

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-19

PROJECT NUMBER: 2.0

PROJECT TITLE: Assessing Dall's Sheep Horn Morphometrics as a Management Tool

PERIOD OF PERFORMANCE: July 1, 2018 – June 30, 2019

REPORT DUE DATE: 1 September 2019

PRINCIPAL INVESTIGATOR: Brad Wendling, Wildlife Biologist III

COOPERATORS: Tom Lohuis (R4 Wildlife Biologist IV), Chris Brockman (R4 Wildlife Biologist II), Joe Want (R3 LTNP FWT III).

I. PROGRESS ON PROJECT OBJECTIVES DURING PERIOD OF PERFORMANCE

OBJECTIVE 1: Collect morphometric data from hunter harvested sheep horns.

Job/Activity 1-a: Measure and record horn measurements brought in by hunters when they seal their harvested sheep at DWC offices.

ACCOMPLISHMENTS:

We measured and photographed ~68% of harvested rams in 2018 (540 of 790). For each horn, we quantified age, total horn length, total degree of curl, distance between consecutive annuli, and degree of curl by annulus segments.

OBJECTIVE 2: Analyze sheep horn morphometric data.

Job/Activity 2a: Conduct a comparative analysis of data collected on this project to the ADF&G DWC 1968-1970 horn data set.

ACCOMPLISHMENTS:

We used histograms to plot the age structure of Dall's sheep harvest in Alaska under $\frac{3}{4}$ curl harvest strategy, 1968–1971 and under full curl harvest strategy in 2016 and 2017. We used linear regressions to examine the relationship between Dall's sheep age and degree of horn curl for rams harvested in Alaska under $\frac{3}{4}$ curl harvest strategy, 1968–1971, and under full curl harvest strategy in 2016 and 2017. We used linear regressions to

examine the relationship between Dall's sheep horn length and degree of horn curl for rams harvested in Alaska under $\frac{3}{4}$ curl harvest strategy, 1968–1971, and under full curl harvest strategy in 2016 and 2017. Lastly, we calculated the percentage of Dall's sheep harvested as a function of the number of seasons they were legal to be harvested under $\frac{3}{4}$ curl regulation, 1968–1971, and full curl regulation in 2016 and 2017. The data collected in 2018 is currently being organized and incorporated with the 2016, 2017 and historical data. A rigorous analysis of the data will begin this fall.

Job/Activity 2b: Use horn morphometric data to quantify the relationship between and the relative influence of covariates including winter and summer weather patterns, hunter effort, habitat quality as assessed by NDVI and other remotely sensed habitat variables, and summer survey flight data on horn growth patterns.

Analyses are ongoing.

OBJECTIVE 3: Disseminate project results to hunters.

Job/Activity 3a: Create an annual flier summarizing horn morphometric data by mountain range to be distributed to all sheep hunters after each hunting season.

ACCOMPLISHMENTS:

A Dall's sheep newsletter, which included a summary of this research, was prepared and distributed to hunters who had reported hunting sheep within the past 3 years (n = 4300).

II. SUMMARY OF WORK COMPLETED ON PROJECT TO DATE.

Dall's sheep (*Ovis dalli*) are a coveted big game species pursued by a relatively small but passionate group of hunters across 8 mountain ranges in Alaska. The Alaska Board of Game determines state harvest regulations and has recently been inundated with public proposals aimed at altering sheep management. Proposals are directed at reducing a perceived level of competition between resident and non-resident hunters, and to address a possible lack of legal rams available for harvest. Specifically, many hunters believe that all legal rams are harvested each year and want to increase their availability by reducing the hunting opportunities available to non-residents. Alaska hunting regulations are complex, but generally, most sheep hunting is managed under a full-curl harvest strategy. "Full curl" is defined as: the tip of one horn has grown through a 360° circle described by the outer surface of the horn when viewed from the side, or both horn tips are broken, or the sheep is 8+ years old. Since 2004, successful hunters are required to seal sheep horns at Alaska Department of Fish and Game offices. In 2016, we began a study to evaluate horn morphometrics as a tool to inform management decisions. We measured and photographed > 60% of harvested rams in 2016 (474 of 783), 2017 (483 of 798), (2018 538 of 790). For each horn, we quantified age, total horn length, total degree of curl, distance between consecutive annuli, and degree of curl by annulus segments. The relationship between total horn length and degree of curl was significant ($p < 0.01$; $r^2 = 0.37$). The relationship between age and degree of curl was not significant ($p = 0.3$). The

mean age at which rams achieved 360° curl was 8.5 years (range 5 to 12 years). For 2016 and 2017, 19% and 16% of harvested rams were legally taken on criteria other than 360° of curl, while 28% and 27% of rams were harvested in the first year they became legal based on degree of curl. On the other hand, 53% and 57% of harvested rams were available for harvest during at least one previous hunting season after their horns grew through 360° curl. Preliminary analyses indicate hunters are only removing approximately half of all legal rams each year statewide. Estimating ram escapement each hunting season will inform policy decisions.

III. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

None.

IV. PUBLICATIONS

2017 Alaska Department of Fish and Game, [Dall's Sheep Newsletter](#).

Presented results of the project at the 2018 Northern Wild Sheep and Goat Biennial Symposium. Abstract will be published in the proceedings which is in preparation.

Presented results of the project at the 2018 [WAFWA](#) Wild Sheep Working Group winter meeting.

Presented results of the project at the 2019 Alaska Chapter of the Wildlife Society meeting.

Presented results of the project at the 2018, 2019 Alaska chapter of the Wild sheep foundation "sheep hunter university" prior to their annual banquet.

Presented results of the project to the Tanana Valley Sportsmen's association (March, 2019).

Presented results of the project to the Healy advisory (February, 2019).

Presented results of the project at the Alaska Department of Fish and Game's sheep hunting clinic (July, 2019).

V. RECOMMENDATIONS FOR THIS PROJECT

Prepared by:

Brad Wendling

Wildlife Biologist III

Date: 8/19/2019