

Northern Spotted Owl Effectiveness Monitoring Plan Under the  
Northwest Forest Plan

Annual Summary Report  
2000

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# Northern Spotted Owl Effectiveness Monitoring Plan 2000 Summary

## Background

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 success of the Northwest Forest Plan (the Plan) in arresting the downward trend in spotted owl populations and in maintaining and restoring the habitat conditions necessary to support viable populations of the northern spotted owl on federally-administered forest lands throughout the owl's range.

The primary objectives of the monitoring plan for these lands are to:

Assess changes in population trend and demographic performance of spotted owls on federally administered forest lands within the owl's range.

Assess changes in the amount and distribution of nesting, roosting, foraging (NRF) 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). This report summarizes the activities in fiscal year (FY) 2000 monitoring owl populations, assessing owl habitat and developing predictive models.

## Population Monitoring

The population monitoring lead is Eric Forsman, USDA Forest Service, Pacific Northwest Research Station, Olympia, Washington.

Under the plan, the owl population is monitored by surveying of spotted owls in eight demographic study areas to determine the occupancy, survival, and reproductive success of the marked owls inhabiting them.

### *Demographic Study Areas and Principal Investigators*

**Olympic Peninsula.** Eric Forsman, USDA Forest Service, Pacific Northwest Research Station and Patti Happe, National Park Service

**Cle Elum.** Eric Forsman, USDA Forest Service, Pacific Northwest Research Station

**H.J Andrews Experimental Forest.** Robert Anthony, U.S. Geological Survey

**North Coast.** Eric Forsman, USDA Forest Service, Pacific Northwest Research Station

**Roseburg.** Eric Forsman, USDA Forest Service, Pacific Northwest Research Station

**South Cascades.** Robert Anthony, U.S. Geological Survey

**Klamath.** Joseph Lint, Oregon State Office, BLM, Eric Forsman, USDA Forest Service, Pacific Northwest Research Station

**Northwestern California.** Rocky Gutierrez, University of Minnesota, and Alan Franklin, Colorado State University

### *Occupancy*

Owls were surveyed between March and August of 2000 in each of the eight demographic areas. A total of 1,086 sites were surveyed; 513 (47.2%) of the sites were found to be occupied by territorial pairs of spotted owls and an additional 79 (7.3%) sites had resident single owls present. Pair occupancy values ranged from a high of 58.4% of the sites in the H.J. Andrews Experimental Forest study area to 41 to 43% in the Cle Elum, Klamath, North Coast, and South Cascades study areas. These values are similar to data from previous years (Table 1).

**Table 1. Summary of spotted owl occupancy by demography area for 2000<sup>a</sup>**

Demographic area	Sites surveyed (number)	Sites with a territorial pair		Sites with a resident single owl	
		(number)	(%)	(number)	(%)
Olympic Peninsula	132	61	46.2	23	17.4
Cle Elum	72	30	41.7	4	5.6
H.J. Andrews	161	94	58.4	8	5.0
North Coast	235	98	41.7	37	15.7
Roseburg	127	64	50.4	14	11.0
South Cascades	129	56	43.4	10	7.8
Klamath	136	56	41.2	14	10.3
Northwestern California	94	54	57.4	6	6.4
TOTALS	1086	513	47.2	79	7.3

<sup>a</sup>Preliminary data; values may change in the final analysis.

### *Reproduction*

Survey efforts in March through May of 2000 focused on determining the owls' nesting status. In June through July, those sites identified as "nesting" were revisited to obtain information on the number of young fledged. Nesting varied across the eight demographic areas: South Cascades was 82%, Cle Elum was 78.6%, and Klamath was 73.6% for the percentage of nesting females; the Olympic Peninsula study area showed a value of only 40%.

Values for fecundity ranged from a high of 0.758 in the South Cascades study area to lows of 0.255 in the North Coast study area and 0.049 in the Olympic Peninsula study. It was a poor year for reproduction on the Olympic Peninsula with only seven young fledged (Table 2).

**Table 2. Summary of Spotted Owl Reproduction by Demography Area for 2000<sup>a</sup>**

<b>Demographic area</b>	<b>Females Nesting (%)</b>	<b>Young Fledged (number)</b>	<b>Fecundity<sup>b</sup></b>
Olympic Peninsula	40.6	7	0.049
Cle Elum	78.6	32	0.516
H.J. Andrews	61.0	59	0.390
North Coast	53.5	51	0.255
Roseburg	51.6	35	0.278
South Cascades	82.0	58	0.758
Klamath	73.6	62	0.554
Northwestern California	61.0	40	0.345
<b>TOTALS</b>	*	344	0.335

<sup>a</sup>Preliminary data; values may change in the final analysis.

<sup>b</sup>Number of female young fledged per territorial female (assumed 1:1 sex ratio of young).

### *Owl banding and reobservation*

Individual owls without bands in each of the study areas were captured and banded with USGS aluminum, numbered leg bands and colored leg bands. Previously banded owls were identified by recapture and recording the number on the leg band or frequently by the reobservation of the colored leg band while the owl was in flight or feeding on prey near the observer. The data collected from banded owls are used in subsequent analysis to determine survival rates, turnover rates, and geographic movements of owls. In 2000, 1,351 adult/subadults and juvenile northern spotted owls were either initially banded or reobserved. Of the 344 juveniles produced, 314 (91%) were banded and released for future reobservation (Table 3).

**Table 3. Summary of spotted owl banding and reobservation by Demographic area for 2000<sup>a</sup>**

Demographic Area	Adults/subadults banded or reobserved ( <i>no.</i> )	Juveniles banded ( <i>no.</i> )
Olympic Peninsula	129	6
Cle Elum	64	29
H.J. Andrews	149	54
North Coast	223	51
Roseburg	144	34
South Cascades	81	43
Klamath	141	58
Northwestern California	106	39
Totals	1037	314

<sup>a</sup>Preliminary data; values may change in the final analysis.

### **Habitat Map Development**

The habitat assessment lead is Martin Raphael, USDA Forest Service, Pacific Northwest Research Station, Olympia, Washington.

In 2000, habitat map-related work was done as a part of the effort to build a predictive model. The work was focused on the Coast Range Province of Oregon because it was the only one where there was an Interagency Vegetation Map Project (IVMP) product available (interagency vegetation map).

The predictive model group examined three different maps for estimating habitat condition. These were the digital vegetation maps for the Oregon Coast Range from the interagency vegetation map, the Coastal Landscape and Modeling Study (CLAMS) map and existing vegetation maps developed from aerial photo interpretation(photo-based maps). The comparison of these three maps indicated that the interagency vegetation map did not produce results, in general, as good as those from aerial photo interpretation or the CLAMS map. A few specific models were best for the interagency vegetation map. Mapping broadleaf forests, in contrast to mapping early age clearcuts, was a problem with the interagency vegetation map that affected the results of the models. Additional detail on the habitat work is in the predictive-model development mentioned in the next section.

Work in FY 2001 will focus on developing habitat maps in the Oregon Cascades Province under the predictive model study. Preliminary information indicate that the interagency vegetation map for this area may not have the classification problems encountered in the Coast Range map and thus provide a better opportunity to develop a more accurate algorithm for identifying spotted owl habitat than the Coast Range Map.

Formulating a strategy and time line for developing a habitat map across the range of the owl will be part of the discussion in the progress review of the whole spotted owl monitoring program in FY 2001/2002.

### **Predictive Model Development**

The lead for predictive model development is Robert Anthony, U.S. Geological Survey, Corvallis, Oregon.

The predictive model development element of the monitoring plan is a research effort designed to determine if landscape composition and patterns can be used to predict abundance and demographic performance of northern spotted owls. If landscape composition and pattern are shown to be reliable predictors of owl abundance and demographic performance, then monitoring spotted owl populations may shift, in some areas, to a habitat-based strategy.

The specific objectives of the project included summarizing the abundance and demographic performance of spotted owls at the home range and landscape scales, characterizing landscape composition and patterns for home ranges and landscapes, developing statistical models relating abundance and demographic performance of owls to landscape characteristics for a subset of home ranges in the demographic study areas, validating the statistical models by testing them on the remaining home ranges, and using the statistical models to develop or refine existing spatially explicit models for spotted owls.

The predictive model development project recently provided an interim report to the Effectiveness Monitoring Group on the progress of the project to date. The report, issued in December, 2000 is entitled *Predicting abundance and demographic performance of northern spotted owls from vegetative characteristics. Report on Phase I: Evaluation of different methods for habitat mapping*. A copy of this report is available from Joe Lint, Bureau of Land Management, 777 Garden Valley Blvd., Roseburg, OR 97470.

The interim report describes the results of the research project's first phase, summarizes the results of a workshop held in 1999, revises objectives and approaches of the original proposal for the research, and provides recommendations for the second phase of the project.

The purpose of the first phase was to describe the relations between landscape characteristics and the demographic performance of spotted owls from at least two different habitat-mapping methods for at least two different study areas. Three map products were available for three study areas in western Oregon, including maps for each study area developed from aerial photos and two maps developed from satellite imagery: the interagency vegetation map and the CLAMS map.

### Summary of Findings

Maps from the Interagency Vegetation Mapping Project produced results generally not as good as those from aerial photo interpretation or the CLAMS map. A few specific models were best for the interagency vegetation map, however mapping broadleaf forests (in contrast to early age clearcuts) was and still is a problem with the interagency vegetation map that affected model results.

The results for aerial interpretation for the Roseburg area were particularly interesting in that they showed a positive relation between the amount of non-habitat edge and productivity. These results compared favorably with the results of earlier work by Alan Franklin in northern California that found a similar relation.

Results, indicated that for useful results, the demographic sample sizes must be a minimum of 75 to 100 owl territories. This number eliminates some demographic study areas from model building and modifies the testing and validating procedures for other areas. Opportunities to supplement the data sets with data from nonfederal studies are being explored so that building models including all the demographic areas can be tested. It would bolster the testing and validation of model results for those areas.

Developing the models will focus on the Oregon Cascades in 2001-02 along with work in the Olympic Peninsula. Continued work in the Oregon Coast Range is dependent upon improvements to the interagency vegetation map. A target date of September, 2002 has been set to have models for these areas developed, although the feasibility of this time frame may depend on the outcome of the Oregon Cascades efforts.

## **Management Considerations**

No province or range-wide analyses were scheduled or conducted in FY 2000 for any of the spotted owl monitoring program elements. Information gathered in FY 2000 will be further analyzed in the next metapopulation analysis scheduled for 2003, and the monitoring interpretive report is scheduled for completion in 2004.

The monitoring program managers' decided to pilot test transfer of field data collection for the Forest Service portion of the Olympic Peninsula demographic study area from the Pacific Northwest Research Station to the Olympic National Forest during the 2001 field season. In the first phase of this transfer, the Olympic Forest will have responsibility for hiring and equipping the field crews and the Research Station will provide leadership to oversee collecting, summarizing and analyzing the data . The transfer will be evaluated and used to guide future work on the Olympic Forest and decisions to transfer monitoring responsibilities for other demographic study areas from the Research Station to the national forests.

## Budget Information

**Table 4. Spotted owl effectiveness monitoring funding by monitoring element and contributing agency in fiscal year 2000**

Element name	<i>Funding Agency Contribution (thousands of dollars)</i>								<b>Funding total by element or task</b>
	<i>USFS</i>		<i>BRD</i>		<i>BLM</i>	<i>NPS</i>	<i>FWS</i>		
	<b>Region 5</b>	<b>Region 6</b>	<b>PNW</b>	<b>PSW</b>					
Demographic areas	432.0	775.0	--	--	--	570.0	140.0	--	1917.0
Habitat map	--	*	--	100.0	--	*	--	--	100.0
Predictive models	--	--	110.0	--	100.0	--	--	--	210.0
Coordination and management	--	--	--	--	--	60.0	--	--	60.0
<b>Funding subtotal</b>	432.0	775.0	110.0	100.0	100.0	630.0	140.0	0.0	
<b>Funding total by agency</b>		1417.0			100.0	630.0	140.0	0.0	2287.0

\* For FY 2000 the predictive model group will take lead on habitat map work in OR and WA, thus, the habitat map group will not need the \$100 K originally requested for this work

**Table 5. Spotted owl effectiveness monitoring funding by monitoring element and contributing agency in fiscal year 2001**

Element name	<i>Funding Agency Contribution (thousands of dollars)</i>								<b>Funding total By element or task</b>
	<b>Region 5</b>	<i>USFS</i> <b>Region 6</b>	<b>PNW</b>	<b>PSW</b>	<i>BRD</i>	<i>BLM</i>	<i>NPS</i>	<i>FWS</i>	
Demographic Areas	415.0	943.4	--	--	--	600.0	140.0	--	2098.4
Habitat map	--	*	--	--	--	*	--	--	0.0
Predictive models	--	--	138.6	--	100.0	--	--	--	238.6
Coordination and management	--	--	--	--	--	60.0	--	--	60.0
<b>Funding subtotal</b>	415.0	943.4	138.6	0.0	100.0	660.0	140.0	--	
<b>Funding total by agency</b>		1497.0			100.0	660.0	140.0	0.0	2397.0

\*Habitat map work is being done within the framework of the predictive model element.