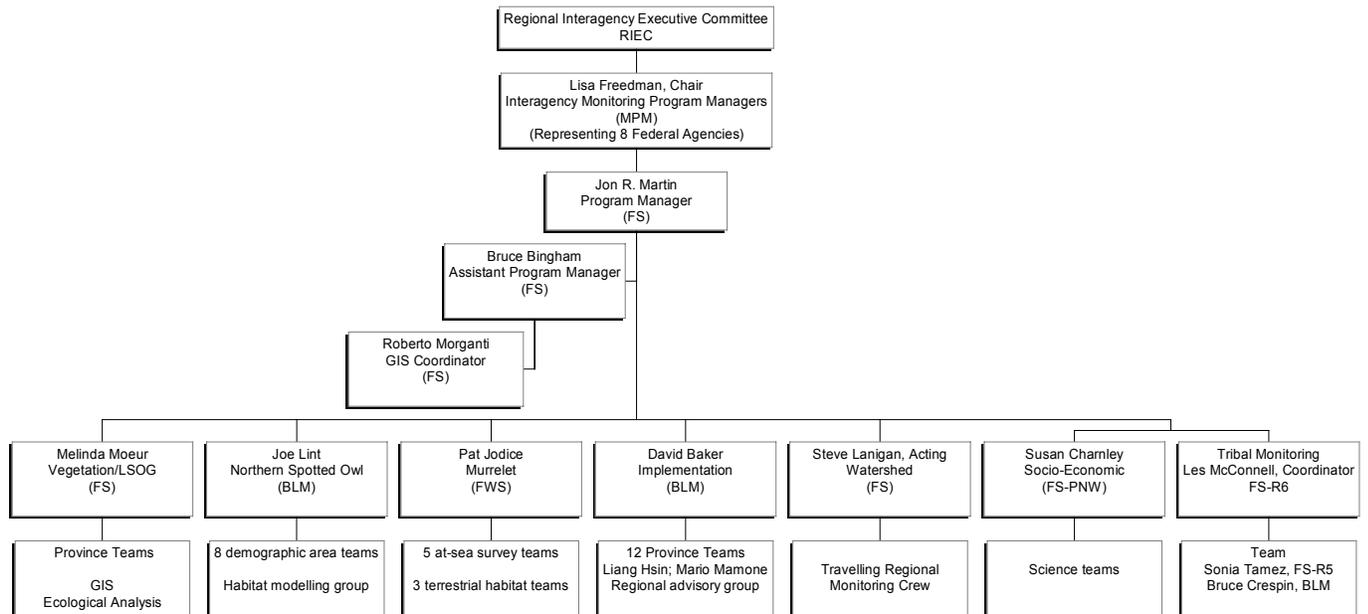


Figure 1. Barred owl detections in the Tye demographic study area, Roseburg, Oregon 1989-2001.

# Interagency Regional Monitoring Program Team

## June 2002



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## Agency Abbreviations

BLM	USDI Bureau of Land Management
CDFG	California Department of Fish and Game
EPA	US Environmental Protection Agency
NMFS	National Marine Fisheries Service
NPS	USDI National Park Service
NWIFC	Northwest Indian Fisheries Commission
ODFWS	Oregon Department of Fish and Wildlife
PNW	Pacific Northwest Research Station, United States Forest Service
PSW	Pacific Southwest Research Station, United States Forest Service
USFS	United States Forest Service
USFS-R5	United States Forest Service Region 5
USFS-R6	United States Forest Service Region 6
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USGS-BRD	United States Geological Survey- Biological Resources Division
WDFW	Washington Department of Fish and Game
WDNR	Washington Department of Natural Resources

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**Forest Service**

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R6-NWFP-TP-08-02  
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