# 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:** 9

**PROJECT NUMBER:** 14.25

**PROJECT TITLE:** Evaluating methods to control an infestation by the dog louse (*Trichodectes canis*) in gray wolves

**PROJECT DURATION:** 1 July 2006–30 June 2012

**REPORT DUE DATE:** 1 September 2011

**PRINCIPAL INVESTIGATORS:** Craig L. Gardner and Kimberlee B. Beckmen, ADF&G

**COOPERATOR:** None

**WORK LOCATION:** Units 20A and 20C

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

### OBJECTIVE 1: Determine extent of louse infestation in wolf packs in Unit 20A using visual observations of live wolves and hide inspections of trapper-caught wolves.

To determine the extent of lice infestation of wolf packs in the treatment area in Unit 20A, we attempted to inspect multiple wolves from all packs by capture and by purchasing pelts of wolves caught by trappers. We live-captured wolves during October–December and February–April 2005–2009 and February 2010 by darting from a helicopter. We visually inspected for signs of hair damage, skin lesions, and for lice using a 10× magnification loop. Lice and associated skin lesions were most likely to be recognized in the groin area so a thorough inspection using additional artificial light occurred in this area. Skin biopsies were obtained from 3 sites for histopathological confirmation of pediculosis. Skin biopsy samples were taken along the midline between the shoulders, lateral thigh, and groin areas with a 6 mm disposable biopsy punch. Biopsies were placed in 10% neutral buffered formalin, then once at the laboratory, stained with hematoxylin and eosin and examined microscopically by a board certified veterinary pathologist. We also requested trappers to bring us wolves and coyotes that were harvested within our treatment and control (Unit 20C) areas regardless if we previously sampled the pack. After a thorough visual inspection, we purchased all pelts of both species that were suspected to be infested with dog lice. We verified presence/absence of dog lice by using potassium hydroxide hide dissolution (KOH). This method was determined to have the highest sensitivity and specificity and would detect as few as 1 louse per wolf.

*JOB/ACTIVITY 1:* We conducted monthly literature reviews.

Federal funds were used to pay salaries while working on this task. We reviewed published literature and management reports concerning lice infestations on wolves, coyotes, and domestic dogs for comparisons to our methods and results. We also reviewed literature and consulted with colleagues on treatment and detection methods for other types of ectoparasites on canids that we could apply to managing dog lice on wolves.

**OBJECTIVE 2: Determine efficacy of den/rendezvous site treatment to manage lice infection.**

We treated dog lice infestations by aerially distributing ivermectin-injected baits at dens and rendezvous sites of infested packs every 10–20 days during May–August 2005–2007. Overall, each pack received 7–8 treatments. For each treatment period, dosage per bait and numbers of baits varied. Dosages varied by pup age and the number of baits dropped at each den or rendezvous site was dependent on pack size and the number of wolves present. Dosage per bait was based on estimated wolf weights by age and the dosage given safely to wolves previously (albeit by intramuscular and subcutaneous injection) of 0.4 mg/kg. We completed 3 adult treatments/pack/year during the onset of denning (early May) to 19 June. This period coincides to when pups were 0–4 weeks old and mainly in the den so therefore mostly safe from contacting an adult dose. The adult dose was 12 mg/bait. We also dropped baits to radiocollared wolves and associates along their direction of travel or in close vicinity of a kill when they were away from the den or rendezvous site if it seemed likely that these wolves would find the baits. When distributing adult baits we flew around during midday to maximize the chance of encountering adults at the den or rendezvous site. After 19 June we reduced the dosage to safely treat pups as they began to move out of the den. We completed 4–5 pup treatments/pack/year. During these periods when we were targeting pups we visited sites during the early morning because adults were more likely to be away from sites on hunting excursions. We evaluated treatment effect by either collecting 1 pup and by purchasing wolf hides from trappers from all treated and untreated radiocollared packs. We obtained wolves from untreated packs to monitor lice transmission and to determine re-infestation rates of packs previously treated. Over the course of the study, we monitored 3 packs that were lice-infested and remained untreated as a control. We annually obtained ≥1 wolf either from trappers or by field collection from each of these packs to inspect for lice. We used KOH hide dissolution to evaluate treatment success.

**OBJECTIVE 3: Establish rate of transmission between packs.**

During the study, we evaluated effects of wolf densities, removal rates including dispersal, and climatic factors on lice transmission. For all analyses, we defined the biological year as 1 May–30 April, closely coinciding with pup production. We estimated fall (15 October–15 November) and spring (1–15 March) wolf densities in the treatment area by dividing the total number of wolves in radiocollared packs by the size of the aggregate area of the home ranges of those packs including areas between territories too small to support other wolves. We located all radiocollared packs 1–8 times/month. We monitored mortality and dispersal using fate of radiocollared wolves and ADF&G harvest records. Our estimated annual removal rates were a combination of mortality and long distance dispersal. Mortality was categorized as conspecific, other natural kills, and human-caused. We estimated age specific removal rates and survival using a Kaplan-Meier staggered-entry design for telemetry studies. As wolves dispersed from their natal areas, we attempted to monitor these to determine the type of dispersal and the

outcome. We categorized dispersals as either local (wolves left their natal range but remained within the study area) or long-range (wolves left the study area). We evaluated lice transmission between packs relative to short- and long-distance dispersal and turnover rates of dominant wolves within those packs during periods when there was a local source population of lice and after the source population was eliminated. We summarized average temperature and precipitation levels for the 3 areas of Alaska where lice infestations on wolves were found.

*JOB/ACTIVITY 2*: Wolf collection and sampling.

Federal funds were used to pay salaries while completing this task. All wolf and coyote pelt samples collected during the study have now been analyzed for lice presence. We verified that none of the wolves in 19 packs or any of 3 coyotes sampled in the treatment area were infested with dog lice during FY11.

*JOB/ACTIVITY 8*: Data analysis and report preparation.

Federal funds were used to pay salaries while completing this task. We completed a draft manuscript to be submitted to a peer reviewed journal. We also presented our results at 2 professional conferences.

**PREPARED BY:** Craig L. Gardner

**DATE:** 9 August 2011