ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

STATE WILDLIFE GRANT (SWG)

STATE: Alaska **GRANT AND SEGMENT NR.:** T-1-8
PROJECT NR.: 6.0

WORK LOCATION: Juneau and Ketchikan

PROJECT DURATION: 1 July 2002 – 30 June 2003

PROJECT REPORTING PERIOD: 1 July 2002 – 30 June 2003

PROJECT TITLE: Interagency goshawk study on the Tongass National Forest: technical assistance, analysis, and dissemination of results.

Project Objectives:

1. Continue analysis of data collected from 1991 – 1999 and prepare manuscripts on these topics:
    a. Goshawk morphology as related to the status of the Queen Charlotte goshawk (*Accipiter gentilis laingi*);

    b. Description of nest site habitat; and

    c. Estimation of goshawk survival rates based on radiotagged birds.

2. Acquire a more complete sample of habitat data at goshawk nest sites, including (a) collecting samples from more goshawk nest sites; and (b) acquiring and analyzing fixed plot habitat data from the USFS.

Summary of Project Accomplishments:

1. We completed analyses listed in objectives and are in the process of finalizing manuscripts. Some delay in manuscript completion (i.e., publication) will result from processes associated with publication in peer-review journals.

    a. A manuscript on morphology of goshawks from Southeast Alaska and Vancouver Island was presented at the International Symposium on the Ecology and Management of the Northern Goshawk held during the 2003 Annual Meeting of the Raptor Research Foundation in Anchorage, Alaska (Appendix 1). This manuscript is scheduled for publication in the proceedings from that symposium. Funding is being acquired for those proceedings and manuscripts will be assembled by the December 2003 with a tentative publish date of Winter 2004.

    b. A manuscript on northern goshawk nest site habitat data was presented at the North American Ornithological Conference in New Orleans, LA. These data

were then combined with data from a U.S. Forest Service dataset to look at goshawk nesting area preferences. This combined manuscript was presented at the International Symposium on the Ecology and Management of the Northern Goshawk held during the 2003 Annual Meeting of the Raptor Research Foundation in Anchorage (Appendix 2). This manuscript is scheduled for publication in the proceedings from that symposium. Funding is being acquired for those proceedings and manuscripts will be assembled by the December 2003 with a tentative publish date of Winter 2004.

c. A manuscript on northern goshawk survival rates based on radiotagged birds was prepared for the North American Ornithological Conference in New Orleans, LA (Appendix 3). This manuscript is being readied for submission to a peer-reviewed journal.

2. We acquired a more complete sample of habitat data from goshawk nest sites in Southeast Alaska.

   a. We acquired vegetation data at 5 nesting areas during the 2002 field season, including 3 additional nest stands and 5 nest trees. This brings the total to 24 nesting areas within which 33 nest sites and 42 nest trees are described.

   b. We acquired and analyzed habitat data from the U.S. Forest Service's Permanent Plot Grid Database. We used this dataset to generate a sample of random points (n = 479) located throughout the Tongass National Forest to compare with northern goshawk nesting area data to better describe goshawk nesting habitat and understand goshawk selection of certain forest attributes (Appendix 2).

Project Costs: Federal share $24,700 + state share $8,200 = total cost $32,900

Prepared By: Kim Titus, Principal Investigator

Date: 27 August 2003

Appendix 1. Abstract of manuscript on northern goshawk morphology.

SIZE AND COLOR VARIATION OF NORTHERN GOSHAWKS FROM SOUTHEAST ALASKA AND VANCOUVER ISLAND

CRAIG J. FLATTEN, Alaska Department of Fish and Game, Division of Wildlife Conservation, 2030 Sea Level Drive, #211, Ketchikan, AK 99901, USA. ERICA L. MCCLAREN, Ministry of Water, Land, and Air Protection, 2080 Labieux Road, Nanaimo, BC, Canada V9T 6J9.

Two subspecies of Northern Goshawk, hereafter goshawk, are currently recognized in North America on the basis of body size and plumage color: *Accipiter gentilis laingi* and *A. g. atricapillus*. The validity of these subspecies is questionable because descriptions were based on small sample sizes and included museum specimens and wintering individuals. Therefore, we compared size and plumage characteristics from live, breeding adult and juvenile goshawks from relatively large datasets in southeast Alaska (AK) and Vancouver Island (VI). Between 1992-2000 and 1994-2001, adult and juvenile goshawks were trapped at or near 42 and 43 nesting areas in AK and VI, respectively. We collected standard morphological data from trapped individuals. We compared size within age and sex groupings between AK and VI and assessed phenotypes of goshawks within AK, VI, and other western North American study areas. Culmen length, wing chord, hind claw length and mass reflected size (PC1) while tail length, hind claw length and tarsus width reflected shape (PC2) in adult male and female goshawks. VI adults were significantly smaller than AK adults for several PC1 size variables. Individuals from coastal islands in AK were not significantly different in size from individuals from mainland AK. VI males had significantly smaller mean wing chords than males in AK, central British Columbia, Yukon, Olympic Peninsula, Washington, northeast Oregon, and northern Arizona. Our results generally support earlier descriptions of *A. g. laingi* as smaller and darker than cogenerics from other regions of western North America, and confirm the existence of clinal size variation among goshawks of the Pacific Northwest Coast. Inconsistent with earlier studies, we observed a broader range of phenotypes among adults and juveniles for *A. g. laingi*, and found that overall only one-third of individuals from our study areas clearly had dark phenotype Taverner (1940) described as distinct for this race.

Appendix 2. Abstract of manuscript on northern goshawk nesting areas habitat preferences.

NESTING AREA PREFERENCES OF NORTHERN GOSHAWKS (*ACCIPITER GENTILIS LAINGI*) IN SOUTHEAST ALASKA

STEPHEN B. LEWIS and KIMBERLY TITUS, Alaska Department of Fish and Game, Division of Wildlife Conservation, P.O. Box 240020, Douglas, AK 99824, USA. CRAIG J. FLATTEN, Alaska Department of Fish and Game, Division of Wildlife Conservation, 2030 Sea Level Drive, Suite 205, Ketchikan, AK 99901, USA.

We studied northern goshawk nesting area preferences in the temperate rainforests of southeast Alaska. First, we systematically described and quantified goshawk nesting area characteristics at three spatial scales: nest tree, nest site, and nest stand. Next, we assessed nesting area preference by comparing goshawk nest stands with a sample of available forested points. We measured nest and nest tree characteristics at 37 nest trees in 22 nesting areas and measured habitat characteristics at 30 nest sites and nest stands from 21 nesting areas. Goshawks selected the location of their nests at different spatial scales based on forest structure. At the stand scale, goshawks nested in large volume, western hemlock (*Tsuga heterophylla*) dominated forests with relatively dense canopy and shrub layer. Within those stands, nest sites occurred in forest patches containing larger trees on average and an overall higher volume forest, predominately western hemlock. Nest trees were either Sitka spruce (*Picea sitchensis*) or western hemlock, were larger than those around them in the nest site (mean DBH ± SE; 68.7 ± 3.7 cm vs. 47.4 ± 3.4 cm), and were either dominant or codominant in the forest canopy. Goshawk nest stands contained larger trees (35.5 ± 0.4 cm vs. 30.2 ±0.1cm), greater basal area, and fewer trees/ha than available sites. Forest managers in southeast Alaska can ensure that goshawks have nesting habitat into the future by preserving high volume timber stands with large trees and relatively dense canopy.

Appendix 3. Abstract of manuscript on northern goshawk survival.

NORTHERN GOSHAWK SURVIVAL RATES ~~ TONGASS NATIONAL FOREST, ALASKA

KIM TITUS, CRAIG FLATTEN, GREY PENDLETON, RICH LOWELL, AND STEVE LEWIS, Alaska Department of Fish and Game, Division of Wildlife Conservation, Douglas and Ketchikan

Few studies have estimated northern goshawk survival rates (*Accipiter gentilis*). We used radiotelemetry to estimate goshawk survival rates by following adults from 1992 – 2000. Using data from 31 male and 32 female goshawks, we estimated survival by month using program MARK. Mean annual survival of males was 0.59 (SE = 0.10) but was not constant across months, with most male mortalities occurring in late winter. Mean annual survival of females was not constant across months or groups. Resident females had lower survival than movers. Survival estimates for males are among the lowest reported for the species. Possible explanations include transmitter impacts and types of transmitters (tailmounts and 1 – year backpacks on males versus mostly 2 – year backpacks on females). For females, the model that separated movers, residents and first year tagged birds suggests differences among groups. Females that exhibit breeding dispersal among years had much higher survival than females that remained in the same home across years, however part of this analysis is confounded by differing prey on some islands.