

Wildlife Restoration OPERATING GRANT FINAL 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-B-R3-2020

PROJECT NUMBER: P36.0

PROJECT TITLE: Evaluation of intensive management programs in Alaska during harvest regulatory years 2003-2016

PERIOD OF PERFORMANCE: July 1, 2019 - June 30, 2021

PERFORMANCE YEAR: July 1, 2020 - June 30, 2021; year 2 of a 2-year grant

REPORT DUE DATE:

PRINCIPAL INVESTIGATOR: Thomas F. Paragi, Wildlife Biologist IV, ADF&G

COOPERATORS: Adam Craig, Graham Frye, John Merickel, Jen Roach, John Skinner

I. PROGRESS ON PROJECT OBJECTIVES DURING PERFORMANCE YEAR

For all objectives the data analysis was extended through regulatory year 2018.

OBJECTIVE 1: Describe time series of biological, environmental (e.g., weather, fire, habitat), and harvest parameters of prey and predators for each Intensive Management (IM) program using available data from when the first abundance estimates were reported in consistent presentation formats that incorporate estimates of variance when sampling occurred.

ACCOMPLISHMENTS: Completed.

OBJECTIVE (2): Where results from Objective 1 are sufficient, estimate trend in parameters (e.g., abundance, recruitment indexed from calves per cow) for those years available before and after implementation of IM for each IM program to discern whether trends changed in the intended or forecasted direction following implementation.

ACCOMPLISHMENTS: Completed. Trend analysis was done for abundance and harvest; other parameters were plotted as estimates (including variance for proportion calves) as context. The time series for moose abundance and harvest was also compiled at the scale of large prescribed burns and of selected large wildland fires near the road system to discern response magnitude.

OBJECTIVE (3): Describe reported harvest of caribou and moose and reported take of black bears, brown bears, and wolves statewide by game management unit (GMU) as a context for

FPR A#1 AKW-B-R3-2020 P36.0 Evaluation of intensive management programs in Alaska during harvest regulatory years 2003-2016

interpreting caribou and moose harvest and trends statewide and gauging relative contribution from IM programs.

ACCOMPLISHMENTS: Completed.

OBJECTIVE (4) Estimate caribou and moose hunting effort and kill per unit effort from GMUs along the road and ferry system to discern spatial shifts before and during IM programs and the effects of regulatory changes on harvest.

ACCOMPLISHMENTS: Completed. In the prior reporting period, Paragi drafted a coding structure that was reviewed by experienced managers to gauge the plausible effect strength of hunting regulations (hunting opportunity) on moose harvest parameters as an input to a harvest model. Coding was judged to be subjective (not objectively reproducible), so modeling proceeded without it. Subsequently he compiled the number of different state permit types (community, drawing, registration, Tier), state harvest tickets, and federal subsistence permits for caribou and moose IM programs. Stacked bar plots illustrate how magnitude and type of harvest opportunity changed over time for comparison to prey abundance (harvestable surplus) and the corresponding amount of harvest subsequently achieved.

Beyond the empirical estimates of kill per unit effort (inverse of days to kill), we assembled biological, environmental, and harvest data in a consistent spatial resolution for exploratory post hoc modeling for strength of factor relationships among parameters. Our interest was factor relationships plausibly related to moose abundance in IM program and non-treatment comparison areas (2003-2018) and to moose harvest statewide (1983-2018; hunter success and days hunted). Skinner performed the analysis using generalized additive mixed models that do not require specified parametric relationships between explanatory variables and outcomes of interest. The modeling approaches were documented in preliminary reports. None of the modeling attempts produced strong candidate models that would indicate which post hoc factor relationships were strongest. Likely explanations for this outcome are that our data did not include important explanatory factors (e.g., hunting opportunity for harvest) or because of factor confounding. An example of confounding would be when the management action (e.g., attempted reduction of ≥ 1 predator species) occurred simultaneously with stochastic environmental events that may affect prey fitness, such as wildland fire improving prey habitat or mild winters improving prey survival.

OBJECTIVE (5) Describe a time series for each IM program that includes S&I and IM costs and staff time.

ACCOMPLISHMENTS: Completed.

OBJECTIVE (6) Approximate the marginal cost of harvested caribou and moose produced in IM programs within the resolution of cost data and necessary qualifications of accounting and economic principles.

FPR A#1 AKW-B-R3-2020 P36.0 Evaluation of intensive management programs in Alaska during harvest regulatory years 2003-2016

ACCOMPLISHMENTS: We were unable to complete because cost accounting methods to discern among categories and the accounting databases and query systems have changed over time.

OBJECTIVE (7) Summarize each program in a standard format of historic conditions prior to IM implementation, starting conditions (goals, objectives, and forecasted trends) at IM implementation, regulatory changes, decision frameworks to implement or suspend activities, data time series, unique design situations that qualify inference on outputs, and program parameters as of 30 June 2016.

ACCOMPLISHMENTS: Case study details were compiled through 2018 to accompany the data and will be reviewed by area biologists with program area jurisdiction as bulletin writing continues.

OBJECTIVE (8) Synthesize findings and provide recommendations to better inform future decisions to implement, suspend, or terminate IM programs and to design monitoring strategies through S&I and research projects.

ACCOMPLISHMENTS: Paragi has briefed affected staff based on analysis findings and answered questions that arose on planning, operations, regulations, and policy. Findings will be incorporated in the technical bulletin and in internal protocol recommendations.

OBJECTIVE (9) Update an earlier comparison of red meat inputs to Alaska from big game, Alaska-grown meat, and imported meat to provide context for food security.

ACCOMPLISHMENTS: Completed.

OBJECTIVE (10) Update the IM literature review on the ADF&G website.

ACCOMPLISHMENTS: Not yet completed.

OBJECTIVE (11) Produce a DWC wildlife technical bulletin to serve as the primary deliverable, a concise summary of the technical bulletin for a lay audience, and a concise financial summary for legislators and decision makers.

ACCOMPLISHMENTS: Paragi began drafting outlines for a bulletin on IM case studies and statewide trends in moose harvest and a bulletin on harvest trends in large predators.

II. SUMMARY OF WORK COMPLETED ON PROJECT TO DATE

Data compilation and exploratory analyses to understand data properties have been completed with several files posted on an internal server as a staff resource. Case study compilations of data trends were drafted for area biologist review. We updated a comparison of red meat inputs to Alaska from big game, Alaska-grown meat, and imported meat during 2000-2016 to provide context for contribution of the wild food supply. We also estimated per capita harvest for moose statewide and tested algorithms to generate annual maps of moose harvest from the perspective of communities (showing GMUs where harvest by a community occurred) or from the perspective of subunits (amount of harvest by community from a GMU). However, because of

the post hoc nature of the analysis (lacking pre-treatment study design prior to implementation), we cannot objectively discern cause of observed changes in harvest spatial pattern at the statewide or regional scale that can be directly attributable to implementing IM.

Despite the shortcomings of post hoc analysis where data trends and factor relationship strength cannot objectively demonstrate causation, this research project has nonetheless collated biological, environmental, and harvest data on moose and caribou herds under Intensive Management, and on statewide harvest trends of moose and large predators. The data describe the historic context for decision points to implement or suspend predator control once programs were authorized, the general status of predator and prey populations over time, and program efficacy in achieving IM objectives. These factors may be of interest to the public and Alaska Board of Game in discussions during the regulatory process or for policy analysis.

The collated data provide the basis for continued evaluation of IM program efficacy. The lack of establishing causation (i.e., presence of factor confounding) limits the usefulness of these post hoc findings for treatment design in new programs or for modifying implementation design in existing IM programs being considered for renewed authorization. However, the observed relationships and archived data may aid hypothesis testing in future programs where designed studies can be implemented to discern causation or evaluate statistical power of decision frameworks.

In this reporting period Paragi gave 4 webinars on data summaries and preliminary analyses to staff (3 for staff in affected program areas in Regions 2, 3 and 4; 1 for select group of research staff on attempted modeling) for feedback and to identify additional research questions or data limitations. Paragi verified a public request for predator kill information and outcomes of IM programs and was interviewed by KUAC-FM (Fairbanks) for a follow-up story on the news release by the person who made the information request. He also produced a brief table of IM program outcomes for prey abundance and harvest related to predator treatments applied.

III. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

None.

IV. PUBLICATIONS

Paragi and Frye completed a report “Estimated moose harvest per capita among regions of Alaska during 1990-2018” now posted on the Division of Subsistence website¹ that will host the data set once the web platform is upgraded. They also assisted other DWC staff in preparing a commentary article for a professional journal, using the example of predator management, on

¹https://www.adfg.alaska.gov/static/home/subsistence/pdfs/Paragi_Frye_2020_per_capita_moose_harvest_among_regions_of_Alaska_1990-2018.pdf

how personal values of researchers can become conflated with scientific evidence, potentially leading to biased conclusions and public distrust of scientists.

V. RECOMMENDATIONS FOR THIS PROJECT

We extended the project a 3rd year primarily for writing. When writing is in the final stages after staff review, we will begin updating the website research list (Objective 10). After any data questions from the reviews are resolved, we will archive final data sets and analysis results.

Topic outlines have been drafted for 2 technical bulletins (IM program outcomes and predator take patterns), each with multiple chapters and appendices to complement the data archive. Outlines are being drafted for scientific presentations on moose and caribou program responses and trends in predator take. Presentations will be developed with collaborators in the next reporting period to receive external feedback on our findings and interpretations with the intent of generating peer reviewed publications in addition to the bulletins. Preparation of the technical bulletins will continue along with staff consultation on outreach messages and presentation formats.

Prepared by: Thomas F. Paragi

Date: 12 August 2021