Alaska Department of Fish and Game
Division of Wildlife Conservation
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Habitat evaluation techniques for moose management in Interior Alaska

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Research Annual Performance Report
1 July 2007–30 June 2008
Federal Aid in Wildlife Restoration
W-33-6
Study 5.20

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ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
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PROJECT TITLE: Habitat evaluation techniques for moose management in Interior Alaska

PRINCIPAL INVESTIGATORS: Thomas F. Paragi and Kalin A. Kellie

COOPERATORS: Terry Chapin and Jennifer Schmidt (University of Alaska Fairbanks), Rick McClure (National Resources Conservation Service), and Jay Ver Hoef (National Marine Fisheries Service)

FEDERAL AID GRANT PROGRAM: Wildlife Restoration

GRANT AND SEGMENT NO. W-33-6

PROJECT NO. 5.20

WORK LOCATION: Interior Alaska (Region III)

STATE: Alaska

PERIOD: 1 July 2007 – 30 June 2008

I. PROGRESS ON PROJECT OBJECTIVES SINCE PROJECT INCEPTION

Project 5.20 began July 2007.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB/ACTIVITY 1B: Conduct sampling of snow accumulation at the landscape scale to predict snow depth.

To provide options for interim analysis until the LANDFIRE classification specific to Alaska vegetation becomes available (expected in late 2009), we downloaded the National Land Cover Database (NCLD) for Alaska released to the public domain in early 2008 by the U.S. Geological Survey.We reviewed literature on sampling and spatial analysis of snow data at multiple scales, and sampling design was discussed with 2 biometricians and 2 specialists with snow measurement. In early April we acquired 580 snow depth measurements at 56 sites by fixed-wing aircraft north and east of Fairbanks and 106 sites by helicopter south and west of Fairbanks.

JOB/ACTIVITY 1C: Estimate winter habitat use by moose with respect to snow depth.

We reviewed literature on how snow influences habitat use by moose. To better understand sampling issues for habitat use by moose in late winter, we assisted with a moose survey in GMU 19A during 12–14 March to observe moose distribution on the landscape and track patterns among vegetation types in conditions of relatively deep snow. This unit was included in the snow depth sampling 3 weeks later (Job 1b).

We began assembling historic data on moose locations in winter to understand the degree to which habitat use is influenced by snow depth. GPS locations for individual moose were obtained during recent late winter surveys in GMUs 19A and 21E, but the data sheets were destroyed when the McGrath office burned in 2006. We obtained duplicate copies for surveys in February 2000 and 2005 (GMU 21E) and February 2001 and 2005 (GMU 19A) from the regional office and from the Bureau of Land Management. Winter telemetry data were available for moose in eastern Unit 19D during 2001–2008 as part of ongoing predator–prey research near McGrath, so we outlined a protocol with the researcher who collected those data to evaluate change in habitat selection during deep snow winters.

JOB/ACTIVITY1D: Construct a spatial model of winter range use by moose.

We continued to obtain literature on the job topic. During April 2008 we acquired snow depth data at several spatial scales (Job 1b) and examined options for modeling moose winter habitat after observations made during the moose survey in GMU 19A (Job 1c).

JOB/ACTIVITY2A: Estimate browse production (kg/ha) and proportional removal.

No work was completed during this reporting period.

JOB/ACTIVITY 2B: Conduct moose twinning surveys in browse surveys areas.

The assistant area biologist for Galena conducted twinning surveys in GMU 24B during 27–31 May to complement a browse survey conducted in April 2007 under Federal Aid Project 5.10.

Various electronic files of moose survey data back to 1970 were compiled into a single spreadsheet for several game management units in the Interior as a starting point. We coordinated with the facility manager at our regional office to obtain use of a heated storage room as an archive facility and set up shelving units and a map cabinet for organizing hard copies of data previously stored at various locations. We also began collaborating for mutual benefit with a UAF professor (Chapin) and post-doctoral student (Schmidt) who are forecasting the effect of climate change on ecosystem services (which requires reconstructing historic spatial trends), including provision of moose meat in the boreal forest. Initial archive efforts were focused on GMUs 25D, 21D, and 20A that represent low, moderate, and high moose density, respectively. We created an electronic archival database, and a temporary student employee began logging entries.

JOB/ACTIVITIY 4A: Write annual progress reports, a research interim technical report in FY10, and a final technical report. Give presentations at scientific forums, particularly in Alaska. Publish results in peer-reviewed journals for jobs where results have utility outside Region III.

Kellie wrote a memo describing preliminary results of the snow survey to aid in discussions of analysis techniques with a biometrician and is preparing to post the snow depth data collected during the survey to the National Snow and Ice Data Center website <http://nsidc.org/data/gis/data.html>.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

None.

IV. PUBLICATIONS

None.

V. RECOMMENDATIONS FOR THIS PROJECT

Snow depths collected during the 2008 survey will be combined with data collected by other statewide cooperators (coordinated through National Resources Conservation Service) and used to build a preliminary model of April snow depth for Interior Alaska. Based on the preliminary correlations we found for snow depth at various spatial scales in 2008, it is our recommendation that this model use a coarse prediction level (subunit). Additional sampling will be needed to verify model predictions and to fine-tune estimates for the northern Interior game management units, but this could be done in the future as management needs arise in specific areas. We anticipate in FY09 to determine (1) the appropriate scale of snow depth analysis, (2) whether observations at snow stakes by midwinter are adequate for predicting a deep snow winter for moose, (3) whether the spatial relationship of deep snow among subunits is fairly consistent among years, and (4) how the frequency of deep snow winters varies among subunits (i.e., define subunits where a shallow snow model alone is adequate).

Subunits of GMU 19 had few historical data (except for the McGrath airport) yet represented the majority of deep snow subunits among those sampled in 2008, a pattern supported by observations of long-term pilots. Therefore, we recommend that reading of the snow stakes deployed in GMU 19 in spring 2007 be incorporated into the moose management program for the McGrath Area to understand multi-year variation in depth and its effect on habitat selection and survival of moose. Monthly flights (Jan–Apr) to read gauges could be combined with fur sealing, license sales, and advisory committee meetings to make collection of snow data more efficient.

Interim products from this research could benefit management decisions, including review of population objectives for intensive management in selected units at the March 2009 and March 2010 meetings of the Alaska Board of Game. Until the LANDFIRE classification is available, we will use the NLCD classification to define the vegetated areas within each subunit in the Interior as an approximation of summer habitat. Winter habitat will be modeled from vegetated cover types, historic snow depth, and winter habitat selection by moose in GMU 19D (telemetry data, 2001–2008). The habitat selection model will be evaluated for application to a larger landscape using moose locations from GMUs 19A and 21E (GPS locations of unmarked animals during 2 Feb surveys in each subunit, 2000–2005). The objectives are to (1) evaluate vegetative classification and other remotely-sensed habitat parameters (e.g., proximity to rivers that may have frozen overflow and act as movement corridors) in the prediction of winter moose range; and (2) define the appropriate scale for modeling habitat selection in contrasting snow conditions (shallow and deep snow).

VI. APPENDICES

None.

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