

**Alaska Department of Fish and Game
Wildlife Restoration Grant**

GRANT NUMBER: AKW-R-9-2019

PROJECT TITLE: Dynamics of waterfowl, foxes, and their habitats on the Yukon-Kuskokwim Delta, Alaska

PERIOD OF PERFORMANCE: January 11, 2019 – December 31, 2021

PERFORMANCE YEAR: 10/01/2020 – 9/30/2021; year 3 of 3-year grant

REPORT DUE DATE: Submit to Coordinator October 2021; due to FAC November 2021

PRINCIPAL INVESTIGATOR: Jason Schamber and Mark Lindberg

Authorities: 2 CFR 200.328
2 CFR 200.301
50 CFR 80.90

I. PROGRESS ON PROJECT OBJECTIVES DURING PERFORMANCE YEAR

OBJECTIVE 1: Monitor brant at the Tutakoke River colony and control sites.

ACCOMPLISHMENTS: Due to the COVID-19 pandemic, we canceled field work in 2020; thus, we were unable to accomplish this Objective. However, we diverted technician support to data management and preliminary analysis of the 2019 data; as well as previous data collected at Tutakoke and Kigigak Island (1988-2018). Specifically, we developed input files to analyze how nest survival of brant and other ground-nesting species varies with levels of fox predation. This included compiling and organizing nesting data collected over 30+ years at the Tutakoke River colony and by multiple agencies across the Yukon-Kuskokwim Delta in that time span.

In summer 2021, we were able to re-establish a semi-permanent camp at the Tutakoke River brant colony to collect data specific to this Objective. We searched for brant nests during the egg laying and early incubation periods and monitored nest fate through to hatching. At hatch, we placed uniquely numbered fingerling tags (web-tags) on the webs of goslings while they were in pipped eggs. We use web-tags to monitor gosling growth rate in early brood rearing by ageing goslings when captured during molt drives at approximately 30 days post hatching. During molt drives at Tutakoke River, we captured and banded 1,393 birds and recaptured 402 previously banded birds. We also were able to conduct molt drives at Kigigak Island with help from staff at the Yukon Delta NWR. At Kigigak Island, we captured and banded 402 birds and recaptured 18 birds.

OBJECTIVE 2: Monitor other breeding birds at Tutakoke River and control sites.

ACCOMPLISHMENTS: In 2020, we were unable to meet this Objective due to cancellation of field work in adherence to COVID-19 safety protocols. However, we made progress compiling nesting data for other species (mostly Spectacled and Common Eiders) from Kigigak Island and Hock Slough that were collected by USFWS and USGS in previous years as input files for nest survival analyses.

In 2021, we were able to conduct field work including monitoring nests of other ground-nesting birds as per this Objective (see Objective 1 progress report). However, we were not able to field a technician at Kigigak Island for nest monitoring and web tagging because COVID-19 protocols prevented us from mixing with the USFWS crew working at this site. We located and monitored the nests of spectacled eiders, common eiders, various duck species, cackling geese, and emperor geese. We also have access to previous data collected on Common Eiders at Tutakoke River. We also were able to obtain nesting data for Spectacled and Common Eiders from Kigigak Island and Hock Slough that were collected by USFWS and USGS in previous years.

OBJECTIVE 3: Collect foxes at the Tutakoke River site to experimentally manipulate fox densities and analyze fox diet through proximate and stable isotope analysis.

ACCOMPLISHMENTS: We did not collect foxes in 2020 because field work was canceled due to the COVID-19 pandemic. Rather, technicians prepared samples collected previously and conducted preliminary laboratory testing. Results from analyses are pending. We also were not able to collect foxes in 2021 for logistical reasons. Recently, fox samples collected on the Yukon-Kuskokwim Delta during previous decades were obtained from other agencies and analyses are underway.

OBJECTIVE 4: Examine extent and condition of grazing lawns

ACCOMPLISHMENTS: We were unable to accomplish the field portion of this Objective in summer 2020 due to COVID-19. However, data management and preliminary analysis of current data and previous data collected at Tutakoke River (1988-2018) were conducted in summer 2020 by technicians who could not be in the field. This preliminary analysis was challenging because of the data complexities; however, initial results were informative. We therefore contracted a biometrician (Dr. Graham Frye) to examine the full data set (1986-2019) using Bayesian analysis, which is most appropriate in this circumstance with missing data (no banding at some sites in some years) and prior information. Results from the full analyses are pending.

II. SUMMARY OF WORK COMPLETED ON PROJECT TO DATE.

This was field season 2 of a 3-year field season project. A UAF graduate student (Elizabeth Ford) is leading the field and laboratory activities and will draft a two-chapter thesis based on the project results. The first season of data collection was conducted in summer 2019 (field work in 2020 was canceled) and a second field season was conducted in 2021. Significant progress was made on preliminary sample preparation, data organization, and laboratory analyses. Elizabeth is focusing on analysis of how nest survival varies with fox predation and plans to also start prepping fox samples for stable isotope analysis. Graham Frye in collaboration with Mark

Lindberg and James Sedinger (former PI on the project) is examining how various spatial and temporal factors, including gosling body condition as affected by grazing lawn quality (Objective 4), influence brood site fidelity. This analysis will provide a useful surrogate analysis for direct studies of variation in grazing lawns, which was disrupted due to COVID-19. Results from these efforts are pending and will be reported on in subsequent periods.

III. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

A Significant Development Report (SFY2020 SDR AKW-R-9-2019) was submitted in March 2020 indicating that the summer field season as planned was to be canceled due to the coronavirus pandemic and associated state-, regional-, and agency-specific safety concerns and travel restrictions. We proposed a modified work plan that aligned with project objectives given the field season was canceled. Four field crew members were retained for the period April – end July to accomplish tasks detailed below:

- 1) Organization and analysis of all relevant and available nesting data for brant and other species. This will include compiling nesting data from multiple graduate research projects at the Tutakoke River colony spanning the past 3 decades; as well as, data collected from other agencies across the Yukon-Kuskokwim Delta in past years. This is consistent with the first 2 objectives of the grant.
- 2) Organize and analyze data to examine changes in growth rates of goslings and how variation in growth rates affect fidelity of females to brood rearing areas. This analysis will complement a Yukon-Kuskokwim Delta grazing lawn analysis that USGS and UNR are conducting – both of which will adequately inform the fourth objective.
- 3) Compile, organize, and prepare fox samples for proximate and stable isotope analysis from this project and past projects. These analyses are consistent with objective 3.

IV. PUBLICATIONS

No publications to report.

V. RECOMMENDATIONS FOR THIS PROJECT This project is scheduled to end December 2021. However, suspending field work in summer 2020 due to coronavirus safety concerns and travel restrictions altered anticipated spending levels and field data collection, necessitating a future amendment to extend the performance period. We have drafted a request for a no-cost extension of the performance period to June 2023 to allow for a third field season and associated analyses to complete project objectives. The request was submitted near the end of October 2021.

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