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: **5.12**

Project Title: Monitoring raptor nesting fluctuations on Minto Flats State Game Refuge, Alaska

Project Duration: July 1, 2006 – June 30, 2008

Report Period: July 1, 2007 – June 30, 2008

Report Due Date: September 30, 2008

Principal Investigators: Jackson Whitman, Jason Caikoski, Alaska Department of Fish and Game

I. PROBLEM OR NEED THAT PROMPTED THIS RESEARCH

This project focuses on raptor species that use large stick nest platforms visible with aerial survey methods. Preliminary work indicates that 8 species are likely to occur on the Refuge: Bald Eagle, Osprey, Great Gray Owl, Northern Goshawk, Red-tailed Hawk, Rough-legged Hawk, Peregrine Falcon, and Common Raven. Five of these species are ranked S3 by the Alaska Natural Heritage Program (rare or uncommon in state). All of these, except the Raven, are considered to be one of Alaska's Species of Greatest Conservation Needs (CWCS Appendix 7. Nominee Species List, pages 15 and 20), with specific templates developed to address their conservation concerns in Alaska's CWCS. This project addresses all or parts of conservation actions noted in the Northern Goshawk Template, Appendix 4, page 245 issues 4 and 6; the Contaminant-affected Raptor Species Template, page 250 issue 1; the Diurnal Migrant Raptors Template, page 255 issue 3; and the Forest Owls Template, page 263 issue 1 and page 264 issues 3 and 4. In addition to the importance of this data to species management efforts, it will ensure that existing conservation areas, including state special areas, are managed to maintain the wildlife values and use opportunities for which they were designated.

II. REVIEW OF PRIOR RESEARCH AND STUDIES IN PROGRESS ON THE PROBLEM OR NEED

Raptor populations occur at the apex of natural food webs. As such, monitoring their populations may be used as an indicator of diminished capacity of an area to support natural ecological systems. Management of Minto Flats State Game Refuge (Minto) is a state responsibility, and recent interest in natural resource extraction has the potential to degrade existing habitat. Alaska State Statutes establishing the Refuge and the Refuge Management Plan mandate that the Department of Fish and Game manage the refuge to protect and enhance fish and wildlife habitat and conserve fish and wildlife populations and diversity. However, only preliminary information exists on the extent of use of the area by raptors. This investigation is designed to establish baseline data on nesting

raptors, and further, to document specific nesting locations and habitats. Future management of the area (locations of temporary facilities, road corridors, etc.) can be improved if baseline data exist.

Minto Flats State Game Refuge encompasses about 500,000 acres (2,023 km^2) of unique riverine and lacustrine riparian habitats 35 miles (56 km) west of Fairbanks. Because of its proximity to Fairbanks and its world-class waterfowl productivity, it has been subjected to extensive research efforts by the University of Alaska-Fairbanks staff and students, the U.S. Fish and Wildlife Service, and the Alaska Department of Fish and Game Statewide Waterfowl Program. However, basic inventories of other nongame vertebrates have not been undertaken. Because of recent interest in extractable natural resources in and adjacent to the Refuge (including natural gas exploration leasing, white spruce timber harvesting) and aerial military training (supersonic and low altitude), habitat alteration in this pristine area will occur. Baseline information on the extent of use by nesting raptors would be beneficial in future planning and mitigation processes on the refuge.

While extensive use of aircraft for monitoring raptor nesting has occurred in more open habitats in Alaska and elsewhere, little work has been conducted in boreal forest habitats. Through the use of geospatial population estimators (GSPE), we have developed methodologies that adequately provide estimates of the extent of use of the area by raptors and common ravens, as well as providing statistical bounds on those estimates.

III. APPROACHES USED AND FINDINGS RELATED TO THE OBJECTIVES AND TO PROBLEM OR NEED

OBJECTIVE 1: Establish and refine protocol to survey raptor and raven stick nests in interior Alaska's boreal forest lowlands.

We used the distribution of nests located in a 2005 survey to model the predictive ability of varying sample unit sizes for a plot based sampling approach using the geospatial population estimation (GSPE) technique in 2006. The GSPE technique is a finite population version of block kriging that involves measuring spatial correlation among samples, modeling that relationship as a function of distance, and using the model to predict population size.

Based on the modeling exercise, we defined a sample unit for GSPE surveys by 2 minutes of latitude and 5 minute of longitude. We then surveyed 100 of 188 sample units in the study area with fixed wing aircraft to estimate population size for various observable parameters. Overall search intensity averaged 6.12 min/mi^2. When adjusted for available habitat, actual search intensity increased to 6.73 min/mi^2.

OBJECTIVE 2: Based on protocol above, provide baseline population of raptor and raven stick nests on Minto Flats State Game Refuge.

We used GSPE techniques to estimate the observable population size of 18 parameters that were derived from species occupancy and nest structure classifications (Table 1). We calculated a sightability correction factor for total nests based on known nests located in a 2005 survey that were not observed during the 2006 survey. The mean SCF for the 2006

survey was 1.44 (SE= 0.138). Correcting for sightability, we estimated a total of 417 (SE= 49.2) raptor and common raven nests in Minto Flats in 2006.

Table 1. Estimates of nest abundance in Minto Flats in 2006.

Parameter	Estimate	SE
Total Nests	287	19.6
Total Nests with SCF	417	49.2
Total Occupied	102	10.2
Total Absent	181	15.9
Total Good	217	18.1
Total Marginal	13	3.7
Total Poor	53	8.3
BAEA Occupied	24	4.3
BAEA Absent	8	3.1
NOGO Occupied	23	4.6
RTHA Occupied	17	3.6
RTHA Absent	3	1.0
CORA Occupied	21	4.0
CORA Absent	8	3.1
GGOW Occupied	8	2.5
GHOW Occupied	9	3.4
Unk Absent-Good	102	12.6
Unk Absent-Marginal	13	3.7
Unk Absent-Poor	53	8.3

BAEA = Bald Eagle, NOGO = Northern Goshawk, RTHA = Red-tailed Hawk, CORA = Common Raven, GGOW = Great Grey Owl, GHOW = Great Horned. Good = a functionally new nest, recently used and maintained, Marginal = a nest that was not recently used or maintained but potentially functional, Poor = a nonfunctional nest that was partially destroyed, Occupied = nest occupied by a raptor or raven, Absent = a nest not used during that year, SCF = sightability correction factor.

OBJECTIVE 3: For at least 3 raptor species nesting on Minto Flats State Game Refuge, describe nesting habitat affinities based on overstory vegetation classifications.

We broadly classified vegetation types within 100m of nests sites for 275 nests using rotor-wing aircraft (Robinson 44) in 2005-2007. Due to impending retirement of the senior author and no replacement being hired, analyses to describe habitat affinities based on vegetation classification have not been conducted.

OBJECTIVE 4: For at least an additional 2 years, continue spring monitoring of known nest sites to provide information on annual fluctuations in nesting raptors.

In June 2007, we relocated 241 nest sites using rotor aircraft (Robinson 44) to determine species occupancy, productivity, and nest structure mortality. Total survey time was completed in 12.7 hours over two days. After 1 July 2007, no additional field work was conducted on this project. Because of impending retirement of the senior author and no replacement being hired, efforts during FY08 went into data analyses and publications preparation.

IV. MANAGEMENT IMPLICATIONS

Because of recent interest in extractable natural resources in and adjacent to the Refuge (including natural gas exploration leasing, white spruce timber harvesting) and aerial military training (supersonic and low altitude), habitat alteration in this pristine area will occur.

We provided survey protocol and baseline estimates in areas of Minto Flats prior to development. Managers will have the ability to monitor the future status of raptors and common ravens, the effects of development, and provide guidance for appropriate mitigation of roads, facilities, and habitat alteration.

V. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN FOR LAST SEGMENT PERIOD ONLY (July 1, 2007 – June 30, 2008)

JOB/ACTIVITY 4B: <u>During each of the next 2 years, gather information on nest mortality/longevity.</u>

After 1 July 2007, no additional field work was conducted on this project. Because of impending retirement of the senior author and no replacement being hired, efforts during FY08 went into data analyses and publications preparation.

VI. PUBLICATIONS

We prepared and submitted a short manuscript to the Journal of Raptor Research entitled “Peregrine Falcon Nesting in Tree Platform in Alaska”. This manuscript (as of 5 May 2008) was accepted for publication in Journal of Raptor Research.

Prepared By: Jackson Whitman and Jason Caikoski