

**Title: Northern Spotted Owls****Parks:** OLYM, MORA, NOCA**Justification:**

In 1990 the U.S. Fish and Wildlife Service listed the northern spotted owl (NSO) as threatened throughout its range. The reason for the species' decline, and subsequent protection, was the loss of old forests that spotted owls require. In the absence of a recovery plan (a draft was released but never a final), the federal contribution towards the conservation of the owls are being met via implementing the Northwest Forest Plan. The NPS is one of the signatories on that plan.

Logging altered the habitat of the owl through out Washington state. While spotted owls still remain in the 3 large parks in the NCCN network (MORA, NOCA, OLYM) logging has encircled much of the boundaries of the parks. Old-growth forests outside the parks are fragmented, discontinuous, and widely dispersed. However, inside the parks, habitat is largely unfragmented and continuous.

Although each park contains NSO, the situation in each park is slightly different. Olympic NP contains the largest block of pristine habitat remaining in the range of the northern spotted owl (776,000 acres). Following an inventory completed in 1995, we estimated that there were 230 pairs (+- 71 90%CI), or 705 individuals in OLYM. MORA contains more than 82,000 acres of NSO habitat, and an unknown number of pairs. NOCA has 200,000 acres of potential northern spotted owl habitat, and an estimated 25 pairs.

The history of NSO monitoring in the 3 parks has consequently been different. OLYM, along with Olympic National Forest, comprise the Olympic Province Demographic study area as part of the effectiveness monitoring required by the NW Forest plan. It is one of 8 Forest Plan study areas, and the only NPS unit included, and required, by that plan. Demographic monitoring began in the park in 1987, and we currently monitor pairs at 52 sites throughout the Park.

MORA conducted an NSO inventory in 1997-1998 but never developed parkwide or density estimates. MORA comprises approximately one half of the Rainier Demographic Study Area (DSA) with contributions of park data beginning in 1998. The Rainier Demographic Study area, one of 14 total study areas within the range of the Northern spotted owl, is the only DSA within the Washington Western Cascades Ecological Province. MORA continues to monitor 26 northern spotted owl sites in the park and combines these data with a nearly matching number of pairs outside the park in private and USFS lands to analyze DSA data.

NOCA initiated its spotted owl program with a park-wide inventory from 1993 through 1996. Eleven spotted owl activity sites were identified. Pair occupancy was documented at 6 sites. Three pair occupancy sites in the LACH have been monitored annually

through 2002 as part of larger east-slope Cascades monitoring program conducted by NACSI

This past January, researchers conducted a meta analysis of NSO demographic data to evaluate the status of the owl. In that effort, data was compiled from the 8 Forest Plan DSAs and an additional 6 studies conducted by a combination of government, private and tribal researchers. Data from Rainier contributed significantly to one study area, aptly named Rainier. In addition, data from 3 sites in NOCA were compiled in the Wenatchee study.

Results indicate that NSO are declining at an alarming rate in the state of WA, worse than in any other state. Overall the decline is 7.5% per year; it is estimated that only 50-70% of the original population remains on the study areas. We suspect that this is driven by several factors 1) high density of barred owls (they invaded WA first and are expanding southward), 2) loss of habitat due to continued logging on state and private lands, and 3) large scale wildfires. Populations on the Olympic Peninsula, where logging and fire are not a factor and maybe the last area in the state for barred owl invasion, had the lowest rate of decline (4.8%).

Due to the 1) ongoing nature of NSO monitoring in 2/3 parks in the network, 2) the ability for our data to be integrated in larger regional and interagency efforts, 3) the critical state that the species is in, 4) the profound impact that NSO management has had on society in the Northwest, and 5) the key role lands in the parks play as pristine benchmarks, we feel that continuing NSO monitoring in the NCCN is a high priority. It is one of the conclusions of the meta-analysis that due to the perilous nature of the owl, all DSA's be continued.

### **Monitoring Objectives:**

1. Estimate abundance of NSO, and monitor annual changes in abundance.
2. Determine population trend (without actual estimates of abundance).
3. Determine mechanisms of population trend. What is the trend in survival, fecundity at known territories?
4. Determine changes in distribution of breeding NSO. What is the probability of occupancy of historically known NSO territories in suitable habitat?

**For Objectives 1& 2 the monitoring plans are fairly similar: Are NSO populations increasing, decreasing, or stable?**

*What will be monitored?*

Territorial spotted owls during the breeding season

*Target population?*

Territorial NSO in suitable habitats throughout the parks (in OLYM older seral coniferous forests <3000feet southwest/wet side of the park, <4000feet drier/northeast side)

*What will be measured?*

1. Number of responding owls within sample plots.
2. Presence/absence or frequency of response.

*How is it measured?*

1. Using inventory methods as described in park unpublished reports (hoot responses from points along routes approx 400m apart during the day (with a few night surveys in some locations)). Repeat visits within season needed to estimate detection probability.
2. Elicit responses from territorial NSO from stations along transects. Metric is proportion of transects with responses.

*Where is it monitored?*

1. We will search for, and try to elicit responses from territorial owls in sample units that are distributed in a probabilistic manner in safely accessible sample units in NSO habitat.
2. We will call for NSO and try to detect their presence along a probabilistic sample of safely accessible transects.

*How frequently will it be monitored?*

For both methods, we will design a rotating panel sampling frame with annual revisits to one panel, and at least 5 year rotation of remaining panel. Sample sizes and design details will be worked out in an upcoming program review. One real serious consideration is that NSO in Washington, especially in OLYM, show strong biannual patterns of alternating high and low reproduction, and consequent territory occupancy and detectability.

Earlier efforts directed by the BLM and USFS devised a similar plot-based sampling scheme that, based on established detection probabilities for NSO, determined that one would need to sample in 56 blocks per year per area of inference to detect 5% annual decline with 80% power after 10 years of sampling. Due to smaller populations sizes and habitat available, sample sizes will be less in MORA and NOCA, but will likely be 56 in OLYM.

Objectives 3&4: Monitor populations trend and determine mechanisms of population change (trend in survival, distribution, occupancy, and fecundity at known territories)

*What will be monitored?*

Building on existing datasets, and long standing and widely employed methodologies, we will monitor territorial spotted owls in known territories during the breeding season.

*Target population?*

Historically known territories in OLYM, MORA, NOCA

*What will be measured?*

For Objective #3, we will monitor occupancy, survival and fecundity at selected owl territories. For Objective # 4 we will only monitor occupancy.

*How is it measured?*

For Objective #3, we would use USFS protocols for demographic monitoring (min 3 visits annually or until all demographic info is collected). Tag all birds to track apparent survival. Record fecundity at reproductive sites, and tag all juveniles to track apparent juvenile survival and dispersal. This requires up to 6 visits to a site annually.

For Objective #4 we would still use the USFS protocols for demographic monitoring, but would not need to tag individuals (because not getting survival) of determine reproductive output. The maximum number of visits required to a site would be 3.

*Where is it monitored?*

Subjective sample of historically known territories.

*How frequently will it be monitored?*

For Objective #3, annually (survival could be done at less frequent intervals but nobody ever analyses multi-year survival). For Objective #4, annually, but this could be done at less frequent intervals with unknown effects on power.

**Protocol development schedule, interim products, and budget:**

A formal program review will be held at OLYM in the fall of 2004. The entire spotted owl monitoring program, across the Northwest Forest Plan area, is currently in flux. The program review will determine the direction of NCCN spotted owl protocol development and implementation.

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