ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

Alaska Department of Fish and Game
State Wildlife Grant

Grant Number: **T-21** **Segment Number: 1**

Project Number: 26.0

Project Title: Olive-sided Flycatcher breeding biology and migration in central Alaska.

Project Duration: 1 July 2013 – 30 June 2018

Report Period: 1 July 2013 – 15 April 2014

Report Due Date: 28 September 2014

Principle Investigator: Julie Hagelin, ADF&G

Project Location: Central Alaska

I. SUMMARY OF WORK COMPLETED ON JOBS FOR LAST SEGMENT PERIOD ONLY

Objective 1: Evaluate changes in habitat and Olive-sided Flycatcher occupancy across 20 years by taking advantage of a historical dataset of breeding territories.

Accomplishments:

1. Three technicians and I conducted the first of three field surveys to detect whether Olive-sided Flycatchers still occupy historical breeding habitat after 20 years. The protocol I designed included:
    - A > 99% probability of detecting male song over multiple visits to each of ten historical breeding sites.
    - A survey method covering an area of ~800 ha at each site.
    - Records of all bird species of conservation concern seen and heard, to further evaluate any long-term changes in the bird community at the site.

    Federal Aid money was spent on salary, field equipment/supplies and transportation for this and the next accomplishment described below.

2. Technicians and I also collected our first season of plant data to evaluate habitat change at historic sites. Our current focus is on select species for which we have adequate historical data, as some files stored on 1990's era computer disks were unrecoverable. Plants we quantified are common to boggy/permafrost regions at our historical sites and prone to rapid change in a drying, warming climate.

3. I also developed an alternative method to evaluate habitat change at historical OSFL breeding sites, given the unexpected loss of some historical data (described above). I am currently collecting GIS data to examine any major successional change at historical sites between 1994 and present. Federal aid money was spent on training so that I can conduct basic analyses with GIS data.

Objective 2: Quantify biomass of aerial arthropods at breeding sites and assess relationship(s) with site occupancy and habitat parameters.

Accomplishments:

1. I established a cooperative research agreement with University of Alaska Museum of the North Insect curator, Dr. Derek Sikes. The museum will analyze all insect samples collected in our multi-year study. Samples from the first season (described below) are currently being processed. Federal Aid money was spent on sample processing conducted by museum.

2. Field technicians and I deployed aerial insect traps for the first of three seasons of sampling. Insect traps were emptied every two weeks at ten historical OSFL sites and four active nest sites discovered in 2013. Sample sizes will increase in coming seasons to compare whether birds at active sites have access to greater insect biomass than historical sites (which are largely inactive), as food is hypothesized to be limiting. Insect data will also be correlated with habitat parameters and site occupancy (Objective 1). Federal Aid money was spent on salary, field equipment/supplies and transportation.

3. We unexpectedly discovered that our data are also relevant to a broader conservation concern regarding the decline of aerial insectivorous birds. Our study is the first to passively collect aerial insects in black spruce forests of central Alaska. Hence, it fills an important knowledge gap about the available prey that feed a broad suite of declining bird species within the boreal ecosystem.

Objective 3: Conduct a pilot study to assess the impact of geolocators on apparent survival of adults, and thereby determine the feasibility of this technology for describing adult migratory path(s) and wintering sites.

Accomplishments:

1. I established a cooperative research agreement with colleagues at U.S. Fish and Wildlife Service (Steve Matsuoka, Jim Johnson) to deploy geolocators on OSFL that breed in Alaska. My collaborators have experience deploying similar units on other landbirds of concern. I also successfully obtained all scientific and banding permits to deploy tracking units and collect biological samples.

2. Technicians, collaborators and I created a harness system for putting geolocators on OSFL, searched habitats to find adults on breeding territories, and established a decoy and playback protocol to trap individuals. I was also trained in how to deploy geolocators on live birds. Federal Aid funds were spent on salary, geolocator units, field supplies and equipment, and transportation.

3. We deployed a total of eight geolocators on breeding adults during our first of three field seasons. We are very pleased with our success! Our sample size will increase in coming seasons, enabling us to evaluate the efficacy of the geolocators to reveal migratory paths

of OSFLs. Based on published survival data, we estimate there is a 99% probability of recovering at least one of the eight geolocators next season, provided the units do not increase mortality of adults.

Objective 4: Quantify levels of mercury contamination in birds from central Alaska.

Accomplishments:

1. I established a cooperative research agreement with Dr. David Evers at the Biodiversity Research Institute (BRI) to measure mercury levels in biological samples collected from OSFLs.

2. We obtained eleven feather samples during our first season of work. This included the eight birds we trapped for geolocators (Objective 3) plus other sources. Sample size will increase in coming seasons. BRI analyzed the feather samples. Federal Aid funds were spent on sample testing.

3. Analysis of this initial dataset has already produced an unexpected result germane to conservation.
   Briefly:
   - Birds captured in Fairbanks appear to have significantly higher levels of feather mercury compared to Anchorage. Feather contaminants reflect wintering habitat, as OSFL's undergo a complete body molt during winter.
   - The difference in mercury indirectly suggests the Fairbanks and Anchorage populations may winter in different locations (where they experience different stressors).
   - We will have a more definitive answer to the birds' migratory route(s) and wintering location(s) as we recover geolocators next season.

II. PUBLICATIONS

I submitted a paper to the *Wilson Journal of Ornithology* in January 2014 that has been accepted, pending minor revision.
Summary of manuscript:

1. I described two OSFL behaviors (related to feeding and reproduction) that we incidentally observed during field work and were previously unknown for this species.
2. I also made a case for food limitation in high-latitude populations of OSFL, as adults arrive to breed prior to the emergence of most insects. If food is limited early in the season, specific habitat features that may be predictive of where birds breed. For example, visual stimuli, such as flowering vegetation, experimentally increases the probability that other species of flycatchers will "stopover" at a particular site during spring migration.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

None.

IV. RECOMMENDATIONS FOR THIS PROJECT

None.

Prepared by: Julie Hagelin, ADF&G
Date: 8/26/14