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-R-3-2018

PROJECT NUMBER: 1.0

PROJECT TITLE: Tracking Survival and Harvest Opportunity of Emperor Geese Following 30 Years of Hunt Closures

PERIOD OF PERFORMANCE: March 1, 2019 to June 30, 2022

PERFORMANCE YEAR: March 1, 2019 to September 1, 2019; year 1 of a 3-year grant

REPORT DUE DATE: September 1, 2019

PRINCIPAL INVESTIGATOR: Tyler Lewis

COOPERATORS: U.S. Fish and Wildlife Service – Yukon Delta National Wildlife Refuge; U.S. Geological Survey – Alaska Science Center

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Authorities: 2 CFR 200.328
2 CFR 200.301
50 CFR 80.90

I. PROGRESS ON PROJECT OBJECTIVES DURING PERFORMANCE YEAR

OBJECTIVE 1: Estimate seasonal and annual survival rates of adult female emperor geese throughout their breeding range in Alaska.

ACCOMPLISHMENTS: We deployed 30 satellite transmitters on adult female emperor geese nesting on the Yukon-Kuskokwim Delta, Alaska, during June of 2019. We captured adult females on their nests using bow nets. Upon capture, birds were placed in small kennels and immediately transported to surgical facilities for implantation of transmitters into their body cavity. Transmitters weighed 60 g and are anticipated to last up to 3 years.

Transmitters were programmed on a repeating duty cycle which alternates 6 hours on (i.e., transmitting location data to satellites) and 72 hours off. In addition to latitude and longitude, transmitters collect data on body temperature and battery voltage, allowing us to track mortalities in near real-time. We assume a bird has died if sensors indicate a drop in body temperature with no concurrent decline in battery voltage. Moreover, our transmitters were programmed to begin continually transmitting a mortality signal when

body temperatures suddenly drop, thus reducing the risk that transmitters experience total failure before the mortality event is transmitted during an 'on' cycle.

Because our transmitters were recently deployed (~2 months ago), we are unable to formally estimate survival rates and their associated variances for this reporting period. Over the 2 months since our transmitters were deployed, however, survival has been 100%. As more data becomes available, we will estimate annual and seasonal survival rates of marked birds, defining seasons by the major annual events of emperor geese such as spring migration, breeding, fall migration, winter, and harvest period. Moreover, our sample size will increase over the next 2 years as we deploy ≥50 satellite transmitters on the Seward Peninsula and southern Yukon Delta.

OBJECTIVE 2: Assess seasonal availability of emperor geese to subsistence and sport hunters.

ACCOMPLISHMENTS: The current fall/winter hunt of emperor geese splits a statewide quota of 1,000 birds among 7 hunt areas. Season dates vary among the hunt areas to accommodate seasonal shifts in distributions of emperor geese, with season openings ranging from September 1 to October 16. Using location data from our satellite transmitters, we will determine timing of migration to and from statewide regions used for sport and subsistence harvest. To date, we have location data for a 2 month period that does not overlap with traditional harvest periods, thus restricting our ability to assess this objective at this time. Once collected, these data may be used to refine hunting regulations and inform future co-management decisions, including allocation of regional quotas.

OBJECTIVE 3: Determine population delineation of emperor geese breeding on the Seward Peninsula.

ACCOMPLISHMENTS: To date, we have deployed satellite transmitters on the Yukon-Kuskokwim Delta, where the majority of emperor geese (~90%) breed in Alaska. Beginning in June of 2020, we plan to deploy 15-20 satellite transmitters on adult female emperor geese on the Seward Peninsula, which is their primary breeding area in Alaska outside the Yukon-Kuskokwim Delta. Analysis of this objective will occur after deployment of these transmitters on the Seward Peninsula.

OBJECTIVE 4: Describe survival and distribution of emperor geese during the flightless molt in Russia.

ACCOMPLISHMENTS: As noted under objective 1, we deployed 30 satellite transmitters on adult female emperor geese during June of 2019. Several of these birds abandoned their nests following transmitter implantation and undertook a molt migration to Russia. Collection of data from this period is ongoing and we anticipate that similar migrations to Russia will occur during upcoming summers.

OBJECTIVE 5: Determine observation availability of emperor geese during aerial surveys.

ACCOMPLISHMENTS: The U.S. Fish & Wildlife Service conducts an aerial survey of breeding emperor geese on the Yukon-Kuskokwim Delta during late May or early June each year. Data from this survey provides the principal management tool for emperor geese, whereby harvest openings and closures are predicated on discrete numbers of birds observed. We plan to examine timing of this aerial survey with arrival and departure times of our satellite marked birds to the Yukon-Kuskokwim Delta, thus providing novel information on goose availability during aerial surveys. However, because we deployed our satellite transmitters in June of this year, we are currently unable to assess this objective; tracking of annual arrival and departure times to the Yukon-Kuskokwim Delta breeding grounds will be begin in 2020.

OBJECTIVE 6: Describe winter distribution and habitat use of emperor geese.

ACCOMPLISHMENTS: Our tagged emperor geese will be undergoing their first winter with satellite transmitters during winter 2020/2021; thus, data on winter distribution and habitat use is not available for this reporting period.

II. SUMMARY OF WORK COMPLETED ON PROJECT TO DATE.

This project is in year 1 of 3, and a limited amount of data (~2 months of transmitter time) has been collected thus far. All data for this project will be collected using satellite transmitters with lifespans of 3-4 years. Accordingly, the period of data collection (5-6 years) is considerably longer than the current lifespan of project funding. Nonetheless, we present several preliminary findings below:

- We captured 30 female emperor geese on coastal wetlands of the Manokinak River, Yukon-Kuskokwim Delta, Alaska, during the first week of June. See Figure 1 for a map of capture locations.
- As of August 18, 2019, all 30 of our tagged emperor geese were alive and transmitting. For waterfowl, a 100% survival rate following internal implantation of transmitters is extremely uncommon. Accordingly, we consider year 1 of our study a resounding success, greatly validating our trapping and surgical procedures.
- We obtained >800 unique locations from our satellite transmitters thus far, adding a new location per individual every 72 hours.
- The average weight (± 95% CI) of tagged female geese, all of which were captured on their nests, was 1833 ± 48 g.
- As of the first week of July, 10 tagged geese remained on the Yukon-Kuskokwim Delta. Of these birds, 9 individuals likely hatched their nests, remaining near their nest sites to raise their broods (Fig. 2).

- As of the first week of July, 20 tagged geese had migrated to coastal lagoons of northeastern Siberia to undergo the flightless wing molt. These birds either abandoned their nests following capture, or experienced nest loss from predators (Fig. 2).
- Several of our tagged geese used Saint Lawrence Island in the Bering Sea as a stopover site during their migration from the Yukon-Kuskokwim Delta to Siberia (Fig. 3)
- Distribution of tagged geese remained relatively unchanged from July to August, with the exception of 1 goose that migrated from Alaska to Russia during this period. As of the first week of August, 21 tagged geese were in coastal lagoons of northeastern Siberia, while 9 geese remained on the Yukon-Kuskokwim Delta. (Fig. 4).

III. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

To complete our first year of research, we budgeted $112,945 and spent $121,722, thus exceeding our year 1 (FY19) allocated budget by $8,777 (Table 1). This excess cost was largely attributable to unforeseen obstacles involved with accessing our remote study site. Our original budget was based on hiring local boats to shuttle our crew and gear to our field site, about 10-12 hours away by boat. However, this plan proved administratively unworkable, time inefficient, and less safe than alternate options; accordingly, we hired an air charter to transport our crew and gear to the study site, resulting in higher than anticipated contractual costs (see Table 1 – Contractual). Moving forward, we are planning to plug this budget gap by 1) seeking more funding – we recently submitted a proposal to the Alaska Capital Improvement Projects funding committee, asking for additional funds to support our emperor goose research, and 2) exploring cost cutting measures, including reduced charter time and hiring of volunteers.

Budget Line	FY19 Allocation	FY19 Expenditures	Balance
1000 - Personnel	$14,545	$13,047	$1,498
2000 - Travel	$9,400	$4,679	$4,721
3000 - Contractual	$12,500	$25,291	($12,791)
4000 -Supplies	$76,500	$78,705	($2,205)
TOTAL	$112,945	$121,722	($8,777)

IV. PUBLICATIONS

There are no publications for this project at this time.

V. RECOMMENDATIONS FOR THIS PROJECT

Continue with project as initially planned.

Prepared by: Tyler Lewis – Principal Investigator, Alaska Department of Fish and Game

Date: August 28, 2019

Figure 1. Capture locations of female emperor geese that were trapped on their nests and subsequently marked with satellite transmitters during the first week of June, 2019. All of the geese were captured along the Manokinak River, on the Yukon-Kuskokwim Delta, Alaska.

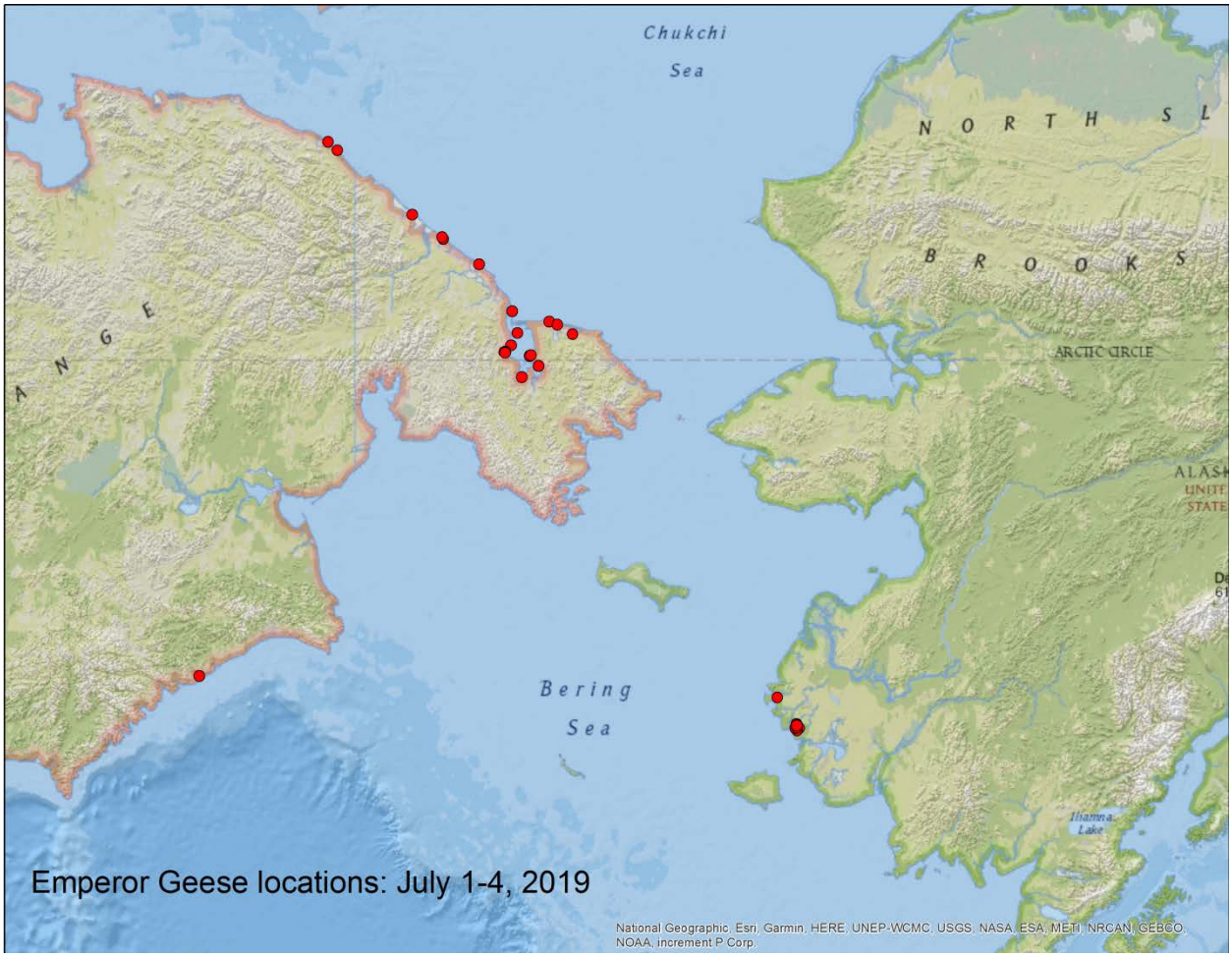

Figure 2. Locations of tagged emperor geese during the first week of July, 2019. As of these dates, 20 emperor geese had migrated to northeastern Siberia to undergo the flightless molt, while 10 geese remained on the Yukon-Kuskokwim Delta.

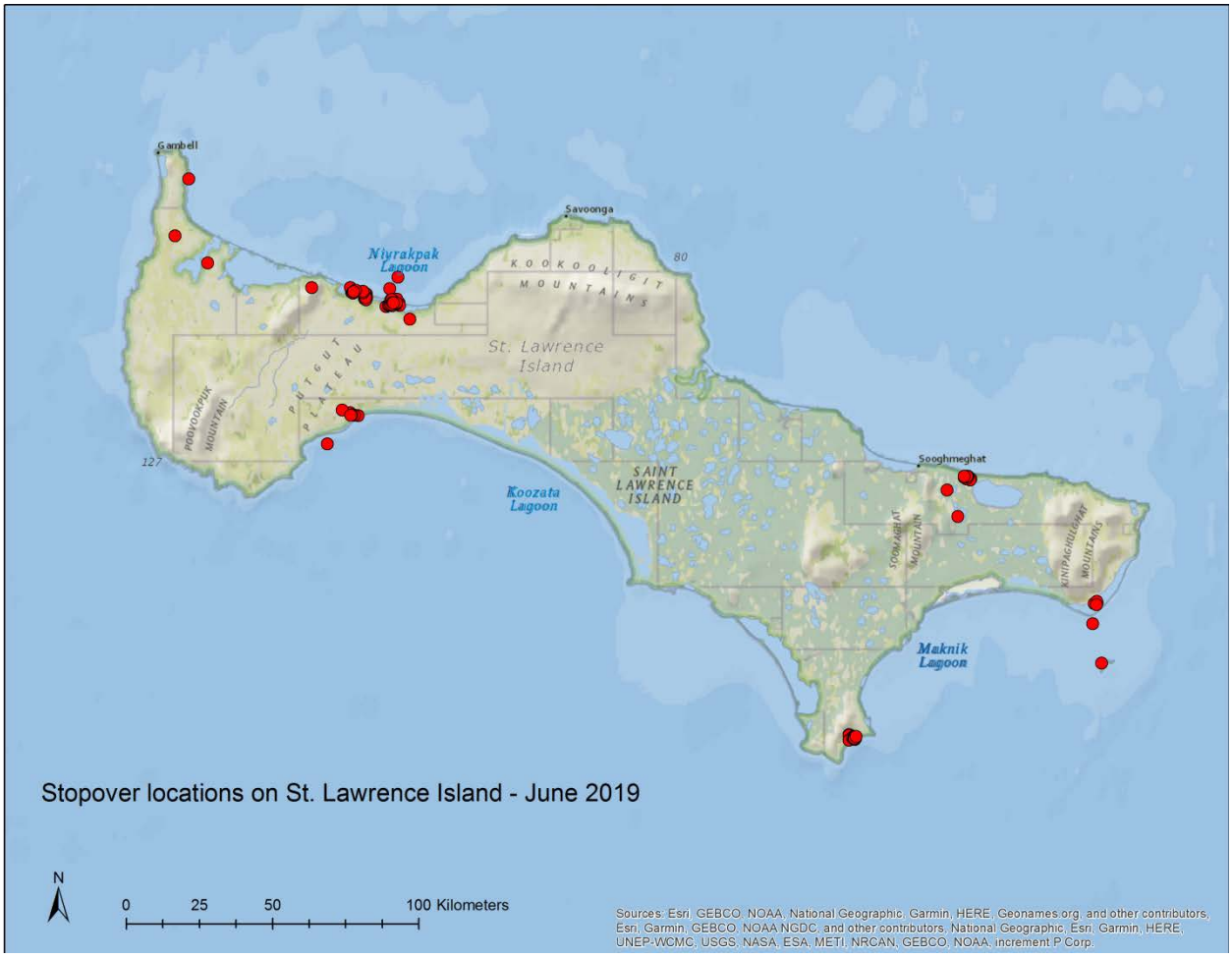

Figure 3. Stopover locations of tagged emperor geese on St. Lawrence Island during their migration from the Yukon-Kuskokwim Delta in Alaska to northeastern Siberia.

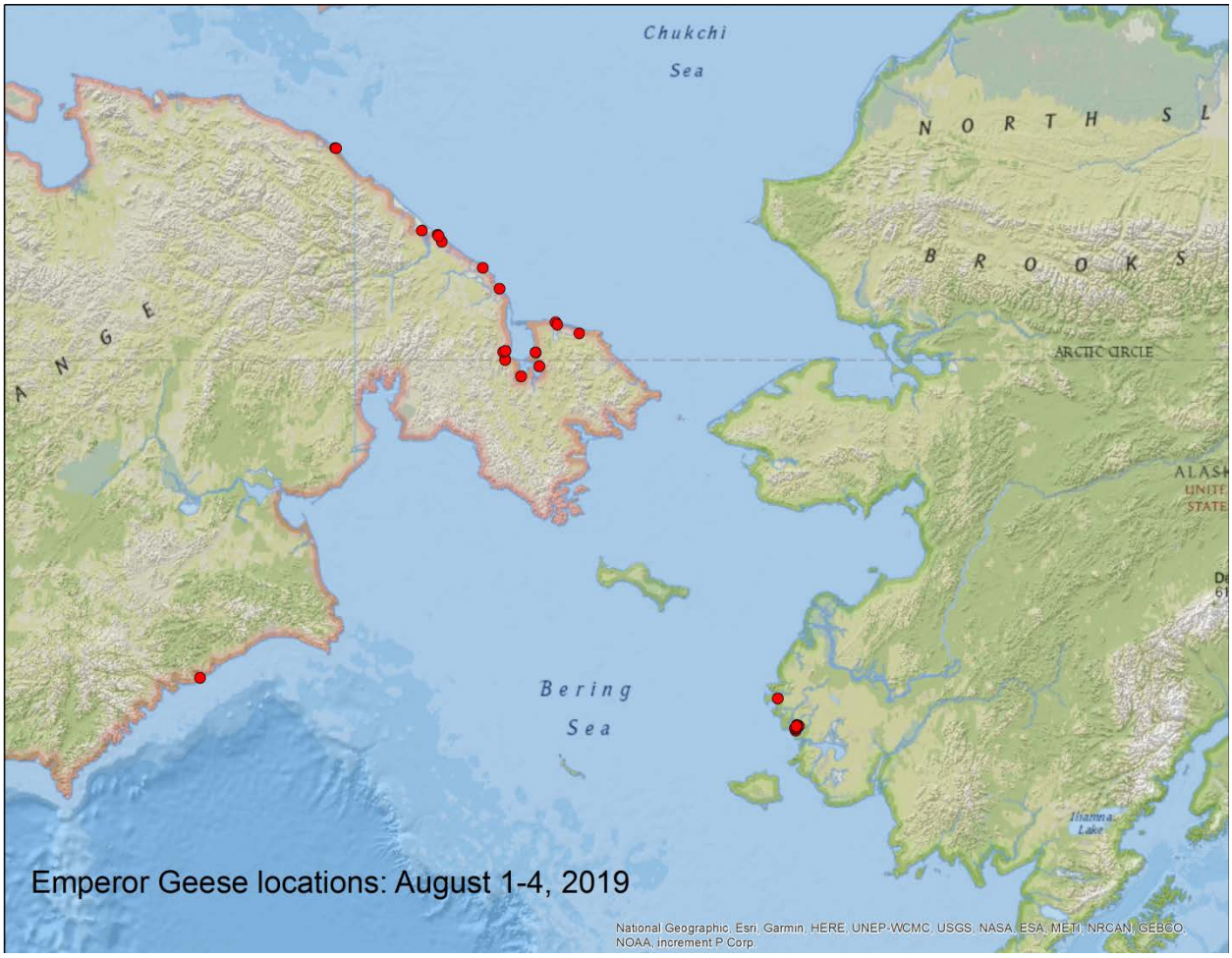

Figure 4. Locations of tagged emperor geese during the first week of August, 2019. As of these dates, 21 emperor geese were located in northeastern Siberia while 9 geese remained on the Yukon-Kuskokwim Delta.