

Protocol: Landbird Population Monitoring

Parks Where Protocol will be Implemented: FOCL, MORA, NOCA, OLYM, and SAJH. FOVA and EBLA are not included in this monitoring proposal. FOVA's size, at 209 acres, is too small to provide an adequate sample size to detect trends in density or frequency of occurrence using the proposed monitoring method. EBLA, while larger at over 17,000 acres, has only 209 acres in NPS ownership. Major resources identified in EBLA questions include raptors and shorebirds, which are not adequately surveyed using techniques proposed in this monitoring program.

Justification / Issues being Addressed: All seven parks in the NCCN identified landbird populations as a priority vital sign for long-term monitoring. A fairly large number of international treaties, domestic laws, and initiatives have been enacted that provide protection for migratory birds and require action by NPS (e.g. Migratory Bird Treaty Act, Endangered Species Act, North American Bird Conservation Initiative). Despite these protections, landbird populations continue to decline. Approximately 30 species, representing both resident and migrant landbirds in the Pacific Northwest, have significant recent (1980-1996) and/or long-term (1966-1996) declining trends. NCCN parks represent some of the last remaining pristine habitat in the Pacific Northwest and represent excellent reference sites for more heavily managed lands.

Landbirds are an important ecosystem component (e.g. seed dispersal, insect control) and are good indicators of the effects of local and regional changes in ecosystems. They are easily detected and a wealth of information exists on their ecology. Well-developed standard methodologies provide potential to coordinate with other agency monitoring programs at regional, national, and global scales. Monitoring birds provides a cost effective method of assessing a broad-based element of ecosystem integrity. Birds hold high public interest and are a visible component of park ecosystems.

Monitoring Objectives: Determine trends in density and frequency of occurrence of landbird species in accessible areas of NCCN parks during the breeding season.

- Make park-level inference on trends in density and frequency of occurrence of widely distributed species in the Pacific Northwest to describe NCCN patterns, variation and differences between parks. *Justification: Unique habitats, bird species and issues exist among the parks. Trends may differ between parks and understanding those differences may help evaluate cause of changes.*
- Make NCCN-level inference in density and frequency of occurrence for subalpine, riparian and other habitat-specialist species. *Justification: These bird species because of their limited distribution are hard to monitor in a single park. Partners In Flight conservation strategies for monitoring high-elevation species in Washington and Oregon have identified NPS as having a key monitoring role, as identified in Altman and Bart (2001).*

What will be monitored? Landbirds (passerines, near-passerines and galliformes) will be monitored during the breeding season. Sampling methods will be sufficient to make park-level inferences of trends in density for at least 20 species, network-level inferences for several

additional species, and trends in frequency of detection for an additional 60 or so species comprising a broad spectrum of life histories and taxonomic groups.

Target population? Accessible regions within NOCA, OLYM, and MORA and parkwide at the small parks. “Accessible regions” is defined as one kilometer buffer strips on each side of park roads and trails. *Justification:* Travel costs, sampling requirements, and safety preclude probabilistic sampling at a parkwide scale. However, even when constraining our sampling to accessible areas only, in OLYM, this target population includes 30-85% parkwide coverage of the primary vegetation cover types.

What will be measured? Species frequency of occurrence (percent of VCP points where a species was detected) and density (individuals per hectare, by species) during the breeding season. Vegetation will be described at each VCP point using a rapid assessment that incorporates vegetation association, dominance classes by species, and cover type.

Basic Approach:

How will it be measured? Variable circular plot (VCP) point counts placed along transects in large parks and systematic grids in small parks.

Where is it measured? In the large parks, serially alternating panels of off-trail transects balanced geographically by elevation and east-west gradient. The sample will be selected using the Generalized Random-Tessellation Stratified (GRTS) sampling method with reverse hierarchical ordering to select 24 starting points in each elevation stratum in each park. GRTS sampling methods are increasingly being adopted for large-scale environmental monitoring programs because they create a spatially balanced sampling design that allows additional samples to be added or subtracted without compromising the spatial balance. Point count transects will be off-trail perpendicular to trails or roads. In the small parks, a parkwide systematic grid design will be used.

How frequently will it be measured? At the large parks, an augmented, serially alternating panel design will be used. At NOCA and OLYM, one panel of 12 transects will be measured annually. Five panels of 12 transects each will be measured one year over a five-year rotation. At MORA, the same panel design will be used, except each panel will consist of only 10 transects. At the small parks, parkwide systematic grids will be monitored every second year

Principal Investigators and NPS Lead: Protocol development will be completed through a cooperative agreement between The Institute for Bird Populations (IBP) and U.S.Department of the Interior, Geological Survey, Forest and Rangeland Ecosystem Science Center (USGS). Principal investigators include:

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Development Schedule, Budget, and Expected Interim Products:

Schedule: In 2004, NCCN parks with collaboration from USGS and IBP began a 3-year effort to write a protocol with standard operating procedures (SOPs) for landbird monitoring.

April 2005 - Draft field SOPs completed.

March 2006 - Draft data and reporting SOPs completed.

April 2006 - Submit to peer review.

September 2006 - Final peer-reviewed monitoring protocols completed.

May 2007 - Implementation of NCCN landbird monitoring program begins.