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-33-8** **Segment Number: 1**

Project Number: 4.42

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

Project Duration: July 1, 2009 – June 30, 2012

Report Period: July 1, 2009 – June 30, 2010

Report Due Date: September 1, 2010

PRINCIPAL INVESTIGATORS: Rod Flynn, Research Coordinator, ADF&G

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

I. PROBLEM OR NEED THAT PROMPTED THIS RESEARCH

Little biological information is available to guide brown bear management on the northern mainland coast of Southeast Alaska, in particular the area from Glacier Bay National Park to Icy Bay near Yakutat. Recently, brown bear studies have been completed on Admiralty and Chichagof Islands (Schoen and Beier 1990, Titus et al. 1999, Flynn et al. 2007). In 2004, the first brown bear study on the mainland coast was initiated (Flynn 2006), and a subsequent study on the central coast (Berners Bay) was started in 2006 (Flynn et al. 2008). These studies are now near completion. In contrast, no research has been attempted on brown bears along the northern mainland coast.

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

The Yakutat and Malaspina Forelands and adjacent areas present unique management and ecological issues for brown bears. A substantial portion of the annual hunter-harvest in Southeast Alaska comes from Unit 5 (average = 16.6%). Over the past 10 years, the annual hunter take has averaged 34 brown bears in Unit 5, ranging from 27 to 41 bears. In Unit 5A, the brown bear harvest has averaged 27.7 bears with 6.3 bears taken in Unit 5B. Currently, the guideline harvest for Unit 5A has been set at 30 bears, which is nearly 6% of the estimated 522 bears. This harvest rate exceeds the usual guideline harvest rate of 4% for most brown bear populations in Southeast Alaska. Although age structure of the harvest and skull sizes have not shown any significant trends over the past 10 years, Department management staff are concerned that current harvest levels may not be sustainable because actual population numbers may be less or the harvest rate may be excessive. Also, non-hunting mortality (i.e. defense of life and property kills) has been

significant in some years. In 2003, 11 additional bears were killed; raising total brown bear mortality to 37, which was well above the guideline of 30 bears.

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

The objective of this project is to provide information on the brown bear population in the northern mainland coast of Southeast Alaska. These studies will provide information on the spatial relationships, harvest vulnerability, and harvest rates of brown bears in a portion of Unit 5. The results from these studies will be analyzed and reported to provide managers with appropriate population information with which to develop management strategies for brown bears in the area.

Beginning in early summer, up to 25 adult brown bears will be captured by darting from a helicopter along the beach or by foot-snaring along salmon streams (Flynn et al. 2007). The bears will be injected with Telazol® (Fort Dodge Animal Health, Fort Dodge, Iowa, USA) for immobilization at a dosage of 7-10 mg/kg estimated body weight. All captured bears will be measured, ear-tagged, and a GPS collars attached. In order to collect frequent, precise bear locations, GPS-equipped collars (Telonics Models TGW-3600, 3700, 3790, or 4700, Telonics, Mesa, AZ) will be deployed on all captured adult brown bears. GPS receivers in the collars will be set to collect location fixes every 30 minutes from deployment until November 15. In order to conserve battery life during the denning period, the fix acquisition rate will switch to 1 fix per day until April 1, and then return to the original acquisition rate. GPS locations, along with temperature and activity information, will be stored in the unit's on-board memory. Other captured bears, including black bears, will be processed, marked with ear tags, and then released.

Each collar will be equipped with a standard VHF transmitter, so they can be located by traditional radiotelemetry. Also, collars will be equipped with a timed, self-release mechanism. The collars will be set to self-release 12-18 months after deployment. Within a few days after a scheduled release, we will locate each collar using fixed-winged aircraft to determine its location. Once a collar has released, we will use a helicopter or airplane to retrieve the collar. In the office, we will download the stored GPS fix locations on a PC computer using Telonics software. Home range areas will be determined for each bear using minimum convex polygon and fixed kernel methods available in the GIS. Probability utilization distributions will be calculated for each bear using fixed kernel methods (Millspaugh et al. 2006). A resource selection analysis model (RSA; Manly et al. 2002) will be constructed for each sex by season with habitat and physiographic features as explanatory variables.

For all captures, samples of ear tissue resulting from the insertion of the ear tag will be collected for DNA analysis. Also, hair samples with intact roots will be collected. The tissue samples will be placed in 95% ethanol for storage. Hair specimens will be air dried, placed in a paper envelope, and then stored in a dry environment. Additional DNA samples will be collected from the population of bears by placing hair traps along salmon-spawning streams and beach areas. Each hair trap will consist of a modified neck snare with 3 lengths of barbed wire attached to the snare cable. At the end of the season, the hair samples along with tissue samples collected from live-captured and hunter-killed

bears will sent to a commercial genetics laboratory (Wildlife Genetics International Lab, Nelson, BC; WGI) for individual bear identification using DNA microsatellite markers. Harvest rate will be estimated using a closed population model in Program MARK. The live-capture and hair-snare samples will be our marked sample and hunter-harvested bears our recaptures.

III. MANAGEMENT IMPLICATIONS

None yet.

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

JOB/ACTIVITY 1: Capture bears, deploy GPS radiocollars

Accomplishments: We captured 12 brown bears in Unit 5B and deployed 10 GPS collars on them. In Unit 5A, we caught and deployed GIS collars on 11 brown bears.

JOB/ACTIVITY 2: Collect DNA samples

Accomplishments: We collected DNA from the live-trapped brown bears (22).

V. PUBLICATIONS

None.

VI. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

None.

VII. RECOMMENDATIONS FOR THIS PROJECT

We are ready for 2nd year of field work.

Literature Cited

Flynn, R.W., S.B. Lewis, L. Beier, and G. Pendleton. 2006. Abundance, spatial relationships, and transboundary movements of brown bears on the Mainland Coast of Southeast Alaska. Unpublished progress report. Division of Wildlife Conservation, Alaska Department of Fish and Game, Douglas.

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Millspaugh, J.J., R.M. Nielson, L. McDonald, J.M. Marzluff, R.A. Gitzen, C.D. Rittenhouse, M.W. Hubbard, and S.L. Sheriff. 2006. Analysis of resource selection using utilization distributions. Journal of Wildlife Management 70:384–395.

Schoen, J.W. and L.R. Beier. 1990. Brown bear habitat preferences and brown bear logging and mining relationships in Southeast Alaska. Final Report. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration Project W-22-1, Study 4.22. Juneau.

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