

**FEDERAL AID COORDINATION & SUPPORT
ANNUAL 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: AKW-10 Wildlife Restoration FY2017
Project Number: 26.0
Project Title: Biometric support for research and management programs
Project Duration: July 1, 2016 – June 30, 2017
Report Due Date: September 28, 2017

PRINCIPAL INVESTIGATOR: Grey W. Pendleton (HQ), Jason Waite (RI), Earl Becker (RII), Alyssa Crawford & John Merickel (RIII), Michael Guttery & Meg Inokuma (RIV), and Adam Craig (RV)

WORK LOCATION: Statewide

All Regions

I. PROGRESS ON PROJECT OBJECTIVES DURING LAST SEGMENT

OBJECTIVE 1: Biometric consulting. Provide biometric assistance to research and management staff. In addition, the biometricians will review and evaluate biometric aspects of future research study proposals.

OBJECTIVE 2: Attend conferences and training, and present findings.

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

No.

V. RECOMMENDATIONS FOR THIS PROJECT

This project should be continued as described in the study plan.

Headquarters Report

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

Job/Activity 1: Provide biometric consulting.

1. Estimate the population size of nesting dusky Canada geese on Middleton Island, Alaska. I worked with Waterfowl Program staff to further refine the design for estimating the number of dusky Canada goose nests on Middleton Island. I also participated in 1 week of field sampling (May 2017). I produced preliminary estimates of the number of goose nests on the island (and associated precision estimates) for 2015 and 2016.
2. Abundance of mallards in urban Anchorage, Alaska. I consulted with Waterfowl Program staff and examined existing data. Developed preliminary mark-resight models for estimating population sizes, survival, and movement probabilities. Participated in field data collection to better understand requirements for analyses. Data collection continues.

Job/Activity 2: Attend conferences and training, and present findings.

Meetings: Attended the Alaska Bird Conference (Dec. 2016) and presented a poster titled *Estimating the Number of Dusky Canada Goose Nests on Middleton Island 2015-2016*.

Training: A request to attend training (Bayesian Integrated Population Modeling) for application to the emperor goose population model was not approved.

IV. PUBLICATIONS

None

Prepared by: Grey Pendleton

Date: 31 August 2017

Region I

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

Job/Activity 1: Provide biometric consulting

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1. DNA-based population estimation for GMU 1A (Gravina) and GMU 3 (Mitkof/Kupreanof) deer.
2. DNA-based population estimation for GMU 2 (Prince of Wales) wolves. I continued analysis and produced population estimates for the 2015-2016 season. I worked with research and management staff on the project design for the 2016-17 field season. I continued development of advanced wolf-specific models intended to provide more precise population estimates.
3. DNA-based population estimation for GMU 5A (Yakutat brown bears). I finalized analysis on the Yakutat brown bear population estimate and worked with research staff to prepare a Final Wildlife Research Report for this project.
4. Development of an aerial sightability model for population estimation of mountain goats in GMU 1A-B. I worked with research staff and biometricians to finalize development of the Bayesian sightability model that incorporates survey-level and group-level covariates to estimate population levels at various special scales. I worked with research staff to prepare a Final Wildlife Research Report for this project.

Job/Activity 2-: Attend conferences, training, write and present papers

I was selected for and attended a short course on Bayesian Hierarchical Modeling in Fort Collins, CO, presented by Mevin Hooten and Thomas Hobbs. I attended the Regional Meeting for Region I and participated in the Deer S&I workshop where I presented previous findings on deer browse and forb utilization on Mitkof and Kupreanof Islands, and discussed and made recommendations on future data collection strategies. I participated in deer pellet surveys to evaluate the adequacy and effectiveness of current data collection methods with respect to current and future management needs. Finalized two research reports on brown bear population estimation and mountain goat aerial survey population estimation techniques (see section IV. Publications below).

IV. PUBLICATIONS

Crupi, A. P., J. N. Waite, R. W. Flynn, and L. R. Beier. 2017. Brown bear population estimation in Yakutat, Southeast Alaska. Alaska Department of Fish and Game, Final Wildlife Research Report ADF&G/DWC/WRR-2017-1, Juneau.

White, K. S., G. W. Pendleton, and J. N. Waite. 2016. Development of an aerial survey population estimate technique for mountain goats in Alaska. Alaska Department of Fish and Game, Final Wildlife Research Report ADF&G/DWC/WRR-2016-9, Juneau.

Prepared by: Jason Waite

Date: 31 August 2017

Region II

II. PROGRESS ON PROJECT OBJECTIVES DURING LAST SEGMENT

Job/Activity 1: Provide biometric consulting to ensure the highest possible quantitative standards are applied to the Division's wildlife management and research activities.

1. Performed moose survival analysis. Performed an exploratory data analysis of vaginal implant transmitter (VIT) moose data.
2. Consulted on sampling deer browse in rainforest habitats of Prince William Sound.
3. Developed an unbiased distance sampling model to estimate bear population size. I did a major rewrite of the variance calculations for my bear MRDS model that utilizes a two-piece normal detection function. I analyzed the GMU 9D and 10 bear surveys and did additional analyses to see if they could be jointly model to reduce the variance. Strata variance calculations have not been implemented as of this data.

Job/Activity 2: Attend conferences, training, write and present papers.

I have written drafts of 2 distance sampling papers. I also attended a short course and a work group meeting on using and implementing Close-Kin Mark Recapture (CKMR) to estimate animal population sizes.

IV. PUBLICATIONS

None

Prepared by: Earl Becker

Date: 31 August 2017

Region III

II. PROGRESS ON PROJECT OBJECTIVES DURING LAST SEGMENT

Job/Activity 1: Provide biometric consulting to ensure the highest possible quantitative standards are applied to the Division's wildlife management and research activities.

1. Both the Region III biometricians reviewed and performed statistical analyses, assisted in study design, and provided statistical editing in support of numerous federal aid projects.
2. Estimating demographics of Fortymile and Central Arctic caribou herds: Continued updating trends and analyses of calf survival, adult survival, parturition rates, newborn calf mass, and October calf mass for area biologist Beth Lenart and caribou biologists Torsten Bentzen.

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3. Caribou photocensus research: Preliminary development of new techniques for herd size and the new aerial digital camera system including automated counting and sampling techniques.

4. Marten population status project: Continued analyses of marten harvest including predicting next season's harvest and estimating thresholds of overharvest with furbearer Kerry Nicholson and retired ADF&G furbearer biologist Craig Gardner.

5. Bison pen trial evaluation: Completed analyses of wood bison responses to calming drug during pen trials for wildlife epidemiologist Jack Mortenson and biologist Darren Bruning.

6. Evaluation of Intensive Management Programs Statewide: Consulted with Tom Paragi, Jen Roach, and Rob DeLong on data structuring and management for analyses of data relating to IM programs across the state. This will be an ongoing project for approximately the next year.

7. Method Development and Evaluation: Wrote a research operational plan and submitted a proposal for a federal aid project to develop Close Kin Mark Recapture (CKMR) techniques for wildlife population abundance and vital rate parameter estimation. This federal aid project is still pending funding.

8. Harvest Rate Estimation: Assisted Fairbanks AB in estimating harvest rates and trends for historical 20A moose harvest data.

9. Survey and Inventory Work:

- Designed and analyzed moose surveys in GMUs 19A, 20B, 12, and 20E.
- Consulted with biologists about potential population abundance estimation and vital rate parameter estimation for various species.
- Analyzed caribou herd size for the Central Arctic, and Fortymile caribou herds.
- Consulted on reports for moose operational planning.

10. Field Work:

- Participated in Ptarmigan captures with our small game program.
- Assisted moose research biologist with moose parturition surveys.
- Assisted with caribou photocensus of Central Arctic, Porcupine, and Fortymile caribou herds.
- Assisted with Koyukuk moose check station.

Job/Activity 1: Attend conferences and training, and present findings.

- John Merickel and Alyssa Crawford attended the ASA annual 3 day meetings and workshop on Bayesian data analysis using program STAN.
- John Merickel completed a course from University of Alaska Fairbanks titled "Vertebrate Population Dynamics".
- Alyssa Crawford completed a course from University of Alaska Fairbanks titled

“Statistical Computing”.

Alyssa Crawford completed Bayesian Integrated Population Models workshop

IV. PUBLICATIONS

None

Prepared by: John Merickel & Alyssa Crawford

Date: 31 August 2017

Region IV

I. PROGRESS ON PROJECT OBJECTIVES DURING LAST SEGMENT

OBJECTIVE 1: Biometric consulting.

During the reporting period, the biometrician position for Region IV was minimally staffed with Guttery serving as the acting or official Regional Research Coordinator since January 2016 and Inokuma not assuming the position until May 2017.

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

Job/Activity 1: Provide biometric consulting.

1. Brown Bear Vital Rates

Guttery finalized an analysis of brown bear vital rates and population growth. This analysis involved development of a Bayesian multi-state mark-resight model to estimate stage-specific apparent survival, stage transitions, cause-specific mortality and population growth rate. The analysis and results are currently being written up for submission to a peer-reviewed journal.

2. Moose Resource Selection Function

Guttery provided consultation and analytical assistance to biologists working on sex and season-specific resource selection function analyses. Results of this work are included in reports for the Susitna-Watana hydroelectric dam moose report and are being updated for submission to a peer-reviewed journal.

3. Moose Browse Removal Analysis

Guttery provided analytical assistance to research and management biologists working with multiple moose browse data sets. Results of these analyses are included in reports for the Susitna-Watana hydroelectric dam moose report and are being used to inform moose management.

4. Upland Game Surveys

Guttery assisted the small game program (Merizon and Carroll) with developing methods to survey grouse and ptarmigan. These methods are being used to monitor upland game abundance and chick production.

5. Male Caribou Survival and Growth Analysis

Inokuma provided analytical assistance to research biologists working on the male caribou survival and growth data set.

6. Togiak GSPE Review

Inokuma reviewed the results of GSPE conducted by USFWS in March 2017 and provided feedback to research biologists.

Job/Activity 2: Attend conferences and training, and present findings.

Guttery attended the meeting of the Alaska Chapter of The Wildlife Society and a workshop on Integrated Population Models.

IV. PUBLICATIONS

None

Prepared by: Michael R. Guttery and Meg Inokuma

Date: 31 August 2017

Region V

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

Job/Activity 1: Provide biometric consulting.

1. Assisted ADF&G Area Manager Tony Gorn (Region V-Nome) and biologist Bill Dunker (Region V-Nome) in designing geospatial population estimator (GSPE) moose surveys in Units 22B and 22C. Assisted with preparing a memorandum documenting the survey.
2. Assisted ADF&G Area Manager Brandon Saito (Region V-Kotzebue) in designing composition surveys for muskox in Cape Krusenstern National Monument and Noatak National Preserve. Assisted with preparing a memorandum documenting the survey.
3. Assisted ADF&G Assistant Area Manager Brandon Saito (Region V-Kotzebue) in designing a GSPE moose survey for the Selawik Wildlife Refuge survey area.
4. Assisted ADF&G caribou biologists Jim Dau (Region V-Kotzebue) and Lincoln Parrett (Region V-Fairbanks) in estimating and predicting caribou harvest for both the Western Arctic and Teshekpuk caribou herds.

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5. Assisted ADF&G caribou biologist Lincoln Parrett (Region V-Fairbanks) with the analysis of caribou calf survival with regards to winter range.
6. Assisted Region V biological staff complete photographic survey to estimate abundance of Western Arctic caribou herd.

Job/Activity 2: Attend conferences and training, and present findings.

None

III. PUBLICATIONS

Spatiotemporal patterns in calf survival in the Teshekpuk Caribou Herd. Final Grant Report (BLM-AK-NOI-L10AS00211; Grant#L10AC20353).

Prepared by: Adam Craig

Date: 31 August 2017