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-33-8

PROJECT NUMBER: 3.49

PROJECT TITLE: Development of methods to assess effects of oil field infrastructure on caribou movements, growth, and survival

PROJECT DURATION: 1 July 2006–30 June 2012

REPORT PERIOD: 1 July 2009–30 June 2010

REPORT DUE TO HQ: 1 September 2010

PRINCIPAL INVESTIGATOR: Stephen M. Arthur

WORK LOCATION: Central Arctic coast

COOPERATORS: U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, National Park Service

I. PROBLEM OR NEED THAT PROMPTED THIS RESEARCH

The Central Arctic caribou (*Rangifer tarandus*) herd (CAH) is the only Alaskan caribou herd that currently experiences extensive contact with industrial oil development. Although the herd increased during previous phases of development in the Prudhoe Bay and Kuparuk oil fields, most of the increase occurred outside of developed areas. Further development is likely to reduce the amount or quality of habitat currently available for calving. In addition, increased knowledge of the suitability of various habitats for caribou calving will facilitate the development of effective mitigation measures that may reduce impacts of future development projects.

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

Previous studies indicated that during the calving season (late May–late June) pregnant caribou cows and those with newborn calves avoid areas subject to disturbance caused by human activities associated with oil extraction. For example, during the 1990s, the area of greatest concentration of calving by the CAH shifted southward as development of oil-related infrastructure occurred in what was originally the core calving area. However, caribou males and nonpregnant females may habituate to some levels of oil field activity and it is unknown whether the shift in calving locations resulted in negative consequences for either calf production (birthrate) or calf survival. In fact, the CAH increased from 19,000 to 27,000 caribou between 1991 and 2000. However, this increase occurred primarily in areas that were not affected by oil field infrastructure. Thus, possible effects of development on the CAH have been obscured by effects of unrelated events (primarily weather and cyclic changes in herd size).

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

This project will complete collection and analysis of data concerning movements, growth rates, and survival of caribou from the CAH in relation to the oil field complex near Prudhoe Bay, Alaska. Data collection for this work began in 2001 as part of project 3.46. In addition, this project will fund a cooperative agreement with research staff at a university to develop a method of modeling animal movements using autocorrelated GPS locations. These models will then be used to assess potential effects of anthropogenic disturbance on movements and habitat use of caribou, and how changes in caribou behavior due to disturbance may affect growth and survival of caribou calves.

IV. MANAGEMENT IMPLICATIONS

None.

V. SUMMARY OF WORK COMPLETED ON JOBS FOR LAST SEGMENT PERIOD ONLY

JOB/ACTIVITY 5a: Develop models of caribou movements

Accomplishments: No progress was made on model development due to lack of funding for a cooperative agreement with university researchers. However, contacts were established with scientists at the University of Idaho and plans are underway to develop a cooperative research agreement with them to proceed with this work beginning in January 2011.

JOB/ACTIVITY 8a: Prepare annual report, travel to meetings and conferences

Accomplishments: No activity.

VI. PUBLICATIONS

None.

VII. RECOMMENDATIONS FOR THIS PROJECT

Extend the project through 2012.

Prepared by: Stephen M. Arthur

Date: 20 August 2010