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: AKW-4 Wildlife Restoration FY2015

PROJECT NUMBER: 7.01

PROJECT TITLE: Develop and evaluate indices for assessing marten population status and trend in Interior Alaska

PROJECT DURATION: 1 July 2010–30 June 2016

REPORT DUE DATE: 1 September 2015

PARTNER: None

PRINCIPAL INVESTIGATORS: Kerry L. Nicholson and Craig L. Gardner (retired), ADF&G; Co-investigator: Nathan J. Pamperin, ADF&G

COOPERATOR: Knut Kielland (University of Alaska Fairbanks)

WORK LOCATION: Game Management Units 12, 19D, 20, 25B, and 25C

I. SUMMARY OF WORK COMPLETED THIS SEGMENT ON JOBS IDENTIFIED IN ANNUAL WORK PLAN

OBJECTIVE 1: Evaluate if fecundity based on pregnancy rates and blastocyst counts can be used as indicators of marten population status and composition for subsequent trapping season(s).

JOB/ACTIVITY 1A: Collect carcasses from the same trappers from the same areas and evaluate the YOY:AdF ratios relative to the previous year's blastocyst counts and pregnancy rate. If there are no relationships, these data will indicate that either our methods of assessing pregnancy (presence of blastocysts) or counting blastocysts are not adequate or that YOY survival was lower than expected during the period between birth and the onset of trapping season.

During FY15 we necropsied 1,370 marten carcasses collected from 39 different trappers. In comparison, during FY11, FY12, and FY13, we necropsied 308, 1,183, 802, and 1,353 marten carcasses, respectively. Five trappers from 4 areas contributed to the FY11 sample; 17 trappers from 9 areas the FY12 sample; and 11 trappers from 8 areas, the FY13 sample, 26 trappers from 14 areas to the FY14 sample. During all years, for each carcass, we determined gender:age class (adult or young of year [YOY] based on skull characteristics); pregnancy by the presence of blastocysts in the uterine horns; and

collected muscle, hair, and claw samples to determine seasonal diets using stable isotope analyses. We also extracted a lower fourth premolar from adults for more exact age determination using cementum annuli. During FY15 we collected a premolar from 155 females and 385 males females for aging. Stable isotope analyses were conducted by our cooperator Knut Kielland and associates at the University of Alaska Fairbanks. We limited these analyses to adult females during FY10–FY14 to evaluate possible relationships between dietary choice and pregnancy. In FY15 we incorporated other sex and age classes for further possible exploration (73 juvenile females; 70 juvenile male; 164 adult females; 85 adult males) During FY12 (trapping year 2011–2012) we identified a reproductive failure that occurred across the Interior. We used this year as the benchmark for all comparisons.

Preliminary analyses of data collected in FY15 closely agreed with previous years' findings that the best forecast variable for predicting a given year's marten abundance and population composition is pregnancy rate in the previous year. However, there can be disconnects between pregnancy and juvenile presence in the harvest due to both poor (fewer than expected) and excellent juvenile survival during spring and summer. The best in-season check of the forecast appears to be percentage of adult males in the harvest. Since adult males are vulnerable to harvest throughout the season and juveniles are most vulnerable early on, early season harvest composition of ≥40% adult males indicates poor productivity. Further, even during years of average to high juvenile numbers, the percentage of adult males can be used to monitor the composition of status of the harvested population. As the season progresses, once the percentage of adult males increases to ≥40% one can assume that few juveniles remain. This information is advantageous to managers monitoring marten population trends and useful to trappers in managing their lines (i.e., knowing when to stop trapping based on catch ratios of young-of-year (YOY) and possibly adult males to minimize capture of adult females). We are conducting additional analyses to determine if there are other factors that can be easily used by managers to develop a more accurate forecast of marten numbers in a given trapping season.

OBJECTIVE 2: Test the hypothesis that total YOY:AdF ratios of >3:1 are adequate for marten population maintenance.

JOB ACTIVITY 2A: Compare sex and age ratios and total catch between years by trapper (trapper effort will remain comparable throughout the study).

Federal funds were used to pay salaries associated with collecting and necropsying marten carcasses. During FY15, 1,370 marten carcasses collected from 39 trappers in Interior Alaska were necropsied. Trapper interest in the project is increasing across the Interior. Overall, the YOY/AdF ratio was 4.28. We have yet to receive tooth age analysis. However, pregnancy rate for adult females was 37%, the average number of blastocysts/pregnant female was 0.93, percent adult male in the harvest was 32.07%. The YOY/AdF ratio was higher than the recommended minimum of 3.0 YOY/Ad (Strickland and Douglas 1987) and the < 40% harvest of adult males indicates that juvenile survival prior to the trapping season was good. The average pregnancy rate indicates that marten numbers across the Interior may not increase next year and summer survival may be critical.

OBJECTIVE 3: Assess how marten reproductive performance is related to diet and age by study area.

JOB/ACTIVITY 3A: Annual collections contain carcasses from all marten caught by trappers. We will necropsy all carcasses to identify gender and age classes, estimate fecundity, and collect muscle, hair, and claw samples to examine diets by sex and age using stable isotope techniques.

Skinned marten carcasses were collected from 5–7 trappers in 3 study areas across the Interior during RY10–RY13. We collected 300–800 carcasses per year including 100 from each study area. Furthermore, we have collected samples (≥1,500 marten) during RY07–RY09 from the 3 areas.

A premolar from the harvested females ≥1-year-old will be collected to determine age structure of the harvest. Federal funds were used to pay for salary associated with extracting and preparing teeth for aging. Tooth samples will be sent to Matson's Laboratory, LLC (Milltown, Montana) for aging. We received ages from 510 harvested females ≥1-year-old from FY12 and FY13 from the laboratory. The average age was 3.1 years old and the oldest female caught was 12 years old (n = 2). In FY15 we added another 155 female samples to this data set but have yet to receive the ages.

Muscle, claw, and hair samples from each of the 214 harvested females ≥1-year-old were collected for stable isotope analyses to determine seasonal diets for FY13 and an additional 164 in FY15. During these fiscal years, only claw samples were analyzed but summary reports were not completed by the time of writing this report. Federal funds were used to pay for salary associated with this task and for the contracted work by the University of Alaska laboratory to conduct stable isotope analyses.

Preliminary comparison of diet between years indicate that during the year of low productivity (FY12) marten diets were dominated by squirrels when compared to more productive years (FY08 and FY10) when voles dominated the diet. Marten are dietary generalists but population declines have been documented following synchronous declines of rodents (Thompson and Colgan 1987, Flynn and Schumacher 2009). We will continue to evaluate diet for all sample areas over all of the sample years. We will be sampling small mammal and other diet items of marten develop the baseline catalogue of isotopic signatures to properly evaluate marten isotopic signatures.

OBJECTIVE 4: If funding becomes available or if outside ADF&G cooperators become interested, assess the value of small mammal abundance indices as predictors for marten population status.

JOB/ACTIVITY 4A: Assess the status of small mammal populations during August–October and possibly during the spring in areas where carcasses are being collected. Accumulate at least 600 trap nights (museum special snap traps) in a variety of available habitats in each study area to evaluate abundance of small mammals. Assess snowshoe hare abundance following techniques used by the University of Alaska Fairbanks (Knut Kielland, unpublished data). We will test if small mammal abundance can be used to predict marten population trend and productivity.

No work was accomplished on this objective during the report period.

OBJECTIVE 5: Literature review, data analysis, and publications.

JOB/ACTIVITY 5A: Analyze data and prepare reports and manuscripts.

Federal funds were used to cover salary when conducting literature reviews on a monthly basis. Literature searches were conducted for information on marten population dynamics, productivity, and food habits, and on the use of harvest data to monitor furbearer populations and on stable isotope analyses to monitor dietary choice of carnivores.

We began analyzing the capture data with the intent of preparing a manuscript evaluating the use of easily collected samples from harvested marten to forecast population status by trappers and managers. We will also be analyzing the data to identify any variables trappers and managers can monitor within season to track marten population status. In FY14 summarized our preliminary findings in an article published in the Alaska Trappers Association monthly magazine. We also prepared a report distributed to Interior area biologists and contributing trappers summarizing the FY15 necropsy results. Salary associated with these tasks was funded by federal aid (trapper effort will remain comparable throughout the study).

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

None.

III. PUBLICATIONS

LITERATURE CITED:

Flynn, R. W., and T. V. Schumacher. 2009. Temporal changes in population dynamics of American martens. Journal of Wildlife Management 73(8):1269–1281.

Strickland, M. A., and C. W. Douglas. 1987. Marten. Pages 531–546 [*In*] M. Novak, J A. Baker, M. E. Obbard, and B. Malloch, editors. Wild furbearer management and conservation in North America. Ontario Trappers Association, North Bay, Canada.

Thompson, I. D., and P. W. Colgan. 1987. Numerical responses of martens to a food shortage in northcentral Ontario. Journal of Wildlife Management 51:824–835.

IV. RECOMMENDATIONS FOR THIS PROJECT

None.

PREPARED BY: Kerry L. Nicholson

DATE: 7 August 2015