ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
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Alaska Department of Fish and Game
Wildlife Restoration Grant

Grant Number: AKW-10 Wildlife Restoration FY2016

Project Number: 14.30

Project Title: Wolf population estimation on Prince of Wales Island, Alaska

Project Duration: 1 July 2015–30 June 2019

Report Due Date: 1 September 2016

PRINCIPAL INVESTIGATOR: Gretchen Roffler

COOPERATORS: USFS Tongass National Forest, Rocky Mountain Genetics Laboratory, The Nature Conservancy

WORK LOCATION: Prince of Wales Island and Ketchikan, Alaska (RI)

I. PROGRESS ON PROJECT OBJECTIVES DURING LAST SEGMENT

OBJECTIVE 1: DNA-based population estimates.

OBJECTIVE 2: Monitor wolves with trail cameras

OBJECTIVE 3: Live-capture and radio collar a sample of wolves on POW

OBJECTIVE 4: Assess effectiveness of methods for application to region-wide monitoring.

OBJECTIVE 5: Data synthesis and preparation of publications

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

JOB/ACTIVITY 1A: We will collect hair samples from lured hair-snare boards and identify individuals from DNA**.**

Accomplishments: We established 82 hair snare stations throughout the same study area used in 2014, in central Prince of Wales Island (POW). Ten new hair snare stations were added to the 72 stations used in 2014. Stations were monitored weekly during 26 October – 23 December 2015 by 4 field crew staff. Icy road conditions inhibited regular hair-snare monitoring during late November – December. Wolves visited and left hair at 27 (33%) of the 82 stations.

On 19 January 2016, we sent 232 hair samples collected from the snares to USFS Rocky Mountain Research Station in Missoula, MT for genotyping. The objectives of sample analyses were to genetically identify unique wolves from the hair

samples using ten microsatellite loci and compare these individuals to those identified during 2012 – 2014.

DNA extractions were performed on the hair samples using the standard protocols (targeting 10 good hairs with follicles for the extraction). Of the 232 extracted hair samples, 184 successfully amplified at the 16S region of the mitochondrial genome (79.3%). Of these, 136 were assigned to canids (wolf or dog), 43 to black bear (*Ursus americanus*), and 5 to non-target species.

We analyzed DNA for individuals using a panel of ten variable microsatellite loci. These loci provide an acceptable cumulative probability of individual identity (PID= $5.35x10^{-7}$, or 1 in 2,298,318 chance that two samples are identified as the same individual when they are instead from different individuals). We analyzed 136 hair samples identified as wolf/dog from the species identification analysis plus 5 samples from live-captured and harvested wolves, bringing the total number of samples to 141.

We obtained DNA for individual identification from 106 of the 136 hair samples identified as dog/wolf (77.9%), plus suitable DNA from all five aforementioned live-capture samples for a total of 111 genotyped samples. Of these, 102 samples amplified with alleles consistent for gray wolves in Alaska, representing 31 individuals. Seven of these 111 samples amplified with alleles consistent for suspected domestic dogs and represent five individuals. Seven of 31 wolves captured in 2015 were recaptures previously detected in 2013 and 2014. Samples were tested for sex and we identified 15 males and 16 females (five males and two females were recaptures).

JOB/ACTIVITY 1B: Uniquely identified wolves will be used in spatially explicit capture-recapture (SECR) models to estimate population density for the study area.

Accomplishments: We used SECR models to estimate the density and population size of wolves in our study area and in GMU 2. The density estimate from the fall 2015 top-ranked SECR model was 11.9 ± 2.7 wolves/1,000 km^2 (95% CI = 7.7–18.5 wolves/1,000 km^2; CV = 0.228). Using this density estimate to predict the number of wolves in the study area (3,280 km^2) resulted in an estimate of 42.5 ± 6.3 (95% CI =33.7–59.6), and a fall 2015 population size for GMU 2 of 107.5 ± 24.5 wolves (95% CI = 69–167). This estimate was significantly higher than the previous year assessed by generating bootstrapped 95% confidence intervals of the difference between estimates on the original log scale using 5,000 replications.

JOB/ACTIVITY 2A: We will deploy and monitor motion-detecting trail cameras throughout the study area.

Accomplishments: During the hair-snare monitoring period we established 76 cameras at the hair-snare stations. We set up 23 of the hair-snare stations with at least 1 camera, and 11 of the stations had sufficient cameras to record wolf activity

at all 5 of the hair boards at the station. Cameras were monitored weekly, photos were downloaded, and data recorded in a data management system.

JOB/ACTIVITY 2B: We will use camera results to characterize use of den sites, hair boards, and to estimate occupancy of wolves in the study area.

Accomplishments: We established cameras at 4 active den sites during May – June 2016 and recorded activity of breeding wolves and their pups.

During the hare snare monitoring period, wolves were captured on camera investigating and rolling on the hair boards on 10 occasions. However, there were also occasions when wolf hair was deposited at the station and the cameras did not record the event, underscoring the need to investigate causes of camera failure. A pilot study was initiated to investigate the effects of camera model, brand, weather, distance from target, and different camera settings on animal capture success rate in motion-detecting cameras. We also purchased 60 Reconyx HC600 cameras to replace the Moultrie M990i models after determining that the former camera type had better overall performance.

We established an improved camera card upload and data management system for archiving the photo data and for use in future analyses. During this reporting period there was a considerable effort to upload photos (approximately 750,000) from cameras used during the first half of this project (2012 – 2014). We have compiled initial data sets to be used in occupancy analyses, which will be completed during FY 2017.

JOB/ACTIVITY 3A: We will use foot-hold traps to capture, chemically immobilize, and radiocollar wolves.

Accomplishments: One female wolf (201601) was captured in coordination with a local POW trapper on 12 January 2016. We did not attempt to capture any other wolves during this study period.

JOB/ACTIVITY 3B: We will aerially track radiocollared wolves with telemetry, observe wolves to obtain counts visually, and download location data remotely approximately every 2 weeks.

Accomplishments: During the reporting period we monitored radiocollared wolves. We conducted 18 tracking and download flights and downloaded GPS locations for analyses of pack home range size and movement patterns.

JOB/ACTIVITY 4: We will continue to assess the effectiveness (in terms of cost, effort, reliability, and appropriate spatial scale) of these monitoring methods and the potential for application to a long-term monitoring program in GMU 2 and to other areas in Region I.

Accomplishments: We used data collected during 2012 – 2014 to assess the effectiveness of 2 methods (radiocollaring wolves, and non-invasive based capture-recapture) to estimate wolf population abundance on POW. We compared

estimation methods for reliability, cost, and effort for application to regionwide monitoring. We found that in our study area the noninvasive DNA-based method proved to be more robust, precise, efficient, and cost-effective than the traditional method. We replicated the same population estimation methods that had been previously used on POW relying on radiocollar data, and determined that the method was imprecise and sensitive to violations of model assumptions. The trapping and radiocollaring method was nearly 12 times more expensive than identifying individual wolves genetically, and required more trapping effort. The noninvasive DNA-based method produced a robust population estimate along with a measure of precision once we increased the sampling area and intensity (2013 – 2015). Results from this assessment are detailed in the publication by Roffler et al. (2016).

JOB/ACTIVITY 5: We will synthesize data collected from the various methods, and will prepare final reports and publications.

Accomplishments: We established an updated data management system to synthesize existing Region I wolf records, and used these data to conduct analyses (described above). We published research report WRR-2016-1. We also published a "Wolf Trails" newsletter for the general public and distributed it to POW residents.

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

None.

IV. PUBLICATIONS

Roffler, G. H., J. N. Waite, R. W. Flynn, K. R. Larson, and B. D. Logan. 2016. Wolf population estimation on Prince of Wales Island, Southeast Alaska: a comparison of methods. Alaska Department of Fish and Game, Final Wildlife Research Report ADF&G/DWC/WRR-2016-1, Juneau.

Wolf Trails - Management and research update for Prince of Wales Island. Alaska Department of Fish and Game. Juneau, AK. Edited by Abby Lowell.

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Submitted by: Anthony Crupi, Acting Research Coordinator

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