Alaska Department of Fish and Game
Wildlife Restoration Grant

Grant Number: AKW-4 Wildlife Restoration Grant FY2015

Project Number: 4.43

Project Title: Spatial relationships, harvest vulnerability, and harvest rates of brown bears on the northern mainland coast of Southeast Alaska

Project Duration: 1 July 2009–30 June 2016

Reporting Period: 1 July 2014 – 30 June 2015

Report Due Date: 1 September 2015

Principal Investigators: Anthony Crupi, Rodney Flynn, LaVern Beier

Cooperators: Wrangell-Saint Elias National Park & Preserve

Work Location: Mainland coast of Southeast Alaska from Glacier Bay National Park to Icy Bay, including the Yakutat and Malaspina Forelands

I. PROGRESS ON PROJECT OBJECTIVES DURING LAST SEGMENT

OBJECTIVE 1: Describe seasonal spatial relationships of brown bears in a portion of GMU 5 including seasonal home ranges and habitat selection.

Since the inception of the study, we have captured and GPS radiocollared 92 brown bears (49 males, 43 females) in game management unit (GMU) 5A. Of these, 22 brown bears (15 males, 7 females) were captured at the landfill in Yakutat. In GMU 5B, we captured and deployed GIS collars on 18 brown bears (10 males, 8 females).

By the end of the reporting period, we had retrieved 81 GPS radiocollars from 68 individual bears. We have performed preliminary analyses of location data investigating seasonal movement patterns, animal home range size, and den site selection.

OBJECTIVE 2: Estimate harvest rate of brown bears.

We sent 201 tissue samples collected between 2009 and 2015 to Wildlife Genetics International (WGI) for DNA analysis. We collected 170 samples in GMU 5A, and collected 31 samples in GMU 5B. We collected DNA tissue samples from live-captured bears (114), hunter-harvested bears (75), and other human-caused mortalities (12).

OBJECTIVE 3: Estimate the density of brown bear on the Yakutat Forelands

In 2013, we modified the project to include a population estimate of brown bear density and abundance within the Yakutat Forelands study area based on a DNA-based mark-recapture experiment. We collected 569 samples from 490 hair snares, 269 samples from 41 scent-baited barbed wire corrals, and 11 samples from 6 rub trees. We received genotyping results and are currently modeling the population density and abundance in a spatially-explicit capture recapture framework.

OBJECTIVE 4: Characterize bear den selection

In 2013, we modified the project to include an evaluation brown bear dens within the Yakutat Forelands study area. We located brown bear dens from tracking the radiocollared bears and from aerial surveys in the spring. We described the attributes of the dens sites and then compared that attributes with random (available) location.

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

JOB/ACTIVITY 1a: Capture bears, deploy GPS radiocollars

Accomplishments: We captured 16 brown bears (11 males, 5 females) in GMU 5A during the reporting period. The bears were processed and outfitted with GPS-equipped radiocollars. Using standard helicopter darting and foot snaring techniques, we captured 11 bears on the Yakutat Forelands and 5 bears at the Yakutat landfill. Two of the captured bears had been previously radiocollared; we retrieved the collar from one male and deployed a new GPS radiocollar on the adult female.

JOB/ACTIVITY 1b: Retrieve collars

Accomplishments: By the end of the reporting period, we had retrieved 81 GPS radiocollars from 68 individual bears.

JOB/ACTIVITY 1c: Download and analyze location data.

Accomplishments: Brown bear GPS radiocollar data have been downloaded and entered into a geographical database. The location data have been analyzed according to seasonal movement patterns, animal home range size, and den site selection.

JOB/ACTIVITY 1d: Prepare reports and publications

Accomplishments: In addition to preparing an annual progress report, we completed and published a final wildlife research report detailing the research conducted near the Malaspina Glacier titled, "Movement patterns, home range size, and resource selection of brown bears near the Malaspina Glacier, Southeast Alaska".

JOB/ACTIVITY 2a: Collect DNA samples

Accomplishments: We collected DNA from 13 live-captured brown bears, 5 harvested bears, and 5 other human-caused mortalities in GMU 5A. The DNA samples have been processed and archived. The bears harvested in the fall season were sent to WGI for DNA analysis and those collected in the spring will be submitted to WGI in the autumn.

Job/Activity 2b: <u>Estimating harvest rate</u>

Accomplishments: At the conclusion of the project we will estimate harvest rate using a closed population model in Program MARK. The live-captured and hair-snare samples will constitute "marked" samples and hunter-harvested bears will constitute recaptures.

Job/Activity 3a: <u>Estimating the density of brown bears in the Yakutat Forelands</u>

Accomplishments: We collected 849 hair samples for the GMU 5A brown bear density estimate. We collected 569 samples from 490 hair snares, 269 samples from 41 scent-baited barbed wire corrals, and 11 samples from 6 rub trees. We received genotyping results from WGI and are currently modeling the population density and abundance in a spatially-explicit capture recapture framework. We will complete the analyses and draft report by 31 December 2015.

Job/Activity 4a: <u>Locate brown bear dens from tracking the radiocollared bears and from surveys in the spring.</u>

Accomplishments: We have identified 60 brown bear dens from radiotracking GPS collars in the Yakutat Forelands. We also identified 28 brown bear den sites during aerial surveys conducted along a 2000' contour.

Job/Activity 4b: <u>Describe the attributes of the dens sites and then compare those attributes with random (available) locations.</u>

Accomplishments: We developed a prioritized list of brown bear den sites to assess den site selection and we will visit those den sites in the upcoming year. We also have developed a suite of habitat and terrain factors to be used in a resource selection function model. To date, we have located 9 den sites on the ground and described their attributes in relation to den site selection.

III. Not applicable

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

None.

V. PUBLICATIONS

Crupi, A. P., R. W. Flynn, L. R. Beier, D. P. Gregovich, and J. N. Waite. 2014. Movement patterns, home range size, and resource selection of brown bears near the Malaspina Glacier, Southeast Alaska. Alaska Department of Fish and Game, Final Wildlife Research Report. ADF&G/DWC/WRR-2014-2, Juneau, AK, USA.

VI.   RECOMMENDATIONS FOR THIS PROJECT

In the upcoming year, we will conclude field work in Yakutat following objectives and job activities outlined in the current project statement.

Prepared by: Anthony Crupi, Wildlife Biologist III

Submitted by: Rodney W. Flynn, Research Coordinator

Date: 1 September 2015