

**FEDERAL AID  
INTERIM PERFORMANCE REPORT**

ALASKA DEPARTMENT OF FISH AND GAME  
DIVISION OF WILDLIFE CONSERVATION  
PO Box 115526  
Juneau, AK 99811-5526

**Alaska Department of Fish and Game  
State Wildlife Grant**

**Grant Number:** T-1 **Segment Number:** 3  
**Project Number:** 5.11  
**Project Title:** Ecology of boreal owls (*Aegolius funereus*) in Interior Alaska  
**Project Duration:** July 1, 2006 – June 30, 2008  
**Report Period:** 1 July 2006 – 30 June 2007  
**Report Due Date:** September 30, 2007  
**Partner:** Alaska Department of Fish and Game

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**Project Objectives**

OBJECTIVE 1: Establish protocol and conduct spring listening surveys for boreal owls, great horned owls, and great gray owls in Interior Alaska.

JOB/ACTIVITY A: Conduct spring listening surveys. Based on the western Canadian protocol, we established 8 nocturnal listening routes. During mid-February through April of each year, routes are systematically completed under a variety of environmental conditions. At least 500 point-counts are completed each spring. Frequency and precise location of each singing owl are carefully recorded on field forms.

OBJECTIVE 2: Establish nest boxes along accessible transects to evaluate feasibility of spring listening surveys for determining owl nesting abundance.

JOB/ACTIVITY A: Establish nest boxes along transects. Over 100 nest boxes appropriate for boreal owl use have been established along boreal owl nocturnal singing routes. Maintenance of boxes is ongoing. We will attempt to correlate singing route data with subsequent breeding activity (proportion of use of nest boxes).

JOB/ACTIVITY B.: Collect nest box data on reproductive success/productivity. All nest boxes will be visited at least twice each spring (late April-early May) to assess proportion of use. Active nest boxes will be visited weekly throughout the brood-rearing season in an effort to record timing of egg-laying and subsequent hatching dates. Number of eggs produced, hatching success, and fledging success will be evaluated at each successful box.

JOB/ACTIVITY C: Banding. All attending adult female owls will be captured, weighed, and banded each spring. Fledgling young will also be captured and banded within one week of departing nests. Data on longevity, site attentiveness, and first breeding (maturity) will be gathered through subsequent captures of banded birds.

**OBJECTIVE 3:** Assess annual productivity of nesting boreal owls throughout an array of habitat types.

**JOB/ACTIVITY A:** Assess annual productivity of boreal owls using nest boxes. Compare and contrast productivity data between years and among various habitat types. Attempt to assess differences in productivity between areas modified by wildfire or by anthropogenic alterations.

**JOB/ACTIVITY B:** Collect data on prey diversity and abundance. Prey remains will be recorded at each nest visit. Following nesting, prey detritus “bricks” will be collected and analyzed for prey content and numbers. Annual indices of small mammal distribution and abundance indices will be gathered through establishment of snap-trap lines in various habitats. Correlations between prey enumerated from nests and those captured during small mammal trapping will be completed. The relationship between prey indices and annual boreal owl productivity will be investigated.

**JOB/ACTIVITY C:** Collect data on habitat types and correlate prey abundance and productivity of owls to habitats. Each nest box will be evaluated by conducting a 1/100<sup>th</sup>-acre timber stand exam. Productivity will be evaluated based on site characteristics (slope, aspect, elevation, forest type, forest age, understory characters, habitat alterations such as logging, wildfire history, etc.).

**OBJECTIVE 4:** Data analysis, writing of reports and articles, travel, presentation of papers.

**JOB/ACTIVITY A:** Analyze data and prepare reports.

**JOB/ACTIVITY B:** Share findings with working groups and agency managers, present at professional meetings and conferences, publish reports including peer-reviewed journals as appropriate.

## **Summary of Project Accomplishments**

**OBJECTIVE 1:**

**JOB/ACTIVITY A:** During February-April 2007, 8 owl survey routes were completed by biologists and volunteers. A total of 210 point counts were amassed, with 39 great horned owls (*Bubo virginianus*), 55 boreal owls (*Aegolius funereus*), 2 great gray owls (*Strix nebulosa*), and 2 northern hawk owls (*Surnia ulula*) detected. Unseasonably cold nights and uncharacteristic winds severely curtailed or hampered survey efforts.

**OBJECTIVE 2:**

**JOB/ACTIVITY A:** One hundred nineteen nest boxes were available for use during spring 2007. Of those, 38 were occupied by boreal owls (32% occupancy rate). Correlation analyses of singing rates and box occupancy rates are in progress.

**JOB/ACTIVITY B:** Over 350 nest box visits occurred during spring 2007. Thirty-eight occupied nest boxes produced 200 eggs (mean of 5.26 eggs/clutch). Hatching rates were high, with a mean of 4.9 hatchlings/clutch, with number of owlets surviving to fledging at 3.7 (or 4.2 fledglings per successful brood). These statistics are

significantly higher than that observed during 2006. Timing of egg-laying was significantly earlier than 2006 as well, with a mean laying date of 13 April (versus 26 April in 2006).

JOB/ACTIVITY C: Banding at nests was successful during 2007. A total of 80 fledglings and 30 adult female boreal owls were banded, and an additional 8 adult females were recaptured from previous bandings.

OBJECTIVE 3:

JOB/ACTIVITY A: Annual productivity was assessed at all occupied nest boxes. Data analyses are ongoing in an attempt to assess differences in box occupancy and success rates between different box routes and habitat types.

JOB/ACTIVITY B: During nest box visits in 2007, 795 prey items of 16 species were recorded. As with prior years' data, arvicoline rodents formed the vast bulk of the diet, with passerines being secondary. Eight prey detritus "bricks" from occupied nest boxes used during 2006 were analyzed as well. A manuscript entitled "Post-fledging determination of annual productivity in boreal owls based on prey detritus mass" was accepted for publication in the Journal of Raptor Research. During August and September 2006, 1,233 trapnights on 8 standardized small mammal traplines resulted in the capture of 77 individuals of 6 species. Overall, catch per unit effort declined significantly, indicating that prey availability for boreal owls was low (40% and 6% in 2005 and 2006, respectively). Data are still being analyzed in an attempt to correlate diet of boreal owls as seen in the nest versus what is caught in standard small mammal traplines.

JOB/ACTIVITY C: Efforts are ongoing to describe habitat affinities of all species of small mammals captured on standardized traplines. One-meter radius vegetation plots at small mammal trapsites are generally completed in all available habitat types, and those data are being analyzed to detect avoidance or preference by each species of small mammal captured.

OBJECTIVE 4:

JOB/ACTIVITY A & B: Data analyses are underway on a variety of aspects of boreal owl ecology. A manuscript entitled "Post-fledging Determination of Annual Productivity in Boreal Owls based on Prey Detritus Mass" was submitted and accepted for publication in the Journal of Raptor Research. A manuscript entitled "Factors Affecting Boreal and Great Horned Owl Hooting Surveys in Alaska" is currently undergoing revisions for publication in the Journal of Raptor Research. A third manuscript, "Diet and Prey Consumption Rates of Nesting Boreal Owls, *Aegolius funereus*, in Alaska," was submitted for review to Canadian Field-Naturalist. A photo of a boreal owl with multiple prey items in a nest box was published in National Wildlife Magazine. Additional scientific publications are in progress.

T-3-5.11 Boreal Owls  
FY07 Annual Performance Report

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