

**FEDERAL AID ANNUAL  
RESEARCH 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  
Wildlife Restoration Grant**

**GRANT NUMBER:** W-33

**SEGMENT NUMBER:** 11

**PROJECT NUMBER:** 1.69

**PROJECT TITLE:** Movements and sightability of moose in Game Management Unit 21E

**PROJECT DURATION:** 1 July 2009–30 June 2014

**REPORT DUE DATE:** 1 September 2013

**PARTNER:** None

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

**COOPERATORS:** Geoffrey Beyersdorf, and Bruce Seppi, U.S. Bureau of Land Management; and Jerry Hill and Steven Kovach, U.S. Fish and Wildlife Service

**WORK LOCATION:** Interior Alaska, Unit 21E

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**I. SUMMARY OF WORK COMPLETED THIS SEGMENT ON JOBS IDENTIFIED  
IN ANNUAL WORK PLAN**

OBJECTIVE 1: Determine seasonal movements of moose that overwinter in the Yukon and Innoko River floodplains to assist managers in defining winter range, spring calving areas, and moose distribution during hunting season and periods of aerial surveys in autumn (age-sex composition) and late winter (abundance).

JOB/ACTIVITY 1B: Obtain GPS and VHF relocations.

We continued to archive GPS data after weekly downloads from the ARGOS satellite system and distribute data monthly to federal cooperators until November 2012. We then contracted with ABR, Inc. of Fairbanks to create a program that automatically downloads ARGOS data weekly for multiple GPS projects in our region and codes it by animal ID (thus reducing potential for error in manual entry) into a Microsoft Access® (Microsoft Corporation, Redmond, Washington) database maintained on the ABR server. We keep a copy of the database on our agency server and periodically download only new records over the internet. The agency database structure was sent to federal cooperators with data up through February 2013 and instructions for use. A password specific only to Unit 21E was provided to access to the ABR server for downloading new records.

The McGrath Assistant Area Biologist conducted VHF telemetry flights to verify presence of calves with collared cows and found 23 females on 28–29 November 2012, but only 1 female was observed in April 2013 before a mechanical problem developed with the airplane (auxiliary fuel pump failed, greatly reducing flight range). A survey on 29–30 May 2013 by USFWS cooperators was unable to use telemetry for collared females because an electrical problem developed with the plane but found 56 random parturient cows for an estimated twinning rate of 32%. A table of maternal reproductive history and calf survival during intervals between VHF telemetry was updated, and we submitted data to a biometrician for a bootstrapping estimate of twinning rate during 2010–2013. We retrieved 5 GPS collars from field mortalities in July 2012 by helicopter and recovered 1 GPS collar from a hunter in fall 2012, and USFWS personnel downloaded the data stored in the collar. VHF data since project inception were collated for future entry into the new database structure.

JOB/ACTIVITY 1C: Define seasonal ranges of moose for planning survey and inventory activities and to aid management decisions.

We continued to collect data for a multi-year assessment. Kellie Seaton met with a researcher from Sweden, Dr. Navinder Singh, to learn about an analytical method for defining nodes of spatial use. This procedure can be a means of assigning periods of slow and rapid movement to objectively define seasonal ranges and intervening migration periods, respectively.

OBJECTIVE 2: Use radiomarked moose to develop a sightability correction factor (SCF) for late winter surveys using a geospatial population estimator (GSPE) for moose abundance in Unit 21E.

JOB/ACTIVITY 2A: Estimate SCF by intensively searching a randomly-located quarter of randomly sub-sampled GSPE cells during a population survey in Unit 19A (late winter 2011) (job modified in study plan 14 December 2010).

We finished revisions on a draft memo describing details of the March 2011 intensive SCF survey in Unit 19A to provide advice to the Nome Area Biologist in design of a similar survey for Unit 22 in February 2013. The original data sheets for the Unit 19A survey were scanned and both the hard and electronic copies were sent to McGrath for storage, with the redundant electronic version kept in Fairbanks.

JOB/ACTIVITY 2B: Estimate an SCF by intensive searches and by detection of radiomarked moose during a population survey in Unit 21E (late winter 2012).

The draft memo on the 2012 survey was reviewed but not finalized; it requires consultation with our cooperating biometrician but has been a lower priority than his other assignments.

OBJECTIVE 3: Create an electronic archive as a GIS shapefile of moose relocations with associated attributes and metadata.

JOB/ACTIVITY 3: GPS data download and archive.

We continued weekly amending of data downloads to the online database until the service was automated in November 2012 (job 1b).

OBJECTIVE 4: Write annual progress reports 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.

JOB/ACTIVITY 4: Write progress report and give scientific presentations.

We finalized a draft research memo on the 2011 survey (job 2a) and completed this FY13 performance report.

**II. SIGNIFICANT DEVIATIONS AND/OR ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD**

None.

**III. PUBLICATIONS**

None.

**IV. RECOMMENDATIONS FOR THIS PROJECT**

We will continue archiving literature on analyzing movement for jobs 1c and 1d to have the data analysis algorithms in place for when the GPS collars are removed in March 2014 and the full data sets are downloaded.

**PREPARED BY:** Thomas F. Paragi

**DATE:** 15 August 2013