FEDERAL AID ANNUAL RESEARCH PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

PROJECT TITLE: Kenai Peninsula brown bear population demographics

PRINCIPAL INVESTIGATOR: Sean Farley

FEDERAL AID GRANT PROGRAM: Wildlife Restoration

GRANT AND SEGMENT NO. W-33

PROJECT NO. 4.38

WORK LOCATION: Kenai Peninsula

STATE: Alaska

PERIOD: July 1, 2010 – June 30, 2011

I. PROGRESS ON PROJECT OBJECTIVES SINCE PROJECT INCEPTION

OBJECTIVE 1: Determine the finite rate of change (lambda) for the Kenai brown bear population.

Job/activity: collect demographic data

Data will be collected by collaring a subset of peninsula bears with vhf radio collars and following them for several years to collect data cub production, litter size, cub survival, adult survival, age of weaning, estimated age of first reproduction (where possible), inter birth interval, and annual natural mortality rate.

OBJECTIVE 2: Complete data analysis on differential reproductive fitness of Kenai brown bears.

Job/activity: data analysis

Collaborate with Dr. Sandy Talbot of the USGS Molecular Ecology laboratory in Anchorage, Alaska to look for individual maternal lineages of Kenai Peninsula brown bears. The data to be used will include recent genotypes determined for Jackson et al. (in press) as well as any additional bears handled. Where possible, perform a genealogical reconstruction of maternal lineages for the past 10 years. Relate that information with reproductive success from past radio-collared work.

OBJECTIVE 3: Develop a model predicting demographic vigor of Kenai Peninsula brown bears.

Job/activity: model development

Explore analysis of data from jobs 1 and 2 to construct predictive model(s) combining biological covariates (genetic relatedness, differential reproductive fitness, demographic data) of Kenai brown bears.

Objective 4: Attend conferences and training, write and present papers.

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

OBJECTIVE 1: JOB/ACTIVITY __1: There are 46 collars being monitored, of which 7 are potential drops, leaving 39 bears known alive. Figure 1 indicates fall 2001 locations for all bear collars under review.

JOB/ACTIVITY _2_: Animal Captures… Fall 2010 captures were not fruitful as only 4 animals were captured (3 adult females; 1 sub-adult male). During spring of 2011 eight animals were captured (5 adult females; 3 sub-adult males). Figure 1 shows most recent geographic distribution of bears.

JOB/ACTIVITY _3_: Data Analysis….Demographic data has been updated with deaths, re-captures, and productivity information through August 2011. Age of new bears has not been returned from the lab as of fall 2011.

1) Annual Female survivorship has been calculated for the duration of the project (see Fig. 2)

2) Mean age of reproduction for the duration of the study (through 2010) has been calculated to be 11yr (sd 4) with a range of 3-23 years

3) Annual cub survival and litter size has been calculated for the duration of the project (see Tables 1 & 2).

4) Parameters from Tables 1 and 2 and Figure 2 were applied to a population model based upon Eberhardt and Siniff (1977). The age of first parturition was assigned 5 years with a range of 4 to 7. Mean annual birth rate was calculated from female cubs per female (assuming 50:50 ratio). An interbirth interval of 3.08 (3.05 to 3.17) was calculated from demographic data. Lambda was calculated to be 1.0394 with upper and lower bounds of 1.0432 and 1.0356, respectively.

OBJECTIVE 2: JOB/ACTIVITY_1: Genotypes, spanning 1995-2010, have been determined for approximately 220 Kenai brown bears. The individual reproductive fitness for each bear will be determined from telemetry data and used in Objective 3.

OBJECTIVE 3: JOB/ACTIVITY: No work was done on this job during the year.

Objective 4: Job/Activity: No work was done on this segment.

III. APPENDIX.

PREPARED BY:

Sean Farley
Wildlife Physiologist II

SUBMITTED BY:

Type coordinator name
Research Coordinator

APPROVED BY:

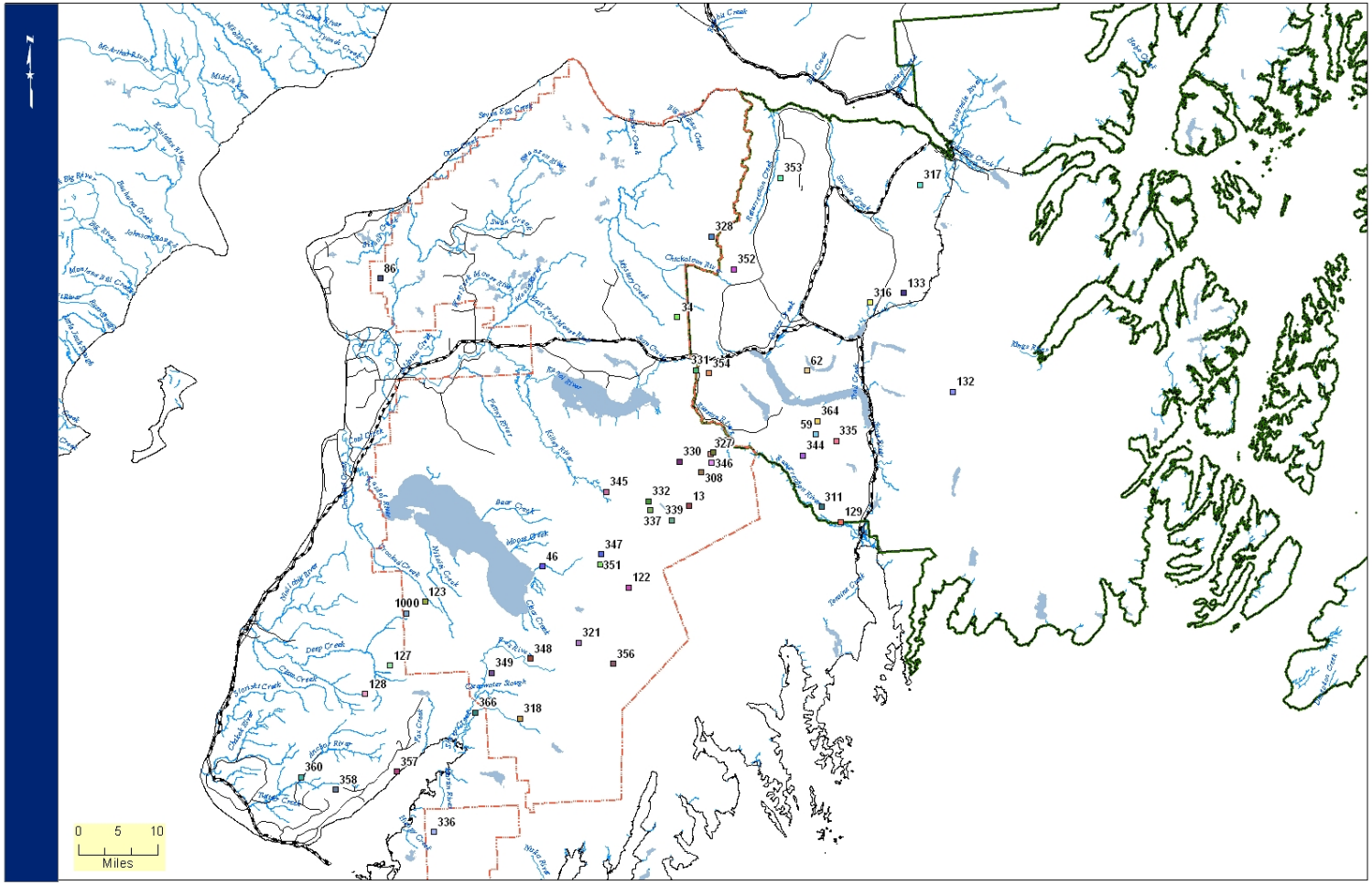
_____

Federal Assistance Coordinator
Division of Wildlife Conservation

_____
, Director
Division of Wildlife Conservation

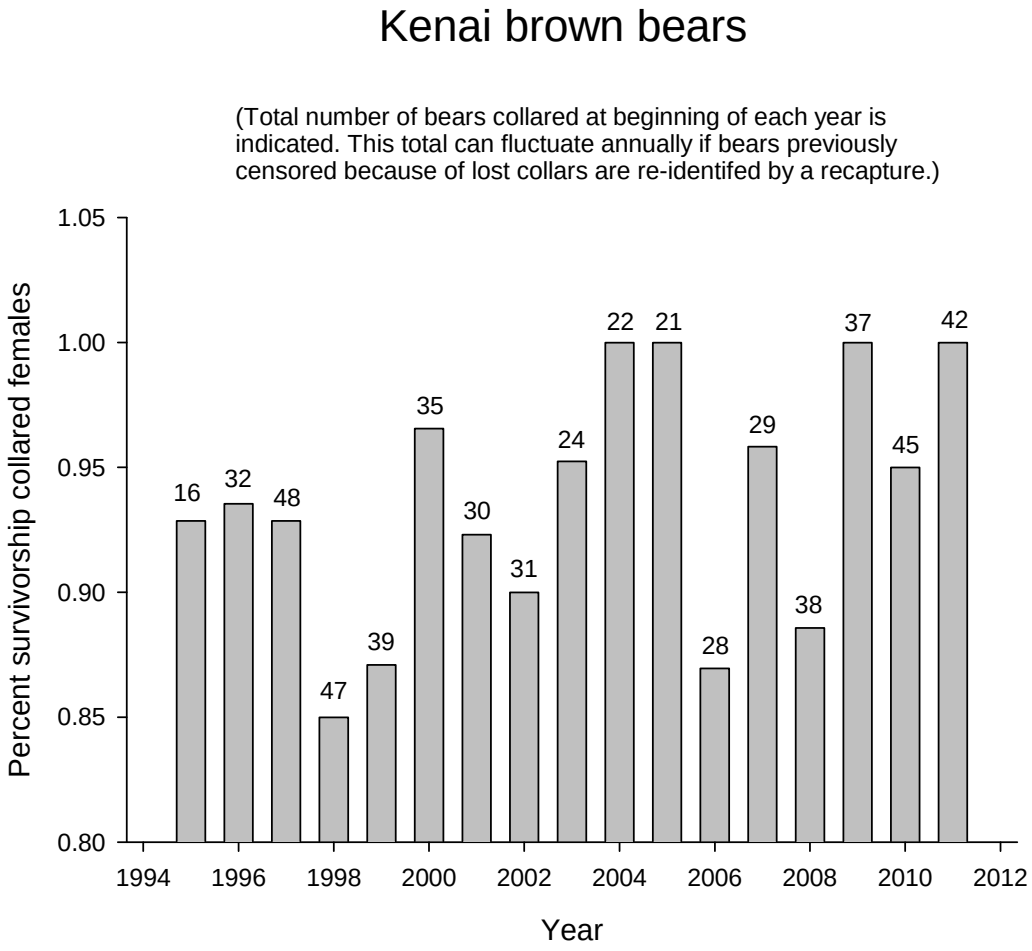
Approval Date: _____

Figure 1. Most recent (fall 2011) collared animals.



ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Figure 2



Tables 1 & 2: Cub survivorship and litter size for Kenai Peninsula brown bears.

Number of Cubs by Fate and Age to 2011

	Age of Cubs					
	0	1	2	3	Grand Total	
Sum of Survived	201	136	127	12	476	
Sum of Lost	96	65	1	0	162	
Sum of Censor	7	1	3	0	11	
Sum of Unknown	36	17	0	0	53	
Total	340	219	131	12	702	
Maximum Survival	0.68	0.68	0.99	1.00	To Weaning	0.46
Minimum Survival	0.60	0.62	0.99	1.00		0.38

Assumes Lost Cubs Died

Assumes Lost and Unknov Died

Number of Litters by Litter Size and Age of Cubs to 2010

	Age of Cubs				
Litter Size	0	1	2	3	Grand Total
1	29	26	17	1	73
2	73	53	30	4	160
3	51	29	18	1	99
4	3	0	0	0	3
Grand Total	156	108	65	6	335
Mean Litter Size	2.18	2.03	2.02	2.00	