

**FEDERAL AID  
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  
State Wildlife Grant**

**GRANT AND SEGMENT NR:** T-1-16

**PROJECT NUMBER:** 6

**PROJECT TITLE:** Passerine Data Analysis and Monitoring at the Creamer's Field Migration Station

**PARTNER:** Alaska Bird Observatory (ABO)

**PRINCIPAL INVESTIGATORS:** Sue Guers (ABO)

**COOPERATORS:** Jackson Whitman (ADF&G)

**PROJECT DURATION:** September 30, 2006 – June 30, 2008

**REPORT PERIOD:** October 1, 2007 – June 30, 2008

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**I. PROBLEM OR NEED THAT PROMPTED THIS RESEARCH**

Landbirds fill important ecological, economic, and aesthetic roles in our environment. Populations of some once-common species have declined at alarming rates in recent decades. Population trend data are used by federal and state agencies to help identify species of conservation interest and to take proactive action aimed at “keeping common species common.” Little information is available to adequately gauge the health of Alaska’s landbirds. A recent evaluation of the 448 species of landbirds breeding in Canada and the United States revealed that the majority of species breeding in North America’s arctic and boreal ecosystems are not adequately monitored by any of North America’s monitoring program. This is due to the paucity of surveys north of southern Canada (Bart et al. 2004, Rich et al. 2004). Over a decade ago, Boreal Partners in Flight (BPIF) recognized the lack of data available to assess the health of Alaska’s 135 species of breeding landbirds (BPIF 1999). Subsequently, they have spent considerable effort evaluating and refining techniques for monitoring populations of landbirds in the state: Breeding Bird Survey (BBS), Alaska Landbird Monitoring Survey (ALMS), and Landbird Migration Monitoring (Doyle and Andres 1998, Handel 2000, Handel and Cady 2004).

**II. REVIEW OF PRIOR RESEARCH AND STUDIES IN PROGRESS ON THE PROBLEM OR NEED**

The Alaska Bird Observatory (ABO) has operated the Creamer’s Field Migration Station (CFMS), a constant-effort mist-netting station located on Creamer’s Field Migratory Waterfowl Refuge since 1992. The CFMS is the northernmost migration-monitoring station in North America, and the longest-running station in Alaska and the Yukon Territory. To date, we have captured and banded over 83,000 birds of 76 species, documented the range expansion of several species, published eight manuscripts documenting landbird migration and associated topics

(Benson 2000, Benson et al. 2000, Benson and Winker 2001 and 2005, Benson et al. 2006, Erwin and Shaw 2002, Erwin et al. 2004, Guers 2006), and have developed population indices and trends for a number of species. In addition, hundreds of interns and biologists have been trained to mist-net and band birds. Further, tens of thousands of people—mostly children participating in school field trips—have visited our banding station to learn about Alaska's birds, interact with wildlife biologists, and observe research and wild birds up close.

As well as providing much-needed baseline inventory and life history information of migrating landbird species at Creamer's Refuge, this study also has long-term monitoring implications. Interior Alaska provides a unique opportunity to study species-level responses to the extreme climatic conditions found at high latitudes. In addition, global climate change will be more pronounced at high latitudes (IPCC 2002) and the Western Boreal Forest is subject to one of the fastest changing climates in North America (Saporta et al. 1998, Anderson et al. 1998, NAST 2000). Data collected with this study allows us to examine how long-term climate change affects fattening and molt strategies, juvenile dispersal, phenology of breeding and migration, and survival of adults.

The Fairbanks community has demonstrated overwhelming support for the CFMS since its inception in 1992 by contributing thousands of dollars and a tremendous number of volunteer hours. The CFMS has also financially attracted support from small businesses and corporations throughout Alaska as well as collaborative research with the University of Alaska Fairbanks. This diverse support illustrates the local significance of this project—it is accessible to the public and allows public observation and participation in wildlife research. It also demonstrates ABO's ability to manage a multi-faceted project and prepare timely reports for multiple contracts, grants, and cooperative agreements.

### **III. APPROACHES USED AND FINDINGS RELATED TO THE OBJECTIVES AND TO PROBLEM OR NEED**

**OBJECTIVE 1:** Move CFMS data from Excel to an Access database and re-proof all banding and recapture records by 30 November 2006.

All CFMS data have been moved from Excel into an Access database and all 83,000+ records have been proofed. The initial completion date of 30 November 2006 was not met due to an under-estimation of the time it would take to complete such a huge task while also completing other duties at ABO. This objective was completed at the end of February 2008. In addition, ABO has initiated a collaboration with Microsoft focusing on developing new software that would make entry and proofing of our banding records an easier and more efficient process. They are excited about our dataset and will begin work on the project 1 September 2008.

**OBJECTIVE 2:** Using data from four migration stations in Alaska, publish a manuscript that examines migration of Wilson's Warblers in Alaska by 30 December 2006.

A manuscript entitled "Differential timing of Wilson's Warbler migration in Alaska" was published in the December 2006 issue of the *Wilson Journal of Ornithology* (118:547-551). The authors were: Anna-Marie Benson (ABO), Brad Andres (USFWS), Bud Johnson (USFWS), Susan Savage (USFWS), and Susan Sharbaugh (ABO). A PDF of this manuscript is attached.

**OBJECTIVE 3:** Prepare a report on our collaborative Avian Influenza surveillance efforts with the University of Alaska Fairbanks by 30 December 2006.

This collaboration with Dr. Jonathon Runstatler of the Institute of Arctic Biology began in the fall of 2005 and continues to the present. As of the end of fall banding season 2007, UAF has swabbed ~5600 birds of 45 species. At this time, no birds were found to have the highly pathogenic strain of the H5N1 Avian Influenza virus. The attached table shows the bird species and the total number of swabs taken for each species at CFMS from fall 2005-fall 2007.

OBJECTIVE 4: Continue operating the farthest north migration station in North America to continue monitoring effects of climate change on migration timing and relative abundance of songbirds migrating through Creamer's Refuge.

We completed our 17th spring migration monitoring season at CFMS in June 2008. The CFMS is a constant-effort mist-netting station that has been in continuous operation since 1992. It is located on Creamer's Field Migratory Waterfowl Refuge, -a state game refuge managed by the Alaska Department of Fish & Game. The CFMS encompasses approximately 20 ha which includes a good representation of the common habitat types within the boreal forest of interior Alaska. The station is operated under Permit# 22759 from the USGS Bird Banding Laboratory and following the protocols established in the ABO Creamer's Field Migration Station Operation's Manual (Guers 2007). Incidental observations and weather data are recorded during each day of banding. Our standardized netting protocol uses an array of 34 standard 12-m and two standard 6-m mist nets. Nets are operated daily during spring and fall, weather permitting, and are checked at 30- to 45-minute intervals. Birds are banded with USFWS bands, and data are collected to determine age, body mass, wing length, breeding condition, stage of molt, and body condition. ABO relies on the assistance of local volunteers to aid in station operation. Two to three biologists serve as primary banders-in-charge. Their responsibilities are to mist net and band songbirds, train and supervise interns and volunteers, and provide oversight for good data collection. Two intern/trainees undergo intensive training in bird identification, banding skills, ageing techniques, maintenance of nets, and data collection.

OBJECTIVE 5: Conduct a comprehensive analysis of 15 years of CFMS data.

ABO is in the process of conducting comprehensive analyses of the 16-year dataset from CFMS, now that the data is in one place and proofed. It's now much easier to ask these sorts of questions and analyze the data to do so:

- a. Abundance estimates and the comparison of migration timing between CFMS and Tok were completed in May 2007; (see b)
- b. Ability to detect songbird population trends in interior Alaska was evaluated using pooled migration data from CFMS and Tok in May 2007; these results are included in a manuscript being prepared for the Journal of Wildlife Management (see attached)
- c. Variation in the proportion of adults vs. juveniles of all species captured at CFMS during fall migration was calculated. These data will be incorporated in a manuscript that examines molt and migration strategies of songbirds migrating through CFMS in the fall;
- d. Calculation of mean spring and fall passage dates for all species at CFMS is in progress; we are updating the analyses to include spring 2008 data. This data (through 2007) was presented by Sue Guers at the Alaska Bird Conference in March 2008 and the updated analyses will be presented by Sue Guers at the upcoming American Ornithologists' Union meeting in August;
- e. Inter-annual and long-term trends in abundance and capture rates for all species caught at CFMS during both spring and fall seasons are analyzed for both the spring and fall

- progress reports. These reports were submitted to ADF&G and are also available on the ABO website;
- f. CFMS operated for the spring and fall banding seasons in 2007 and during the spring banding season in 2008;
  - g. Weather data for the spring and fall banding periods has been compiled and used in analyses of both arrival and departure dates. Eric Stevens from the Geophysical Institute at UAF was kind enough to provide those data from the airport weather station;
  - h. An annual progress report was submitted to ADF&G in August 2007;
  - i. The CFMS and Tok banding data were not pooled with the Camp Denali banding data due to differences in protocols. Camp Denali operated on a compressed fall banding schedule and did not operate in 2007 and 2008. These data will be used in the future to build an argument supporting a network of migration stations rather than stand-alone stations;
  - j. As stated in "g", different weather variables are being used to look at differences in capture rates; including Julian date, daily maximum and minimum temperatures, barometric pressure, Mean May temperature, greenup dates, wind speed and precipitation.
  - k. We have not looked at Breeding Bird Survey data from Alaska as some routes are known to be suspect (as per the USGS website—most of the routes haven't been surveyed long enough to be statistically rigorous; however, future analyses may look at certain routes in comparison with banding data at CFMS);
  - l. Results and accomplishments of the 16-years of banding at CFMS were presented as a paper by Sue Guers at the Alaska Bird Conference in Fairbanks in March 2008, and a poster will be presented at the American Ornithologists' Union meeting in Portland this August by Sue Guers;
  - m. Mean arrival dates of spring migrants to CFMS have been updated to incorporate the spring 2008 data, these analyses include Mean May temperature and greenup dates for the area in addition to the designation of migration strategy (i.e. Long-distance vs. short-distance migrants);
  - n. Spring banding continued and was completed 7 June 2008;
  - o. ABO's Scientific Advisory Council and the Migration Program Manager will meet in the fall to set 2008-2010 CFMS research goals;
  - p. Four manuscripts are in preparation and will be submitted for publication in 2009.
    - The first manuscript will address the quality of stopover habitat at CFMS. Data on recaptures (birds caught multiple times in the same year) will be summarized to examine changes in body mass during fall stopovers at CFMS.
    - The second paper will focus on spring and fall departure dates and their correlation with weather events (mean May temperature and greenup dates in Fairbanks 1992-2008 may give insight into the avian response to a changing climate).
    - Molt and migration strategies of our migrants will be addressed in the third manuscript. The patterns seen here at CFMS can be compared to those in the lower 48.
    - The fourth paper will report the range expansion of several species into the interior of Alaska and then explain how landbird migration monitoring helps document these expansions that might have gone unnoticed for many years.
    - Literature searches and analyses for these manuscripts are almost complete; writing will begin after the fall banding season.

- q. The final SWG report will submitted to ADF&G by 1 August 2008.

#### **IV. MANAGEMENT IMPLICATIONS**

ABO has a 16-year data set from CFMS—the longest-running constant-effort mist-netting station in Alaska and northern Canada. We have accumulated over 83,000 records of banded songbirds. Current funding has enabled us to analyze these data to detect trends in songbird populations and relate them to various environmental cues such as climate change, stochastic weather events, and habitat change. The results of these analyses will be submitted for publication, making them available to land managers, policy makers, and other interested parties. This funding has also allowed us to add several more years of songbird migration data to the existing dataset of migration monitoring and has facilitated the training of eight passerine banders and intern/trainees at the CFMS. The station also attracts volunteers from a wide range of ages, backgrounds, and political viewpoints, which in turn helps build broader community support for the program and for bird conservation.

Conservation of landbird populations requires an understanding of the habitat needs and the demographic mechanisms necessary to sustain viable populations (Martin 1992, Nur and Geupel 1993). These demographic data can often provide early warning signals of problems before actual declines can manifest (Ralph et al. 1993, Hussell and Ralph 2005). Thus, ABO proposes that the landbird monitoring program at the Creamer's Field Migratory Refuge be expanded beginning in May 2009. In addition to the constant-effort mist-netting station, which primarily collects migration data, we will include a regime of nest searching and monitoring, point counts, spot mapping and vegetation assessment. Used alone, these techniques answer only some of the questions regarding population size and trend. Together, these methods will provide much-needed demography and population data for Alaska's boreal forest landbirds.

There is little to no information on the population status and trends of most of Alaska's breeding landbird species. Alaska's Comprehensive Wildlife Conservation Strategy (CWCS) prioritized the need for more effective community and species-specific inventory and monitoring programs for landbirds. These programs establish baseline population estimates for future comparison, identify key areas and habitats for conservation, and detect population declines before species become threatened.

The CFMS project helps to meet Alaska's CWCS recommendations as well as planning goals established by the BPIF (1999); raises the profile of Alaska's CWCS through general interest and professional publications; develops and distributes quantitative information about select landbird species; and continues and enhances citizen-science and education opportunities for residents of Fairbanks.

The CFMS project directly addresses two of Alaska's CWCS primary recommendations. First, a landbird monitoring program at Creamer's Field helps to fill information gaps by collecting baseline inventory and life history information on select species. It also is helping to synthesize and distribute scientific information about species distribution, abundance, and habitat use for non-game species. Second, a landbird monitoring program at Creamer's Field meets the recommendation to conduct long-term monitoring of select species and their habitats and to use this information to monitor the effects of climate change on wildlife and habitats.

**V. SUMMARY OF WORK COMPLETED ON JOBS FOR LAST SEGMENT PERIOD ONLY (October 1, 2007 – June 30, 2008)**

JOB/ACTIVITY 1A: Move CFMS data from Excel to an Access database and re-proof all banding and recapture records by 30 November 2006.

The initial timeframe given for this objective seriously underestimated the amount of time needed to complete this activity. All banding records were moved into Access and were re-proofed by the end of February 2008. The spring 2008 banding data was entered directly into Access. The dataset contains 83,857 records.

ABO had initiated a collaboration with Microsoft to develop new software that will facilitate easier and more efficient data entry, data proofing, and data queries.

JOB/ACTIVITY 3A: Prepare a report on our collaborative Avian Influenza surveillance efforts with the University of Alaska Fairbanks by 30 December 2006.

This collaboration with Dr. Jonathon Runstatler began in the fall of 2005 and continues to the present. To date, the University of Alaska Fairbanks personnel have swabbed ~5600 birds of 46 species. At this time, no birds were found to have Avian Influenza and all were negative for the Highly Pathogenic H5N1 strain of Avian Influenza (Table 1).

Table 1. Bird species and number of swabs taken by UAF in monitoring Avian Influenza and H5N1 at Creamer's Field Migration Station, Fairbanks, AK from fall 2005-fall 2007.

<u>Species</u>	<u>Number swabbed (2005-2007)</u>
Alder Flycatcher	26
American Robin	134
American Three-toed Woodpecker	1
Arctic Warbler	1
American Tree Sparrow	625
Black-backed Woodpecker	1
Black-capped Chickadee	227
Blackpoll Warbler	31
Boreal Chickadee	14
Bohemian Waxwing	4
Brown Creeper	1
Chipping Sparrow	1
Common Redpoll	246
Common (Wilson's) Snipe	1
Downy Woodpecker	8
Fox Sparrow	40
Golden-crowned Sparrow	2
Gray-cheeked Thrush	35
Gray Jay	3
Gambel's White-crowned Sparrow	111
Hammond's Flycatcher	124
Hairy Woodpecker	1
Hermit Thrush	72
Hoary Redpoll	1
Lesser Yellowlegs	3
Lincoln's Sparrow	524

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Myrtle Warbler	1044
Northern Harrier	2
Northern Waterthrush	143
Northern Shrike	2
Orange-crowned Warbler	437
Pine Siskin	1

JOB/ACTIVITY 4A: Continue operating the farthest north migration station in North America to continue monitoring effects of climate change on migration timing and relative abundance of songbirds migrating through Creamer's Refuge.

**October 1, 2007 – June 30, 2008: the following summarizes the spring 2008 banding season (21 April—7 June):**

1. Twenty-six standard mist nets were operated for 6 hours, weather permitting, on alternate days from 21 to 30 April and daily from 1 May – 7 June 2008. Nets were operated for a total of 5,445 hours.
2. Total captures were 897 new and previously banded birds. We captured 676 individuals representing 27 species—625 were new captures and 51 were returning birds banded in previous years. Recaptured birds (birds banded this season and re-captured again) comprised the remaining 173 captures. The five most abundant newly-captured species were Common Redpoll (216), Yellow-rumped Warbler (74), Dark-eyed Junco (56), Northern Waterthrush (46) and American Robin (43). These species comprised 70% (435/625) of new captures.
3. Spring 2008 proved to be an excellent season for capturing migrant songbirds. The increase in number of birds captured was due to an abundance of Common Redpolls that had remained in the area longer than normal. Capture rates (per 1000 net hours) of Common Redpolls were the highest in over 5 years. A decrease in the total number of species caught in spring 2008 compared to spring 2007 is due to the decrease in the number of shorebird species caught. There was a decrease in the number of Solitary Sandpipers and we didn't catch any Lesser Yellowlegs or Wilson's Snipe compared to previous years and noted in previous reports submitted to ADF&G documenting these findings. Many warbler species, including Blackpoll, Orange-crowned, Wilson's and Yellow Warbler, showed higher capture rates in 2008 than for 2007 (Table 3). Capture rates for Northern Waterthrush and Yellow-rumped Warbler are to 2007. Capture rates for Gray-cheeked and Swainson's Thrush were the highest in CFMS history; Hermit and Varied Thrush and American Robin capture rates remained comparable to previous years. Declines in capture rates were recorded for several species including Lincoln's and Gambel's White-crowned Sparrow. Capture rates remained stable for Dark-eyed Junco and increased for Savannah Sparrow. Woodpecker, Flycatcher and Chickadee capture rates were unchanged from previous seasons.
4. Interesting captures include: 3 Solitary Sandpipers, a Hairy Woodpecker, a Varied Thrush, 6 Rusty Blackbirds, 4 Hoary Redpolls, and a male Sharp-shinned Hawk.
5. The mortality rate at CFMS for the spring was 0.3%, much lower than the accepted rate of 1-2%.

6. Trained 2 new banders and 1 intern for CFMS this spring—the banders will continue through the fall season. Held a volunteer orientation session before the spring banding season that was attended by ~17 new and returning volunteers and a second training session in July to prepare for the fall season.
7. Thirty-five volunteers provided 571 hours of assistance.
8. Bird-banding presentations were delivered to 478 people (18 groups) in cooperation with the Alaska Department of Fish and Game Creamer's Nature Program. Informal banding demonstrations were presented to an additional 153 independent visitors.

JOB/ACTIVITY 5A: Conduct a comprehensive analysis of 15 years of CFMS data.

- a. Variations in the proportion of adults vs. juveniles of all species captured at CFMS during fall migration were examined. These data are being used in a manuscript entitled "An evaluation of autumn mist-netting data for monitoring songbird populations in interior Alaska", in prep, that examines molt and migration strategies of songbirds migrating through CFMS in the fall;
- b. Mean spring and fall passage dates for all species at CFMS are being calculated; analyses are being updated to include spring 2008 data. These findings were presented at the Alaska Bird Conference in March and updated analyses will be presented at the upcoming AOU meeting in August;
- c. Inter-annual and long-term trends in abundance and capture rates for all species caught at CFMS during both spring and fall seasons are analyzed for both the spring and fall reports. These reports have been submitted to ADF&G and are also available on the ABO website;
- d. CFMS was operated for the spring and fall banding seasons in 2007 and during the spring banding season in 2008;
- e. Weather data for the spring and fall banding periods has been compiled and used in analyses of both arrival and departure dates. Eric Stevens from the Geophysical Institute at UAF was kind enough to provide those data from the airport weather station;
- f. An annual progress report was submitted to ADF&G in August 2007;
- g. The CFMS and Tok banding data were not pooled with the Camp Denali banding data due to differences in protocols. Camp Denali operated on a compressed fall banding schedule and did not operate in 2007 and 2008. The data will be used in the future to build an argument supporting a network of migration stations rather than stand-alone stations.
- h. Weather variables used to examine differences in capture rates include daily maximum and minimum temperature, average wind speed, daily precipitation, and barometric pressure.
- i. I have not yet looked at Breeding Bird Survey data from Alaska. Some routes are known to be suspect (as per the USGS website—most of the routes haven't been done long enough to be statistically rigorous). Once time allows, analysis of BBS routes in Alaska that are statistically rigorous will be compared with CFMS banding data.
- j. Results of the 16-years of banding at CFMS were presented as a paper at the Alaska Bird Conference in Fairbanks in March 2008, and a poster will be presented at the AOU meeting in Portland this August;



- k. Mean arrival dates of spring migrants are being updated to incorporate spring 2008 data. Mean May temperature and greenup dates for the area will be incorporated into these analyses, along with migration strategy (i.e. Long-distance vs. short-distance migrants);
- l. Spring banding continued and was completed 7 June 2008;
- m. The Migration Program Manager will meet with ABO's Scientific Advisory Council to set 2008-2010 research goals in the fall of 2008—after the completion of fall banding;
- n. Four manuscripts are in preparation and will be submitted for publication by the end of 2008. The first manuscript will address the quality of stopover habitat at CFMS. Data on recaptures (birds caught multiple times in the same year) will be summarized to examine changes in body mass during fall stopovers at CFMS. The second paper will focus on spring and fall departure rates and their correlation with weather events. Mean May temperature and greenup dates in Fairbanks from 1992-2008 may give some insight into the avian response to a changing climate. Molt and migration strategies of Alaska migrants will be addressed in the third manuscript. The patterns seen here at CFMS can be compared to those in the lower 48. The fourth paper will report the range expansion of several species into the interior of Alaska and then explain how landbird migration monitoring helps document these expansions that might have gone unnoticed for many years. Literature searches and analyses for these manuscripts are almost complete; writing will begin after the fall banding season.
- o. The final SWG report will be submitted to ADF&G by 1 August 2008.

## VI. PUBLICATIONS

Benson, A-M., B.A. Andres, W.N. Johnson, S. Savage, and S.M. Sharbaugh. 2006. Differential timing of Wilson's Warbler migration in Alaska. *Wilson Journal of Ornithology*. 118:547-551.

A PDF of this manuscript is attached.

Benson, A-M., S.L. Guers, and W.N. Johnson. In prep. An evaluation of autumn mist-netting data for monitoring songbird populations in interior Alaska. For submission to the *Journal of Wildlife Management* in fall of 2008.

A PDF of the draft manuscript is attached

Abstract for poster being presented at upcoming AOU conference in August 2008:

A SUMMARY OF 16 YEARS OF CONSTANT-EFFORT MIST-NETTING AT  
CREAMER'S FIELD MIGRATORY WATERFOWL REFUGE, FAIRBANKS, AK.  
Susan Guers; Alaska Bird Observatory, PO Box 80505, Fairbanks, AK 99708

Constant-effort mist netting, often in conjunction with other monitoring methods, can be used as a technique during migration to provide estimates of population trend, relative abundance, species composition, and productivity indices for various species. The Alaska Bird Observatory (ABO) has operated a constant-effort mist-netting station at Creamer's Field Migratory Waterfowl Refuge (64°50' N, 147°50' W) since 1992. ABO's Creamer's Field Migration Station (CFMS) is the northernmost migration-monitoring station in North America. To date, we have banded over 65,000 birds (new captures) representing

73 species. The top five species captured include: Yellow-rumped Warbler, Dark-eyed Junco, Orange-crowned Warbler, American Tree Sparrow and Lincoln's Sparrow. In conjunction with our migration study, ABO conducts several environmental education and outreach programs at CFMS. ABO has acquired an incredibly valuable data set through 16 years of consistent operation of CFMS—the longest running constant-effort mist-netting station in Alaska and northern Canada. We are analyzing these data to detect possible trends in songbird populations and timing of migration and relating these parameters to various environmental cues associated with climate change.

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