2013 Summary of Landbird Projects For Boreal Partners in Flight

November 2013

Compiled and lightly edited by Julie Hagelin for Boreal Partners in Flight. If you would like more information about these studies, please contact the individual(s) noted at the end of each project summary.

Visit the Alaska Landbird Resource Information System, the official website of Boreal Partners in Flight: http://alaska.usgs.gov/science/biology/bpif/index.php

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A NOTE FROM THE COMPILER

Welcome to the 2013 Boreal Partners in Flight (BPIF) summary of new and ongoing landbird projects in Alaska, as well as several reports from Canadian colleagues. Combined, it highlights the important work being conducted on landbirds and is intended to stimulate communication and collaboration among educators, researchers, and managers. This year's summary contains 37 reports, which detail a total of 58 projects led by more than 60 investigators, with data collected by hundreds more. The majority of projects were affiliated with government resource agencies (38 projects), followed by the private sector (7), academic institutions (7), and NGOs (6). Projects focused on a variety of topics encompassed by 3 general themes: survey and monitoring (34 projects), research (18), and education (6). This year's projects focused primarily on raptors (30 projects), followed by passerines (19), and grouse and ptarmigan (4). Multi-species survey and monitoring programs, such as the Alaska Landbird Monitoring Survey, comprised the remaining 5 projects. Investigations exhibited broad-scale coverage, from Southeast Alaska to the Brooks Range. The most projects were conducted in BCR 4 (17 projects), followed by BCR 3 (11) and BCR 5 (16), BCR 2 (9) and statewide (5). The only region not represented in 2013 project reports was BCR 1.

In addition to projects, 20 papers involving Alaskan landbirds were published in 2012–2013 by BPIF members or other scientists. These are compiled in Appendix 1. In contrast to last year, the majority of publications were on passerines (18 papers), one on ptarmigan, and one on the revised Alaska bird checklist. Six publications deal with passerine breeding behavior, ecology or physiology, including a multi-year study of McKay's Bunting on St. Matthew Island. This study is the only publication on landbirds from BCR1. Three papers investigated control mechanisms of migration in the Northern Wheatear, and 2 graduate theses were completed on the Rusty Blackbird.

An interesting highlight involves 2 remarkable recaptures of Alaska's smallest breeder, the Rufous Hummingbird. One bird, originally banded in Tallahassee Florida, was recaptured in Southcentral Alaska (Chenega Bay). This individual holds the record for the longest journey known for any hummingbird—more than 3,500 miles! A second bird was captured in southern Texas within ~45 days of fledging in Alaska, and was then recaptured in Chenega Bay the following summer. Combined, these 2 amazing events confirm a link between Southcentral Alaska and wintering grounds in southern states (or perhaps beyond!).

Finally, this year we welcome the opening of the Alaska Songbird Institute (ASI), based in Fairbanks. ASI's mission is to conserve Alaska's boreal songbirds through ecological education and research. ASI's initial projects include continuing the long-term songbird migration project at Creamer's Field Migratory Waterfowl Refuge, as well as breeding phenology studies of Tree Swallows and Violet Green Swallows. We look forward to ASI's contributions to education and research (www.aksongbird.org).

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AVIAN PROJECTS FOR KATMAI NATIONAL PARK, ALASKA 2013

Sherri Anderson, National Park Service, Katmai National Park

1) American Dipper Baseline Study

American Dippers have been shown to be great indicators of a stream or river habitat condition. No information is available at this time in the Katmai National Preserve (KNP) on this species. With the possibility of mining operations happening in close vicinity to KNP, the possibility of contamination to area rivers and streams exist. Having baseline data of dipper locations, population numbers, diet and current metal levels in dippers will give us vital information. The baseline information can be used to follow effects of the mining operations if they do begin and throughout the life time of the mine. This study allows KNP to be proactive and prepared to make future management decisions on protecting aquatic habitats in KNP.

The specific objectives of this study are to 1) locate and map American Dippers found on rivers and streams of KNP and record habitat descriptions, 2) determine diet of the species, and 3) gather baseline data of metal levels in the current dipper population.

The Moraine and Funnel Creek areas were surveyed during the week of 10–17 June. At that time 25 dippers were documented on the 2 rivers. One nest was located and feathers collected and sent to the lab for isotope and metal accumulation studies. Stream surveys will continue next 2 years to survey other rivers that may be affected by future mining operations.

2) Spruce Grouse Surveys

Hares (*Lepus spp*) are known to have an 8- to 11-year population cycle (Krebs et al. 1986). Studies have shown a correlation to the number of spruce grouse (*Falcipennis canadensis*) to the hare cycle (Boutin et al. 1995). The objectives of this study were to; calculate the number of spruce grouse and hare seen in visitor year, to compare previous year's data with current year's data to see if population sightings are changing and to monitor the populations for concerns. Counts were performed during the daily valley tour by a visitor volunteer, the interpretation ranger or the bus driver. The survey ended on 18 September and data has not been analyzed as of yet.

Literature Cited:

Boutin, S., C. J. Krebs, R. Boonstra, M. R. T. Dale, S. J. Hannon, K. Martin, A. R. E. Sinclair, J. N. M. Smith, R. Turkington, A. Blower, A. Byrom, F. I. Doyle, A. Hik, L. Hofer, A. Hubbs, T. Karrsels, D. L. Murray, V. Nams, M. O'Donoghue, C. Rohner, and S. Schweiger. 1995. Population changes of the vertebrate community during a snowshoe hare cycle in Canada's boreal forest. Oikos 74:69–80.

Krebs, L. B. 1986. Population fluctuations in small mammals of the Kluane region, Yukon Territory. Canadian Field-Naturalist 99:154–164.

3) Wildlife Observation Study

Katmai has a citizen science program that allows visitors to document wildlife observed while visiting the park. Both visitors and staff members fill out wildlife observation forms on species seen while traveling throughout the park. These observations are made outside any other survey protocol. The Study runs in conjunction with the federal fiscal year calendar. Avian species are

recorded the most often. When a rare sighting is reported natural resource staff try to verify the sighting. The 2013 study is still on going and data will be analyzed this winter.

4) BBS
We performed the Breeding Bird Survey on 26 June.

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RUFOUS HUMMINGBIRDS: PILOT BANDING PROJECT AND PLANT USE STUDY

Gwen Baluss, Tongass National Forest; Cheryl Carrothers, U.S. Forest Service Alaska Region

The Rufous Hummingbird (RUHU) breeding range is tied to northwestern temperate forests. The species has been identified by Partners in Flight as a priority for monitoring, research and management in Bird Conservation Region 5. Recent data from the Breeding Bird Survey and Alaska Landbird Monitoring System suggest possible population decline. Hummingbirds, as pollinators may be ecologically important to their habitat. Information about habitat and phenology could aid in designing forest restoration projects. The species, being both a long distance migrant and a nectivore, is intimately tied to plant phenology and thus could serve as an indicator of climate change. Because hummingbirds are conspicuous and watched by the public, research is aided by citizen science efforts and conservation education projects can easily be designed focusing on hummingbirds. Yet much remains to be learned about RUHU habits in Alaska.

The Tongass NF sought to fill basic information gaps about breeding season chronology for the RUHU in Southeast Alaska by establishing a banding program. No previous studies spanned an entire season in the region. We also sought RUHU foraging information with the help of the public.

During the 2013 season we banded Rufous Hummingbirds, adapting protocols developed by Rocky Point Bird Observatory (http://www.rpbo.org/hummingbirds.php) and the Hummingbird Monitoring Network (http://hummonnet.org) to Alaska's logistical challenges.

Two sites were established near Juneau: The Jensen-Olsen Arboretum (JOAR) and Juneau Community Garden (JCGA). Three commercial feeders were erected at each site in mid-April. Trapping began in late April. Starting as early as practicable in the morning birds were captured using 1–2 Hall traps for up to 5 hours. Speed of banding the birds was generally the limiting factor. However, if no birds visited the traps for 1.5 hours, trapping ceased for the day. Birds were tagged using standard hummingbird banding techniques, (http://academic.keystone.edu/jskinner/OperationRubythroat/HUMM_MAN.pdf).

Morphometric measures were taken (wing chord, culmen), and physical condition (fat, weight, external parasites, breeding condition of adult females) noted. Effort continued approximately every 2 weeks until early August when hummingbirds became scarce in the area (due to

migration). Sites were generally run on consecutive or within 2 days apart to allow comparison between the 2 sites. Days with gale force winds and temperatures below freezing were avoided for bird safety, but otherwise trapping was attempted in all weather conditions in order to learn if some conditions were more conductive to catching hummingbirds.

Additionally bird watchers were asked to observe RUHU feeding and note the plant species. The query was transmitted via a local birdwatchers chat group "Eaglechat" (http://groups.yahoo.com/neo/groups/Eaglechat/info) and pooled with some information gathered by Alaska Audubon in advance of the release of National Audubon's "Hummingbirds at Home" citizen science project.

Figure 1 illustrates birds trapped by date in both locations. In total we captured 40 adult males, 69 adult females, and 17 hatch year males, 12 hatch year females. There were few within-season recaptures: 4 females, all captured on May 7 at JCGA were recaptured at the same location later in the season; additionally, one of those was recovered about 2 miles away in August by a resident. Only 2 birds returned to a trap on the same day. The low numbers of recaptures suggest that hummingbirds may be more numerous and transient on the breeding grounds than would be assumed with visual counts.

By banding at regular intervals we documented the season's phenology and were able to compare the 2 sites. Using the birds caught per hour as a relative index of abundance, the captures show an interesting pattern (Fig. 1). Spikes of adult males and females were observed during different weeks, with males peaking much earlier at JOAR than JCGA; with an opposite pattern for females. The first young of the year were observed in late June, and we started capturing them on 1 July. Given the approximate number of days from egg to fledging in the literature (about 26 days), this result suggests that 1) most successfully nesting females began incubating in the first 3 weeks of June and 2) double clutching (having 2 sets of young in a single year) is highly unlikely in this region. Captures of adult females and hatch-year birds were steady until late July. No males were captured and few observed, after 2 July. Morphometric data will be further examined and compared with hummingbird banding sites throughout the RUHU range. Parasites were collected for further classification.

We hope to repeat at least a portion of this banding effort to determine the level of inter annual variation, and to learn if the differences in gender ratio between sites will be consistent even with greater sample size and further standardization of variables such as weather.

Observations were collected from birdwatchers to form a list of foraging observations (Table 1). These included the expected bright tubular native flowers, such as fireweed, but also willows were prominent for gleaning insects. In addition to standard garden and yard flowers, hummingbirds used invasive weeds hempnettle and foxglove.

This project was funded by the USFS Alaska Region. Additionally, volunteers contributed at least 80 hours helping with the stations and observations.

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Table 1. Summary of Rufous Hummingbird foraging observations.

Category	Plant Species
Native nectar sources	*Rubus spectabilis, Vaccinium alaskaense, Menziesia ferruginea, Aquilegia sp., Castilleja sp., Lupinus sp.*
Insect gleaning	Various native *Salix sp.*
Non-native nectar sources	*Galeopsis bifida, Digitalis purpurea*

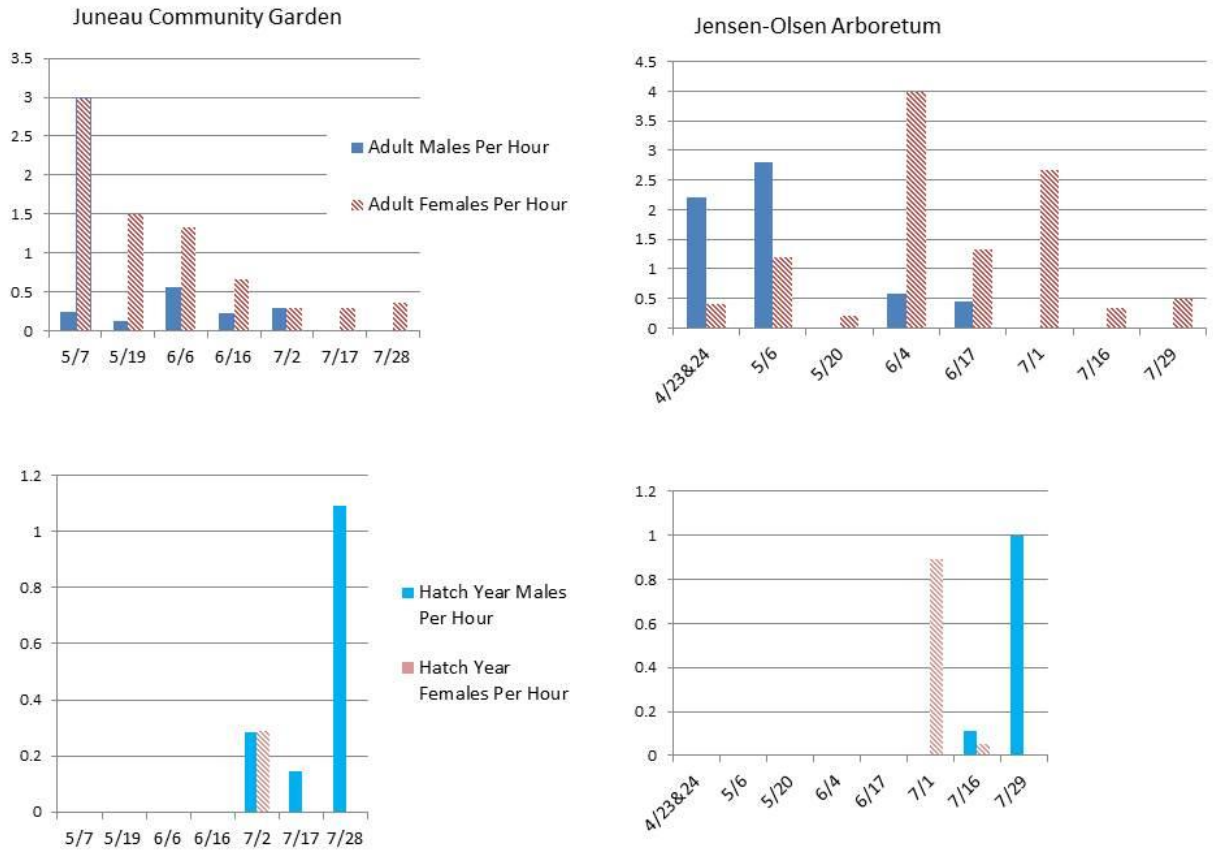

Figure 1. 2013 captures of Rufous Hummingbirds per hour by date.

SITKA WINTER BIRD OBSERVATION PROJECT

Gwen Baluss, Juneau Audubon Society, Matt Goff, sitkanature.org, Kitty LaBounty, University of Alaska Southeast, Scott Harris, Sitka Sound Science Center, Kent Bovee, Sitka School District

2013 will mark the second year studying common wintering birds in Sitka, Alaska: Chestnut-backed Chickadee, thought to be a year-round resident; Dark-eyed (Oregon) Junco, considered resident but may be a regional or altitudinal migrant; and Song Sparrow, likely a mix of resident and migrants from farther northwest. Our interests include 1) feeding site fidelity of local overwintering individuals, and 2) spatial patterns of local individuals throughout the year. Additional objectives are to 1) increase interest and knowledge of grade-school students about wintering songbirds, 2) provide a community-wide citizen-science opportunity to study birds and discuss the results, and 3) provide a forum to discuss anthropogenic causes of bird mortality.

In November 2012, 96 birds were color-banded using standard mist-netting and banding protocols at 3 sites. Citizens reported their observations and entered them into a spatial database. Local high school student Naquoia Bautista compiled the first 230 observations in April and reported her findings for a Science Mentorship Program. As expected, based on studies by Puget Sound Bird Observatory, re-sightings were almost entirely within a mile of the banding locations, despite efforts to locate birds farther afield.

After 1 May, only a color-marked chickadee was reported on 29 May. No other banded birds appeared to be resident. However, multiple color-marked juncos returned to Sitka starting in September. An interesting and unexpected result was the high proportion of sparrows that returned. Two of the 4 color-marked Song Sparrows returned in September (Figs. 1–2). While we only banded a single White-crowned Sparrow and 2 Golden-crowned Sparrows, a banded bird of each species was observed near a banding location this fall.

We plan more banding in late November 2013. Students will again be recruited for participation in the study.

This project is primarily an educational endeavor, but may yield results of greater ornithological interest.

Local websites for info, results and reporting observations
http://wiki.seaknature.org/SBBP_Overview;
http://sitkawild.org/2012/11/have-you-seen-this-bird/;
http://wiki.seaknature.org/w/index.php?title=Category:SBBP_observation&pagefrom=SBBP+201#mw-pages

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Figure 1. This Oregon Junco, pictured as a hatch year last fall, returned this September.

Figure 2. A dark Yakutat or Kenai race Song Sparrow showed winter site fidelity to Sitka.

PEREGRINES AND CLIFFS WITH "NO LEGS"

Peter Bente, Alaska Department of Fish and Game

Aerial raptor surveys in western and northwestern Alaska documented an increased abundance of Peregrine Falcons on the Norton Sound (NS) coastline in July 2012 followed by increased occupancy on the Seward Peninsula (SP) and Northwest Alaska (NWAK) in June–July 2013. In contrast, Rough-legged Hawks were found to have average abundance in NS and SP survey areas in 2012 compared to a near absence of birds in SP and NWAK areas in 2013. Even though rough-leg occupancy is highly variable, the high proportion of single birds, lack of pairs, and zero productivity observed in 2013 is remarkable and likely the lowest on record for broad regions of western Alaska. Other cliff-nesting species in the same zones, Gyrfalcon, Golden Eagle, Common Raven, showed occupancy at 20–30% of typical levels, along with low productivity, making 2013 a poor year for most species except peregrines. Resident species and early migrants experienced harsh winter conditions extending into the early nesting season likely causing failures. Late migrants, e.g., peregrines, seemed to miss the harsh weather and may have had less competition to allow them to be more successful.

Detailed data for 2012–2013 are summarized by survey location, below:

Norton Sound Coastline Summary (July 2012): Aerial surveys of the Norton Sound coastline to visit previously documented Peregrine Falcon nesting locations were completed using a Robertson R-44 helicopter during 11–13 July 2012. Two observers recorded occupancy information at 188 previously recorded sites (all raptor species) during 17.4 hr of flight while navigating along 525 miles of coastal cliff habitat. The survey covered there area from Wales to St. Michael, Alaska. Of the 188 locations to be inventoried, 79% were occupied by raptors (n = 148), 14% were not occupied (n = 27), and 7% were not checked during the survey (n = 13). The occupancy rate is skewed high because the survey route focused on previously occupied locations and did not include searches in suitable (adjacent) habitat. Bird species observed at occupied locations included:

Bald Eagle: 3 single* adults, 3 total locations;
Common Raven: 10 singles, 3 failed pairs**, 30 successful pairs***, 43 total locations
Golden Eagle: 8 singles, 1 failed pairs, 3 successful pairs, 12 total locations;
Gyrfalcon: 2 singles, 1 failed pairs, 3 successful pairs, 6 total locations;
Merlin: 1 successful pair, 1 total locations;
Osprey: 1 single, 1 total location;
Peregrine Falcon: 36 singles, 8 failed pairs, 15 successful pairs, 59 total locations;
Rough-legged Hawk: 15 singles, 1 failed pairs, 13 successful pair, 29 total locations;
Short-eared Owl: 1 single; 1 total location

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* single = no evidence of nest or mate;
** failed pair = nest with no evidence of eggs or young;
*** successful pair = nest with incubating or brooding adult, or fledged young.

Seward Peninsula Early Eagle Summary (May 2012): Species list currently in preparation.

Seward Peninsula Comprehensive Summary (June 2012): Species list currently in preparation.

Seward Peninsula Early Eagle Summary (May 2013): Aerial surveys of 192 raptor nesting locations were completed using a Robertson R-44 helicopter during 25–26 May 2013. Two observers recorded occupancy information at a subsample of previously recorded Golden Eagle and Gyrfalcon sites during 7.8 hr of flight while navigating along GPS waypoint route lines. Raptors occupied 34% of the surveyed locations (*n* = 65). Of 127 unoccupied locations, 41% were sticknests at cliffs (*n* = 79), 25% were cliffs with evidence of raptor use (*n* = 48). Bird species observed at occupied locations included:

Common Raven: 3 singles*, 0 failed pairs**, 5 successful pairs***, 16 total locations
Golden Eagle: 4 singles, 4 failed pairs, 3 successful pairs, 11 total locations;
Gyrfalcon: 4 singles, 3 failed pairs, 10 successful pairs, 17 total locations;
Merlin: 1 single, 1 total location;
Northern Harrier: 3 singles in flight, 3 total observations;
Peregrine Falcon: 3 singles, 1 failed pair, 4 total locations;
Rough-legged Hawk: 14 singles, 6 failed pairs, 20 total locations;
Short-eared Owl: 1 single; 1 total location

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* single = no evidence of nest or mate;
** failed pair = nest with no evidence of eggs or young;
*** successful pair = nest with incubating or brooding adult, or fledged young.

Seward Peninsula Comprehensive Summary (June 2013): Aerial surveys of 644 raptor nesting locations were completed using a Robertson R-44 helicopter during 20–22 June 2013. Two observers recorded occupancy information at previously recorded sites during 19.2 hr of flight while navigating along GPS waypoint route lines. Raptors occupied 19% of the surveyed locations (*n* = 125). Of 519 unoccupied locations, 40% were sticknests at cliffs (*n* = 258), 33% were cliffs with evidence of raptor use (*n* = 214), 3% were in sticknests in trees (*n* = 21), and 4% were man-made structures (*n* = 25). Bird species observed at occupied locations include:

Bald Eagle: 1 single* adult, 1 total location
Canada Goose: 3 singles, 5 pairs (incubating), 8 total locations;
Common Raven: 2 singles, 5 failed pairs**, 9 successful pairs***, 16 total locations
Golden Eagle: 8 singles, 7 failed pairs, 6 successful pairs, 21 total locations;
Glaucous Gull: 2 pairs (incubating), 2 total locations;
Gyrfalcon: 4 singles, 5 failed pairs, 18 successful pairs, 27 total locations;
Merlin: 3 singles, 3 total locations;
Northern Goshawk: 1 successful pairs, 1 total location;
Osprey: 1 failed pair, 1 total location;
Peregrine Falcon: 5 singles, 6 successful pairs, 11 total locations;
Rough-legged Hawk: 13 singles, 8 failed pairs, 2 successful pair, 23 total locations;

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* single = no evidence of nest or mate;
** failed pair = nest with no evidence of eggs or young;
*** successful pair = nest with incubating or brooding adult, or fledged young.

Northwest Alaska Comprehensive Summary (July 2013): Species list currently in preparation.

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CITIZEN SCIENCE MONITORING OF NESTING SWALLOWS IN FAIRBANKS, ALASKA

Tricia Blake and April Harding Scurr, Alaska Songbird Institute

There is growing evidence to suggest widespread population decline of aerial insectivores in North America, with particular concern for northern ecosystems and long distance migrants. This was paramount in the Alaska Songbird Institute's decision to adopt a long-term study of nesting Tree Swallows (*Tachycineta bicolor)* at Creamer's Field Migratory Waterfowl Refuge in 2013. The Alaska Songbird Institute is a nonprofit based in Fairbanks whose mission is to conserve Alaska boreal songbirds through ecological education and research.

The project was founded in 1999 and currently includes 102 artificial nesting boxes distributed throughout 180 acres of open, cultivated fields. The project is rooted in educational objectives, and has provided an opportunity for youth to participate in scientific research and learn about avian ecology and conservation for many years. In 2013, 16 youth ages 10–16 volunteered over 750 hours on the project. High school students conducted individual projects and presented their work at the Tanana Valley Sandhill Crane Festival in August. Youth assisted with: monitoring nest chronology, banding adults and chicks, recording chick growth rates, and monitoring the abundance of aerial insects throughout the season. In addition, HOBO data loggers were used to monitor incubation temperature on a subset of nests as part of a collaboration with Becky Windsor and Dan Ardia from *Golondrinas de las Americas*, and 14 geolocators were deployed in partnership with Dr. David Bradley of Bird Studies Canada and the University of Guelph.

Preliminary 2013 results suggest a decrease in numbers, and only a slight change in nest chronology, despite the arrival of the first Tree Swallows being 11 days past the mean for the refuge. The overall number of nesting pairs on the refuge was down 25%, although a decrease in breeding pairs was not observed at other Fairbanks sites.

In subsequent years we will continue efforts to connect and collaborate with research and monitoring efforts of *Tachycineta* species in Alaska. This includes sites at the University of Alaska, Fairbanks, new sites in the Anchorage area, as well as developing a mechanism whereby citizens throughout Alaska may contribute standardized data from nest boxes located around their homes and schools.

This project was funded by the Skaggs Foundation, Melinda Gray Ardia Environmental Fund, USFWS Connecting People with Nature Program, BP, Flint Hills Resources, and donations from individuals to the Alaska Songbird Institute. We are also grateful for the support of Julie Hagelin, Alaska Department of Fish and Game, Becky Windsor and Dan Ardia, *Golondrinas de las Americas,* Audrey Taylor, University of Alaska, Anchorage, Steve Matsuoka, U.S. Fish and Wildlife Service, David Bradley, Bird Studies Canada and University of Guelph, and many others. Their support made this project possible. Please visit www.aksongbird.org for more details on this project and the Alaska Songbird Institute.

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ACTIVITIES OF THE WILDLIFE DIVERSITY PROGRAM, TRAVIS BOOMS AND CHRIS BARGER, IN INTERIOR, WESTERN, AND NORTHERN ALASKA

Travis Booms and Chris Barger, Alaska Department of Fish and Game

We conducted 7 avian research or conservation projects in 2013.

1) Golden Eagle Migration Study, Pilot Season:
In coordination with Steve Lewis (USFWS), we tested Golden Eagle capture methods during spring migration near Gunsight Mountain, Alaska. No eagles were caught but we learned a lot and are modifying plans for 2014 when we hope to deploy 15 satellite transmitters on adult Golden Eagles.

2) Gray-headed Chickadee Surveys
We conducted 2 surveys (one in April, one in July) of potential Gray-headed Chickadee habitat in the Arctic National Wildlife Refuge. One pair was detected but no sign of breeding was present. We will continue to conduct surveys for this species in northern Alaska in future years to collect basic biological data on this little-studied species and to attempt to locate a population of sufficient size to conduct a focused research project.

3) Boreal Owl Nest Box Monitoring
We continued a long-term effort to monitor Boreal Owl nest boxes (approx. 100) in the Fairbanks area. Occupancy was 16%, which is on the low end of we've seen previously. Nestling growth and development and adult provisioning behaviors are being studied in detail by collaborators from UAF. Plans are to continue low-level monitoring of these boxes into the future.

4) Raptor Data Legacy Initiative
In coordination with Steve Lewis, USFWS, and the Alaska Raptor Group, we have contracted with Bob Ritchie (ABR) to summarize metadata on previous raptor research projects across the state. A manuscript has been drafted and is currently being reviewed before being submitted for publication. This manuscript is a result of the Long Term Raptor Research Symposium facilitated by the Alaska Raptor Group at the Alaska Bird Conference in 2010.

5) Gyrfalcon Survival and Dispersal
This was the last year of field sampling for this project, closing an 11-year data set of mark-recapture data on breeding Gyrfalcons on the Yukon-Kuskokwim Delta, Volcanoes Study Area. Over 400 feathers were collected and will be analyzed for individual movement using genetic mark-recapture approaches. Data will be analyzed and manuscripts prepared in future years.

6) Short-eared Owl Migration and Conservation
Jim Johnson (USFWS) is leading the effort to analyze and write-up movement data collected from 26 Short-eared Owls marked with satellite transmitters in previous years. T. Booms is providing support and assistance in manuscript preparation.

T. Booms continued to try to initiate a collaborative project studying the movements of Short-eared Owls in Montana and/or Alberta, where the majority of marked Short-eared Owls in the previous study spent at least some time. Efforts have not yet resulted in a project being formalized or funded.

T. Booms spearheaded an effort with 11 coauthors drafting a manuscript describing the current status and conservation of Short-eared Owls in North America. The manuscript received favorable reviews by JWM and a revised manuscript has been returned.

7) Golden Eagle Survival and Dispersal
T. Booms collected Golden Eagle molted feathers on the Seward Peninsula, in collaboration with Peter Bente, ADF&G Nome, to assess survival and dispersal of this species on the Seward Peninsula. Occupancy and productivity was low, but over 600 feathers were collected.

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LANDBIRD UPDATE FROM THE CHUGACH AND TONGASS NATIONAL FORESTS

Cheryl Carrothers, Erin Cooper, Jessica Ilse U.S. Forest Service

MONITORING:

BBS Routes

Chugach National Forest: Two BBS routes were completed across the Forest. The Hope breeding bird survey route #216 was completed on the Kenai Peninsula. The Cordova breeding bird survey route # 050 was completed in the Cordova Area.

Tongass National Forest: USFS personnel continued to count routes at Yakutat, Mitkof Island, Stikine, Prince of Wales Island and Hyder. USFS coordinates when requested with volunteers, other agencies and non-profits for the remaining routes within Southeast Alaska.

Alaska Landbird Monitoring Survey (ALMS)—Region-wide participation

Chugach National Forest: This was the ninth year of implementing this point count protocol on the Chugach NF. Three ALMS surveys were planned this year on the Chugach as a whole (East Creek, Bettles Bay and Kayak Island). Three blocks were surveyed with visits to all accessible points in 2 of the blocks (East Creek and Bettles Bay). On Kayak Island, persistent fog at higher elevations prevented surveys at over half the points. Personnel from both zones contributed. All are within Bird Conservation Region 5. Data were compiled and sent to the USGS Alaska Science Center for future analysis.

Tongass National Forest: This was the eleventh year of implementing this protocol. The common birds continue to be cataloged in a rigorous manner, and unusual birds, such as owls, documented for general distributional information. Nine ALMS blocks were planned to be visited. Eight grids were successfully counted with visits to nearly all accessible points (Juneau RD – Windfall Lake, Lemon Creek, Mansfield Peninsula and Ford's Terror; Petersburg RD – Kupreanof Island Tunehean Creek; Sitka RD – Sitkoh Lake; Thorne Bay RD- Tuxekan Island; Yakutat RD- West Fork Situk.) Staff from 5 Ranger Districts contributed. One community volunteer from Juneau and 2 Student Conservation Association volunteers assisted as field partners. All GPS points were collated into a GIS map to assist with re-locating the points in future years and conducting landscape level analysis. Photographs are also on file for each point. Point count data was compiled, entered into the Microsoft Access database designed specifically for this project, and will be sent to the USGS Alaska Science Center.

Northern Goshawk Nest Monitoring

Chugach National Forest: Monitored 2 northern goshawk nests throughout the nesting season to record the local goshawk nesting chronology timeline. Kenai Peninsula Zone staff and one volunteer contributed to this effort.

EDUCATION/OUTREACH:

International Migratory Bird Day: USFS personnel staffed a booth to teach Binoculars 101 and how to identify birds by sounds at Potter's Marsh. Juneau Ranger District offered songbird banding demonstration and bird walks in partnership with Juneau Audubon Society.

Yakutat Tern Festival: Bird walks, banding, lectures, native culture and art exhibits and community based tourism were part of a successful second annual event. While terns are the theme, all Yakutat birds are celebrated.

Stikine River Birding Festival, Wrangell: Wrangell Ranger District contributes to the event annually to celebrate spring migration, and the local and international importance of the Stikine River Delta to people and wildlife.

Alaska Hummingbird Festival, Ketchikan: Ketchikan and the USFS Southeast Alaska Discovery Center host this annual a month-long celebration with bird-themed activities that include guided bird hikes, a juried art contest, film presentations, arts and crafts workshops, and kids' programs.

Angoon School District Environment Education Program: The third annual event included songbird banding demonstrations open to by every student and teacher in Angoon. Materials were provided to interested teachers to include for their science curricula.

Crystal Lake Day Camp, Juneau: Summer nature camp for school-aged kids features bird identification activities including bird banding demonstration.

Prince of Wales Island Visitors' Summit: Forest Service personnel delivered wildlife talks and led bird walks for conference attendees.

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HABITAT ASSOCIATIONS FOR BREEDING SONGBIRDS IN YUKON'S TINTINA TRENCH

Hilary A. Cooke and Lila Tauzer, Wildlife Conservation Society Canada

The Tintina Trench is a straight northwest-trending valley running 680 km through central Yukon, Canada and ranging from 5 to 22 km in width. The Trench is commonly described as an important migratory flyway for sandhill cranes, tundra swans, raptors, and other avian species. Little is known about songbird use of the Trench during the breeding season. At the southeast end of the Trench, diverse valley-bottom habitats are accessible from the Robert Campbell Highway (RCH) within the Traditional Territory of the Ross River Dena Council (RRDC) First Nation. The region is still largely intact with a small human population and access limited to small roads and trails off the gravel RCH. However, there are significant mineral resource interests within the RRDC Traditional Territory and potential for increased development activity along this transportation corridor. In response, the RRDC is developing a land use plan to manage resource development activities and protect areas of ecological and cultural value. In support of this plan WCS Canada developed a map of important habitats for breeding birds based on expert-based ratings of the suitability of habitat types in the region. In 2013 we initiated a field study of breeding songbird communities in the Trench's valley-bottom habitats along the RCH. The goal of the project is to field test the habitat suitability ratings and increase our knowledge of bird-habitat associations in the region.

Study sites were selected to include several broad habitat types occurring within the low-elevation forested zone of the Trench's valley bottom: wetland treed, wetland shrub, floodplain coniferous, floodplain shrub, upland coniferous, and upland shrub. Five study sites were located along a 120-km section between Faro and Finlayson Lake. At each study site, we created a 400-m grid with a random starting point and selected sampling points located at least 200-m from the road. We sampled a total of 221 points (18–69 per site); each point will be treated as an independent sampling unit with site and geographic gradient effects accounted for statistically. Standardized 10-min point count surveys were conducted twice at each point at least 10 days apart in June. Observations were recorded within 4 distance bands: ≤25 m, 25–50 m, 50–100 m, and 100–200 m. At each point we also conducted a field assessment to classify habitat type: we collected qualitative data on ground, herbaceous, shrub, and tree cover, as well as dominant vegetation structural stage, canopy cover, relative soil moisture, occurrence of water, site aspect and slope, and evidence of fire or beaver activity.

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MONITORING AVIAN PRODUCTIVITY AND SURVIVORSHIP (MAPS) ON KODIAK ISLAND, ALASKA

Robin Corcoran, U.S. Fish and Wildlife Service; and Cindy Trussell, Kodiak College

Summer 2013 marked the fourth season of the Kodiak National Wildlife Refuges' Monitoring Avian Productivity and Survivorship (MAPS) Program at Refuge headquarters on the Buskin River State Recreation Area, Kodiak, Alaska. This season, Refuge employees and volunteers banded 180 birds representing 15 species, and recaptured 58 birds including 20 birds banded in previous years. In general, across all seasons, resident (nonmigratory) and short distant migrants had higher capture and return rates and higher productivity compared to long-distance migrants. Cooperators from the community included Cindy Trussell, biology professor at Kodiak College, and Rich MacIntosh, a retired biologist with NOAA Fisheries and local bird expert. Despite the early morning hours working before sunrise to set up nets, each summer approximately 30 volunteers from the Kodiak community participate, including several enthusiastic youngsters.

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Table 1. Summary of mist net captures at the Kodiak Refuge Monitoring Avian Productivity and Survivorship (MAPS) site on the Buskin River State Recreation Area in summer 2010 to 2013.

	Year						
Species	**2010**	**2011**	**2012**	**2013**	**Total**	**No Recaptured Between Years**	**Mean Hatch Year to Adult Ratio**
Fox Sparrow	46	44	33	48	171	15	1.3
Hermit Thrush	52	41	47	30	170	17	1.8
Wilson's Warbler	76	26	29	16	147	11	0.2
Yellow Warbler	29	15	26	23	93	9	0.2
Pacific Wren	16	24	0	1	41	1	0.3
Varied Thrush	3	12	9	12	36	2	1.2
Black-capped Chickadee	13	5	5	10	33	2	2.4
Golden-crowned Kinglet	3	27	0	0	30		1.0
Pine Siskin	1	12	3	12	28		
Pine Grosbeak	1	5	4	10	20	2	
Orange-crowned Warbler	7	3	2	2	14		
Red-breasted Nuthatch	2	2	2	7	13	1	
Golden-crowned Sparrow	6	0	1	2	9		
Myrtle Warbler	1	0	2	2	5		
Brown Creeper	0	0	1	4	5	1	
Song Sparrow	2	0	0	0	2		
Common Redpoll	0	1	0	0	1		
Downy Woodpecker	1	0	0	0	1		
Three-toed Woodpecker	0	0	0	1	1		
TOTALS	**259**	**217**	**164**	**180**	**820**	**61**	

BREEDING ECOLOGY OF SMITH'S LONGSPURS IN NORTHERN ALASKA

Heather Craig, Department of Biology and Wildlife, University of Alaska Fairbanks; Abby Powell, U.S. Geological Survey, Alaska Cooperative Fish and Wildlife Research Unit, University of Alaska Fairbanks

During summer 2013 we continued to investigate the annual survival and local breeding requirements of Smith's Longspurs at 2 study sites in northern Alaska (Atigun Gorge and Slope Mountain). This was the seventh and final year of breeding ecology research on Smith's Longspurs in Atigun Gorge (and the third year of research at Slope Mountain).

Field crews located and monitored 74 nests during the 2013 season. Of these nests, for which fate was known, 11 out of 65 (79.6%) fledged successfully. Throughout the field season we also resighted 50 previously color-banded Smith's Longspurs in addition to banding 270 new birds (57 adults and 213 nestlings). To date we have banded over 900 (n = 912) Smith's Longspurs in the area.

The final component to our 2013 field research, involved deploying 22 light-level geolocators on male Smith's Longpsurs captured in Atigun Gorge. We will return to the area in June 2014 in order to retrieve the geolocator units deployed during the previous summer.

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ANNUAL UPDATE: GULF OF ALASKA AUTUMN PASSERINE MIGRATION

Lucas DeCicco, Nicholas Hajdukovich, Jim Johnson, Steve Matsuoka, Rebecca Windsor, and Charles Wright, Migratory Bird Management, U.S. Fish and Wildlife Service

Overview: In autumn 2013 we monitored passerine migration for the third consecutive year on Middleton Island, Gulf of Alaska. We implemented this project in 2011 to investigate trans-Gulf of Alaska migration in passerines with the primary goals to 1) document an over-water migration across the Gulf of Alaska, 2) determine the magnitude of migration in terms of number of birds and species composition, and 3) quantify the timing of migration and how it relates to weather. This route is unique along the Pacific Coast of North America in being the only large over-water migratory path used by passerines.

Summary of 2013 season: We operated an array of 13 mist-nets from 18 August to 28 September 2013, we also conducted daily surveys of birds in representative habitats each day. Our planned departure date was 15 October but our stay was abruptly terminated on 1 October by the government shutdown. During our 24 days of banding we captured 3,761 birds of 35 species (Table 1) including 39 recaptures from previous years (4 banded in 2011 and 35 banded in

2012). We observed comparatively large numbers of migrants in 2013. Our average capture rate of 301 birds per 100 net-hours in 2013 was 2.9- and 1.7-times that in 2012 (103 birds/100 net-hours) and 2011 (275 birds/100 net-hours), respectively (Table 1). We observed several large pulses of migratory movement; most notable were an influx of birds dominated by Yellow Warblers during 24–26 August and a massive fallout of birds dominated by Golden-crowned Sparrows and Hermit and Varied thrushes. These major movements occurred after the passing of low-pressure systems when north winds and minimal cloud-cover persisted.

Passerine use of a trans-Gulf of Alaska migration route: Taken together, our compilation of information from banding and field surveys provide evidence of a migration of passerines and many other avian taxa across the Gulf of Alaska in autumn. Our evidence to back this claim include the following. Age composition; with about 10% adult in regular migrants, this suggests that the over-water route is regularly used and not solely off-shore drift of miss-oriented juveniles. Higher fat stores than on mainland sites (e.g., Yakutat), this strongly suggests that these birds on Middleton are preparing for a long-distance flight. Response to weather; with birds migrating over the Gulf when winds and sky conditions are favorable for migration and not during poor conditions conducive of moving birds off-course. Overall large numbers of migrants; corroborated by field observations and our very high capture rate.

Future directions: We will conduct additional analyses on capture and radar data to better understand the timing, magnitude, and species composition of trans-Gulf of Alaska migration and to characterize the governing effects of weather on this unique migratory system.

Acknowledgments: We thank the Federal Aviation Administration, Scott Hatch (ISRC), James Levison, Francisca Gutierrez (USFWS), and Alaska Air Transit for logistical and field support.

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Table 1. Summary of a subset of passerines captured during autumn on Middleton Island over the past 3 seasons.

	Total #			Rate*			% adult		
Species	**2011**	**2012**	**2013**	**2011**	**2012**	**2013**	**2011**	**2012**	**2013**
Downy Woodpecker	3	0	1	0.3	0.0	0.1	33	N/A	0
Northern Flicker	7	2	2	0.7	0.1	0.1	29	50	0
Olive-sided Flycatcher	0	6	0	0.0	0.2	0.0	0	0	N/A
Western Wood-Pewee	0	7	8	0.0	0.3	0.6	0	0	0
Alder Flycatcher	2	15	16	0.2	0.6	1.0	0	0	0
Brown Creeper	20	0	0	2.0	0.0	0.0	5	N/A	N/A
Pacific Wren	51	31	82	5.2	1.2	8.6	8	19	6
Golden-crowned Kinglet	57	0	1	5.8	0.0	0.1	4	N/A	0
Ruby-crowned Kinglet	8	49	18	0.8	1.9	1.0	0	6	11
Gray-cheeked Thrush	5	6	5	0.5	0.2	0.4	80	17	40
Swainson's Thrush	2	2	5	0.2	0.1	0.4	0	50	40
Hermit Thrush	101	149	345	10.3	5.9	25.4	13	11	16
American Robin	7	14	1	0.7	0.6	0.1	0	0	0
Varied Thrush	40	29	63	4.1	1.1	4.6	10	10	6
Northern Waterthrush	2	3	4	0.2	0.1	0.3	0	0	0

Species	Total #			Rate*			% adult		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Tennessee Warbler	1	1	2	0.1	0.0	0.1	0	0	0
Orange-crowned Warbler	41	59	212	4.2	2.3	15.5	2	8	6
Yellow Warbler	496	432	1150	50.8	17.0	85.5	9	11	8
Blackpoll Warbler	1	1	3	0.1	0.0	0.2	0	0	0
Yellow-rumped Warbler	42	14	7	4.3	0.6	0.5	10	0	29
Townsend's Warbler	16	17	36	1.6	0.7	2.8	0	0	0
Wilson's Warbler	39	26	10	4.0	1.0	0.8	0	8	0
Savannah Sparrow	15	86	38	1.5	3.4	2.7	7	21	16
Fox Sparrow	531	1368	1401	54.4	53.8	124.2	13	0	7
Song Sparrow	3	3	1	0.3	0.1	0.1	33	0	0
Lincoln's Sparrow	40	46	42	4.1	1.8	3.2	3	0	2
White-crowned Sparrow	8	11	7	0.8	0.4	0.5	0	0	0
Golden-crowned Sparrow	111	177	283	11.4	7.0	21.2	5	2	8
Dark-eyed Junco	31	26	9	3.2	1.0	0.6	0	4	11
White-winged Crossbill	1	3	0	0.1	0.1	0.0	0	0	N/A
Common Redpoll	4	3	0	0.4	0.1	0.0	0	0	N/A
Pine Siskin	10	26	1	1.0	1.0	0.1	40	58	0
Totals:	1695	2612	3761	175	103	301			

* Rate presented in birds per 100 net-hours.

PRELIMINARY REPORT: OLIVE-SIDED FLYCATCHER MIGRATION AND BREEDING BIOLOGY

Julie C. Hagelin, Alaska Department of Fish and Game, Aleya Brinkman, Fort Wainwright Wildlife, Jim Johnson, Steve Matsuoka, and Luke DeCicco and Nicholas Hajdukovich, Migratory Bird Management, U.S. Fish and Wildlife Service

Overview:

During 2013 we began a multi-year study of Olive-sided Flycatchers (*Contopus cooperi*). A primary research goal is to identify migratory movements and key wintering areas of Alaska breeders using geolocators, in order to inform conservation efforts. Other research goals are to 1) sample aerial insects at breeding sites, as food availability is hypothesized to limit reproductive success (Altman and Sallabanks 2012), 2) characterize nest chronology and success, and 3) re-survey historical breeding sites from Wright (1997) to document any changes in bird occupancy.

Summary of 2013 breeding season:

Geolocators: We tested a new geolocator harness material (rubberized O-ring) and refined our trapping methods (decoys + playback, passive mist-netting near nests). In total we captured and banded 10 adults at eight nest sites (n = 4 nests each in Fairbanks and Anchorage). One adult from each nest was fitted with a geolocator (6 male, 2 female). Wright (1997) indicates ~60% of banded adults return to the same territories the following year. Provided 2013 birds do not experience adverse mortality, we will expand geolocator efforts next year, as well as increase our control (banded-only) population to better gauge the efficacy of the tracking method. We are also working with the American Bird Conservancy to facilitate geolocator deployment across the flycatcher's western range (western U.S. and Canada) where declines are most notable.

Insect data, nest chronology, historical site surveys: Aerial insects were collected at all nest sites and are currently being analyzed by the University of Alaska Museum of the North. Nest chronologies are summarized in Table 1, and indicate that breeding in Anchorage preceded Fairbanks by ~7–10 days. Chronology dates in Fairbanks were generally within ranges reported by Wright (1997) for central Alaska, but 2–4 days later for hatching and fledging. Each Fairbanks nest fledged 2–4 young; 3 of 4 Anchorage nests also fledged 2–4 young. Finally, we conducted a set of 3 10-minute point-counts during the peak male singing period at 9 historical breeding areas near Fairbanks (from Wright 1997). Our search yielded no singing males, despite very high detection probabilities (80–100% per point, Wright 1997) and covering a listening area of ~987ha per site. Given that the 2013 season was an unusually late and snowy spring, we plan to re-survey these sites again next season.

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Table 1. Nesting chronology of Olive-sided Flycatchers in Anchorage (n = 4 nests) and Fairbanks (n = 4 nests).

Nest Chronology	Mean Date (range)	Location
First egg laid	3 June (28 May–14 June*)	Anchorage
	13 June (05*–18June)	Fairbanks
Clutch size	4.3 eggs (4–5)	Anchorage
	3 eggs (2–4)	Fairbanks
Hatching	22 June (16 June–3 July)	Anchorage
	30 June (22 June*–4 July*)	Fairbanks
Fledging	12 July (6–21 July)	Anchorage
	20 July (12 July*–24 July)	Fairbanks

*Date back-calculated based on other data (e.g., no. eggs in nest, fledge date, etc.)

PLASMODIUM INFECTION IN BLACK-CAPPED CHICKADEES

Colleen Handel and Caroline Van Hemert, USGS Alaska Science Center; Laura Wilkinson and Ravinder Sehgal, San Francisco State University

In collaboration with researchers at San Francisco State University, we are investigating blood parasites in Black-capped Chickadees in Southcentral Alaska. Molecular analysis demonstrated that birds with beak deformities have significantly higher rates of infection with *Plasmodium*, suggesting an effect of host condition and immune response on susceptibility to infection. In addition, preliminary results indicate that local climatic factors, including summer temperatures and precipitation, are closely linked to prevalence. Future research will target the individual- and population-level impacts of *Plasmodium* infection in Black-capped Chickadees. With a

long-term dataset and continued monitoring of this resident species, we have a unique opportunity to measure survival and immune response across seasons and years. Given the potential for climate warming to alter the distribution and abundance of mosquito vectors, there is a growing need to evaluate the fitness consequences of infectious diseases such as avian malaria.

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2013 UPDATE ON THE ALASKA LANDBIRD MONITORING SURVEY (ALMS)

Colleen M. Handel, USGS Alaska Science Center, and multiple collaborators from Boreal Partners in Flight

During 2013, biologists conducted surveys at 514 points in 33 sampling blocks statewide during the eleventh year of the Alaska Landbird Monitoring Survey (ALMS) program. Survey effort has been fairly consistent over the years, with a mean annual effort of 524 points across 33 blocks since the inception of the program (Fig. 1). The current survey effort, however, is only about 60% of the target monitoring level of 50 blocks per year, or a total of 100 blocks repeated biennially. The ALMS program uses standardized distance-sampling techniques to survey breeding bird populations at 12–25 points within 10-km × 10-km blocks selected using a stratified random design of accessible areas across Alaska. The main purpose of the survey is to monitor long-term population trends of birds (primarily landbirds) in off-road areas as a complement to the roadside North American Breeding Bird Survey (BBS). Biologists are also encouraged to use the same sampling grids and standardized survey techniques to gather systematic inventory data.

Surveys conducted through ALMS, its predecessor the Off-road Breeding Bird Survey (ORBBS), and the roadside BBS now provide an impressive compilation of quantitative data on the abundance and distribution of birds throughout Alaska (Fig. 2). As of 2013, observers have conducted 5,757 ALMS surveys in 102 different blocks at 1,808 different points, with varying numbers of replications during the 11-year period (Fig. 3). Combined, ALMS and ORBBS surveys have documented about 200,000 detections of birds.

ALMS protocols are currently being peer-reviewed for incorporation into standardized monitoring programs for the network of National Wildlife Refuges across Alaska. Some of the data collected to date in Alaska are being analyzed in concert with avian point count data across boreal regions of Canada as part of the Boreal Avian Modelling project. The primary goal of this joint analysis is to use climatic niche modeling to project changes in distribution of landbirds that are likely to occur with predicted changes in climate. ALMS data collected across Tongass National Forest during the past decade are currently being analyzed to determine recent population trends, assess the effectiveness of monitoring Management Indicator Species, and document current patterns of landbird distribution relative to forest structure and management. During the upcoming winter, ALMS data collected on Alaska Peninsula/Becharof NWR will be analyzed jointly with similar point-count data from an inventory of montane-nesting birds across

3 National Parks in the Southwest Alaska Network to develop regional landscape-level models of avian distribution. Statewide, ALMS data continue to be analyzed to assess population trends and build habitat models for landbirds.

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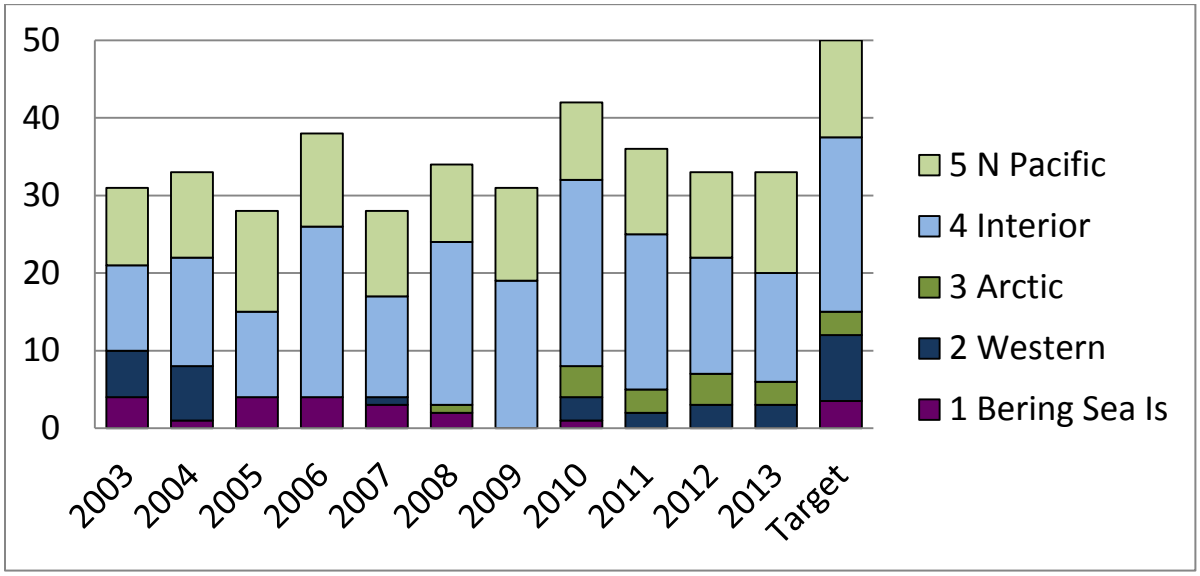

Figure 1. Number of ALMS blocks surveyed each year within the 5 Bird Conservation Regions in Alaska between 2003 and 2013.

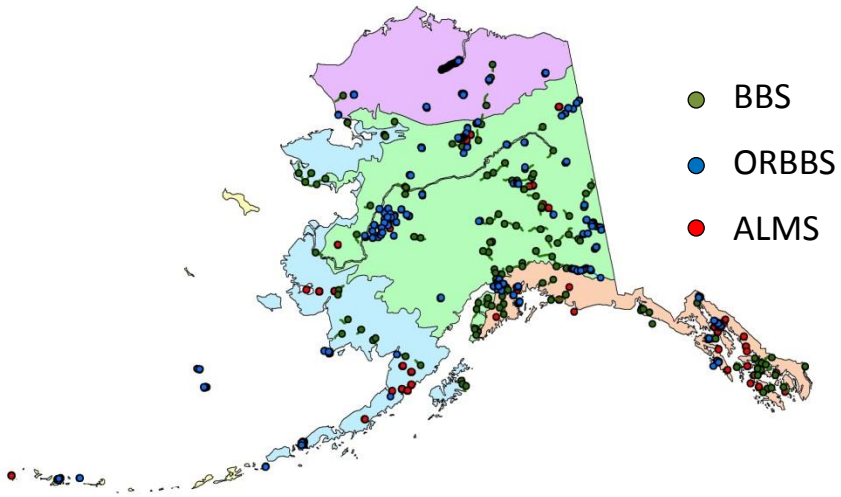

Figure 2. Locations of landbird surveys conducted as part of the roadside Breeding Bird Survey (BBS), Alaska Off-road Breeding Bird Survey (ORBBS), and Alaska Landbird Monitoring Survey (ALMS) in Alaska through 2011.

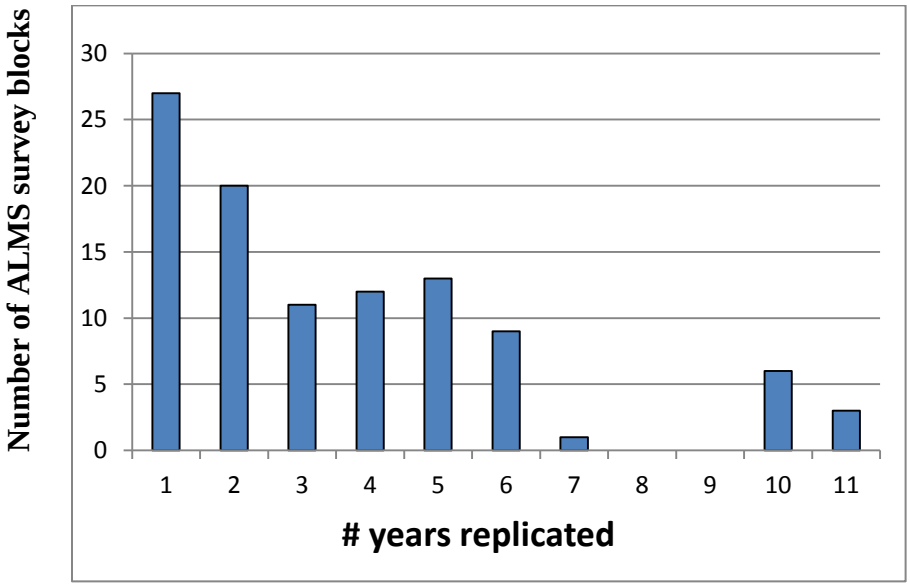

Figure 3. Number of ALMS blocks that have been surveyed 1–11 years between 2003 and 2013. The standard protocol is to replicate each block biennially (e.g., 5 times over a 10-year period), but some surveys have been replicated annually. Most blocks replicated during a single year represent those surveyed for inventory rather than monitoring purposes.

CREAMER'S FIELD MIGRATION STATION, 22 SEASONS AND COUNTING

April Harding Scurr and Tricia Blake, Alaska Songbird Institute

The Creamer's Field Migration Station (CFMS) in Fairbanks, Alaska, has examined songbird migration and ecology since 1991. In 2013 the program was adopted by the Alaska Songbird Institute, a nonprofit whose mission is the conservation of boreal songbirds through ecological education and research. CFMS was operated 8 August–30 September 2013, 5 days per week, 6 hours per day. We used 12 m and 6 m mist nets to passively capture songbirds on Creamer's Field Migratory Waterfowl Refuge. In general, new captures appeared to be much lower than average, although, it is important to consider decreased net hours due to limited funding and large amounts of rain in late August and September. Analysis will be conducted later this fall and winter. Pursuant to the dual mission of research and education, almost 1,200 students and teachers from the Fairbanks North Star Borough and the University of Alaska Fairbanks also visited the station to learn about research and conservation of Alaska's boreal birds. Contact the Alaska Songbird Institute (www.aksongbird.org) for further information.

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CORDOVA COMMUNITY OWL PROJECT: DETERMINING PRESENCE AND DISTRIBUTION OF NOCTURNAL OWLS IN SOUTHEAST PRINCE WILLIAM SOUND

Jillian Jablonski, U.S. Forest Service, Chugach National Forest

The Cordova area provides habitat for a diverse assortment of resident and migratory avian species, with eight different species of owls having been previously sighted in Cordova and the Copper River Delta. Nevertheless, relatively little data has been collected regarding the presence and distribution of the nocturnal owl species of this region. This project sought to establish baseline occupancy of nocturnal owls in the region surrounding Cordova, Alaska and to determine if the Barred Owl (*Strix varia*) had yet expanded its range north from Southeast to Southcentral Alaska. The target species for this survey were the Boreal Owl (*Aegolius funereus*), Western Screech Owl (*Megascops kennicottii*) and the Barred Owl.

The community of Cordova, Alaska is situated in the coastal temperate rainforest of southeast Prince William Sound, Alaska. To the east of Cordova lies the Copper River and its expansive delta, to the north are mountains and glaciers of the Chugach National Forest and to the south, the Gulf of Alaska.

The Cordova Community Owl Survey project protocol was developed to be comparable to the one used in Southeast Alaska by Kissling and Lewis (2009), as the landscape and weather conditions between the regions are similar. In our monitoring effort, point count surveys were

conducted along road transects from 15 March 2013–26 April 2013. The study area contains few roads, and all roads leading out from town were surveyed for owls, resulting in a total of 5 routes. Each point located on the routes was surveyed 3 times, once during each 2-week survey range: 15 March–29 March, 30 March–12 April, and 13 April–26 April. The survey methods used in this project were developed to increase call response probability. Each survey began with a one minute settling period, followed by a 2 minute silent listening period and a 10 minute broadcast calling period of male territorial calls.

In total, we conducted 71 point counts from 15 April–26 May 2013. Sixteen owl detections were logged, with 4 different species represented: Western Screech-owl, Great Horned Owl (*Bubo virginianus*), Boreal Owl and Northern Saw-whet Owl (*Aegolius acadicus*). No Barred Owls were detected during the surveys. Of all species recorded, Great Horned Owls were the most numerous, with 43.75% (7) of the 16 detections, even though their call was not broadcast. Western Screech-owls were detected on all 3 Power Creek Road surveys, for a total of 6 distinct detections. Northern Saw-whet Owls were detected twice, only in the first survey period 15 March–29 March. One Boreal Owl was detected on Copper River Highway across from Alaganik Slough Road, and observers were able to obtain a recording of its call.

This project was part of a larger effort in community outreach, and engaging local residents with wildlife they can hear and see throughout the area. Prior to the start of the surveys, an article regarding owl ecology and conservation was published in the Cordova Times and a public lecture was given about the species of owls inhabiting the region, to raise interest in owls and to recruit community volunteers. At the completion of the surveys, a community Owl Prowl was held to visit points of greatest owl activity. A group of 10 core volunteers participated in nighttime owl surveys, with additional residents providing information about owl sightings around town. This project successfully engaged the community in owl conservation and education, while also providing valuable data regarding the species inhabiting Cordova and the Copper River Delta. The data collected will be used to compare local occupancy changes in the future.

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UPDATE FROM THE MIGRATORY BIRD MANAGEMENT RAPTOR PROGRAM

Stephen B. Lewis, U.S. Fish and Wildlife Service, Migratory Bird Management

Project 1: Ecology of Peregrine Falcons and Bald Eagles in Icy Bay, Alaska: assessing raptor predation of Kittlitz's Murrelets: In conjunction with Michelle Kissling (USFWS – Ecological Services), I continued to monitor marked raptors in the Icy Bay area; no additional fieldwork was completed here in 2013. We have 3 Bald Eagles (*Haliaeetus leucocephalus*) with ARGOS/GPS

tags remaining on the air. These birds (2 males and 1 female) make up 2 neighboring breeding pairs in Icy Bay. Both pairs appeared to nest and maintain their breeding territories throughout the entire year. We are in the process of analyzing and writing up data from this project.

Project 2: Effects of Bald Eagle Nest Removal in Alaska: The objective of this study is to learn about the effects that removal of nests has on Bald Eagles in Alaska. Eagle nests can be removed when in the vicinity of an airport and when deemed to represent a risk to human safety. Over the course of this study, 11 Bald Eagles have been marked with ARGOS/GPS tags to track their movements after removal of their nest. To date, 8 eagles continue to be monitored. Movements vary from little movement away from the territory, to annual migration cycles to and from a wintering location, to movement away from the initial capture location and subsequent settling in a new area, to movement away from the capture area with continued wandering throughout the year. I continue to monitor these birds to determine long-term fate and am working on an annual report for this project.

Project 3: Assessing reproductive characteristics, movements, and survival of Alaskan Golden Eagles: This project has several parts in conjunction with Brian Millsap and Robert Murphy (USFWS Southwest Region), Carol McIntyre (National Park Service), Travis Booms and Chris Barger (ADF&G Wildlife Diversity Program), and Brian McCaffrey and Kristine Sowl (USFWS, Yukon Delta NWR). This project has 2 parts: 1) to learn about reproductive characteristics of Golden Eagles in the Kilbuck Mountains (see McCaffery et al. in this summary); and, 2) to capture eagles in Alaska to deploy ARGOS/GPS to learn about their movement and survival year-round. I attempted to capture Golden Eagles in various locations (Gunsight Pass/Sheep Mountain, Nome area, Kisaralik River, Alaska Range south of Tok) around the state with equal success (0 captures). While frustrating, I learned many lessons and have many ideas on how to adjust techniques for improved success in the future.

Project 4: Raptor Movements in Kenai Fjords NP, Alaska: This project was completed in conjunction with Laura Phillips (National Park Service). Building on information gained in Icy Bay on Peregrine Falcons and Bald Eagles, we set out to capture and mark several of each species in Kenai Fjords NP to examine their space use in relation to seabird populations in the area. We captured 3 Bald Eagles and deployed GPS tags on each; we were unable to capture any Peregrine Falcons this year. Two of the 4 eagles were monitored for the entire summer (2 tags failed within 1 month of deployment). We are debating an additional field effort during the nestling period to try to catch Peregrines during a time when they are more easily captured.

Project 5: Nutrient Movements from Salmon Streams: I assisted graduate student Rachel Wheat (U.C. – Santa Cruz) in her study of nutrient movement by eagles from the Chilkat River near Haines. This is part of her larger Ph.D. project documenting the use of salmon streams in the area by a suite of carnivores and subsequent nutrient cycling brought on by these animals. My part of this project involved capturing Bald Eagles and deploying GPS tags to document eagle movements from the Chilkat River eagle concentration that occurs each year in November. We are trying to understand cycling of marine nutrients into the terrestrial environment, potentially hundreds of miles from the coast via eagle movements.

Project 6: Bald Eagle Nesting Surveys in Southeast Alaska: I completed several small scale Bald Eagle nest surveys to inform potential management activities (usually potential development) in various areas of Southeast Alaska, including the Juneau area and the George Inlet area of Revillagigedo Island.

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UPDATE ON THE BOREAL AVIAN MODELLING PROJECT

Steve Matsuoka, U.S. Fish and Wildlife Service, Migratory Bird Management

Boreal Avian Modelling Project

The Boreal Avian Modelling Project (BAM) was founded in 2005 to compile and analyze avian point-count survey data from across boreal Canada and to use the knowledge gained to help conserve bird populations throughout this vast region (Cumming et al. 2010). In 2010, the program expanded to include boreal forest regions of Alaska, the Upper Midwest, and New England. BAM now includes data from approximately 190,000 point-count locations across North America's boreal forest region as defined by Brandt (2009). Analyzing these data is complicated because point-count survey protocols were not standardized across surveys throughout the region (Cumming et al. 2010). Thus, BAM has modified 2 existing models of avian detection rates—distance sampling and removal models—to estimate densities and population sizes from these heterogeneous data (Matsuoka et al. 2012, Cumming et al. 2013, Sólymos et al. 2013).

The BAM website (www.borealbirds.ca) includes a wealth of information on avian breeding densities by habitat type, maps of avian distribution, and recommendations on conducting point-count surveys. Much of the information is focused on boreal Canada, but information specific to Alaska will become available in the coming years. Other upcoming work includes developing spatially explicit models of avian densities and population sizes across the boreal, projecting avian responses to future changes climate and land use, and estimating population impacts of natural and anthropogenic disturbances since 1990.

BAM includes the following people:
Steering Committee: Erin Bayne, Steve Cumming, Fiona Schmiegelow, and Samantha Song
Staff: Trish Fontaine (Spatial Database Manager), Diana Stralberg (PhD Candidate), and Péter Sólymos (Statistical Ecologist).
Project Affiliates: Lisa Mahon and Steve Matsuoka.
Technical Committee: Marcel Darveau, Jean-Luc DesGranges, André Desrochers, Pierre Drapeau, Charles Francis, Colleen Handel, Keith Hobson, Craig Machtans, Julienne Morissette, Gerald Niemi, Rob Rempel, Stuart Slattery, Phil Taylor, Steve Van Wilgenburg, Lisa Venier, Pierre Vernier, and Marc-André Villard.

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NORTH AMERICAN BREEDING BIRD SURVEY, ALASKA, 2013 UPDATE

Steve Matsuoka, U.S. Fish and Wildlife Service, Migratory Bird Management

Boreal Partners in Flight

The North America Breeding Bird Survey (BBS) is the longest running omnibus survey of breeding birds in Alaska. This program became operational in Alaska in 1982 and a decade later underwent a considerable expansion due to participation by the members of Boreal Partners in Flight (Fig. 1). The BBS website (Sauer et al. 2012) currently has information available on numbers of routes run up to 2012 (Fig. 1). In 2012, BBS surveys were conducted on 71 routes, just below the statewide average of 73 routes per year since 1993. Through the dedication of many observers, the program has now run 85 routes for ≥10 years, 66 routes for ≥15 years, and 34 routes for ≥20 years. Ten routes have been run for ≥25 years: Ketchikan, Toklat, Zimovia Strait (25 years), Juneau, Kachemak, Seven Lakes (27 years), Anchor River, Galena (28 years), Little Salcha (29 years), and Swan Lake Road (31 consecutive years!).

This consistency and long-term effort is providing trends in abundance for more than 100 species breeding in Alaska. These trends are available on BBS website (http://www.pwrc.usgs.gov/bbs/results/) for the period 1980–2007 for Alaska and for the period 1966–2011 for North America (Sauer et al. 2012; Tables 1 and 2). Notably, 5 species showed significant populations declines and 11 species significant population increases ($P \leq 0.15$, Table 2).

Declining birds include 3 Neotropical migrants and 2 temperate migrants: Common Merganser (−5.7% per year), Violet-green Swallow (−3.3% per year), Blackpoll Warbler (−3.0%), Lesser Yellowlegs (−2.0%), and Savannah Sparrow (−0.7%). The trends of the latter 3 species mirrored the survey-wide trends. The cause of these declines should be the focus of research or conservation, which might take advantage of broader initiatives focused on conserving declining aerial insectivores (Nebel et al. 2010, Shutler et al. 2012), boreal wetland birds (Austin et al. 2000, Greenberg et al. 2011), or South American

migrants (U.S. Fish and Wildlife Service 2007). The list of birds with increasing trends only includes one Neotropical migrant (Northern Waterthrush) with the remaining species either residents or temperate migrants (Table 2).

In 2014 we hope to continue widespread participation in the BBS in Alaska, run a minimum of 70 routes, and collect GPS locations for all count stops. The latter should be submitted to the national office along with the count data. The former will include filling route vacancies (http://www.pwrc.usgs.gov/bbs/results/routemaps/index.cfm).

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Table 1. Trends in avian abundance (% change per year) for 108 species estimated from the North American Breeding Bird Survey (BBS). Analyses differed with route regression used in Alaska and hierarchical Bayesian models used for the survey-wide data (Sauer and Link 2011). Survey-wide trends do not use data from Alaska and northern portions of Canadian provinces because the data are too sparse or do not include the long-term period of analysis.

	Alaska BBS					Survey-wide BBS					
	1980–2007					1966–2011 Trends				2001–2011 Trends	
Species	Trend	*P*	N	R.A.		Trend	95% CI	N	R.A.	Trend	95% CI
Canada Goose	-0.6	0.89	42	2.70	*[1]	10.8	(9.1, 14.1)	2,717	8.5	13.2	(0.6, 24.2)
American Wigeon	1.4	0.36	45	5.17	*	-2.8	(-4.6, -1.6)	574	1.8	0.3	(-2.1, 3.6)
Mallard	4.8	0.28	47	1.44	*	0.2	(-0.5, 0.9)	3,233	8.4	1.1	(-0.5, 2.7)
Northern Shoveler	2.8	0.60	17	0.59	*	2.5	(0.7, 3.9)	667	1.5	10.2	(6.1, 14.9)
Northern Pintail	3.9	0.35	27	2.46	*	-1.3	(-4.2, 0.6)	740	1.9	9.8	(4.4, 15.8)
Green-winged Teal	5.1	0.28	40	2.13	*	-0.3	(-2.6, 1.0)	786	0.5	1.9	(-1.8, 6.1)
Ring-necked Duck	38.3	0.14	10	0.11		2.8	(-2.6, 6.5)	472	0.4	6.9	(-1.8, 20.1)
Lesser Scaup	3.3	0.55	15	0.44	*	-2.1	(-6.8, -0.1)	493	6.5	4.9	(0.8, 10.0)
Bufflehead	2.9	0.69	16	0.55	*	2.6	(-0.7, 4.5)	240	0.5	4.1	(1.2, 6.9)
Common Goldeneye	-5.7	0.31	18	0.51	*	1.0	(-1.3, 2.9)	331	0.4	2.7	(-1.3, 7.5)
Barrow's Goldeneye	4.3	0.17	10	0.60		-1.4	(-3.8, 0.8)	97	0.6	-1.2	(-7.2, 2.3)

	Alaska BBS					Survey-wide BBS					
	1980–2007					1966–2011 Trends				2001–2011 Trends	
Species	Trend	*P*	N	R.A.		Trend	95% CI	N	R.A.	Trend	95% CI
Common Merganser	-6.1	0.15	24	0.21	*	-1.8	(-4.7, 0.0)	855	0.4	1.1	(-1.1, 3.9)
Red-breasted Merganser	0.1	0.96	19	4.04	*	-7.6	(-30.9, -1.0)	79	0.1	0.9	(-22.4, 15.7)
Ring-necked Pheasant	14.9	0.04	2	0.41		-0.4	(-0.9, 0.0)	1,835	16.4	1.4	(0.1, 2.7)
Ruffed Grouse	3.7	0.75	9	0.16		0.6	(-0.9, 1.9)	1,199	0.4	2.5	(-1.3, 6.5)
Sooty Grouse	-1.6	0.90	11	2.36		-1.6	(-3.1, -0.1)	122	1.2	-1.2	(-4.3, 1.9)
Common Loon	0.7	0.67	28	0.26	*	0.9	(-0.3, 1.9)	831	1.2	1.2	(-0.3, 2.7)
Horned Grebe	8.0	0.24	9	0.11		-1.8	(-3.8, 0.0)	182	0.4	1.8	(-2.8, 8.3)
Red-necked Grebe	-0.5	0.90	24	0.42	*	0.2	(-1.1, 1.5)	189	0.6	1.8	(-0.9, 4.8)
Pelagic Cormorant	-6.4	0.75	4	0.36		-4.3	(-10.6, 2.3)	20	7.7	-3.3	(-10.6, 8.7)
Great Blue Heron	-4.3	0.32	8	0.66		0.8	(0.5, 1.1)	3,421	0.7	1.6	(0.9, 2.2)
Bald Eagle	5.1	0.03	51	1.35	*	5.4	(4.1, 6.7)	757	0.1	10.0	(6.7, 14.1)
Northern Harrier	10.7	0.07	9	0.06		-0.9	(-1.5, -0.4)	1,838	0.4	0.0	(-1.1, 1.1)
Sharp-shinned Hawk	14.1	0.14	5	0.02		1.2	(-2.4, 2.2)	1,287	0.0	2.4	(0.2, 4.9)
Northern Goshawk	7.7	0.18	6	0.02		0.6	(-1.4, 2.5)	418	0.0	4.9	(-0.2, 13.7)
Red-tailed Hawk	-0.5	0.93	22	0.12	*	1.7	(1.5, 1.9)	4,001	1.0	2.1	(1.7, 2.6)
Golden Eagle	10.2	0.50	6	0.05		0.0	(-0.9, 0.7)	662	0.2	0.9	(-0.4, 2.2)
American Kestrel	15.5	0.10	5	0.04		-1.5	(-2.5, -1.1)	3,418	1.0	-0.9	(-1.5, 0.0)
Merlin	7.6	0.12	12	0.06		3.1	(1.1, 4.4)	547	0.0	5.3	(1.9, 8.4)
Sandhill Crane	1.4	0.58	37	1.41	*	5.3	(3.5, 6.3)	674	1.1	8.3	(6.2, 10.6)
Killdeer	2.9	0.19	2	0.05		-1.2	(-1.6, -1.0)	4,060	6.3	-0.3	(-0.7, 0.2)
Spotted Sandpiper	-0.7	0.82	46	2.28	*	-1.4	(-2.0, -0.8)	1,816	0.5	-0.4	(-1.4, 0.9)
Solitary Sandpiper	-3.1	0.18	27	0.57	*	-0.7	(-6.0, 2.1)	102	0.1	0.8	(-6.4, 6.1)
Greater Yellowlegs	1.1	0.70	38	1.40	*	3.7	(-0.4, 6.9)	105	0.2	7.9	(0.2, 20.2)
Lesser Yellowlegs	-2.0	0.11	45	2.34	*	-5.3	(-8.1, -3.3)	134	0.7	-2.9	(-6.6, 1.9)
Upland Sandpiper	-11.4	0.00	6	0.09		0.5	(0.0, 1.0)	989	3.3	1.3	(0.1, 2.5)
Wilson's Snipe	1.7	0.07	88	9.83	*	0.3	(-0.2, 0.9)	1,714	4.4	2.9	(1.5, 4.2)
Herring Gull	-2.3	0.58	26	0.61	*	-3.8	(-23.0, -2.0)	648	16.4	-4.4	(-14.6, 0.0)
Glaucous-winged Gull	-0.8	0.90	36	8.27	*	1.0	(-1.4, 3.2)	55	26.9	1.4	(-2.7, 5.6)
Rock Pigeon	13.7	0.03	4	3.03		-1.0	(-1.3, -0.6)	3,300	9.5	0.3	(-0.5, 1.1)
Great Horned Owl	11.1	0.25	15	0.13	*	-0.8	(-3.0, -0.3)	2,492	0.2	0.0	(-2.5, 1.0)
Short-eared Owl	13.8	0.34	8	0.14		-0.7	(-4.9, 1.7)	449	0.1	9.9	(3.2, 19.1)
Rufous Hummingbird	2.7	0.51	18	2.18	*	-2.0	(-2.7, -1.4)	345	1.5	-1.5	(-2.7, -0.1)
Belted Kingfisher	-2.3	0.32	38	0.45	*	-1.6	(-2.0, -1.2)	2,984	0.3	-1.4	(-2.3, -0.5)
Red-breasted Sapsucker	6.6	0.00	17	10.29	*	0.2	(-1.0, 1.4)	273	1.4	0.7	(-2.1, 3.6)
Downy Woodpecker	19.0	0.29	19	0.06		0.1	(-0.1, 0.3)	3,379	1.1	-0.2	(-0.8, 0.3)
Hairy Woodpecker	1.0	0.71	30	0.20	*	0.9	(0.5, 1.3)	3,225	0.5	1.3	(0.4, 2.1)
Amer. Three-toed Woodpecker	-3.5	0.43	16	0.09		3.2	(-0.2, 5.9)	145	0.1	6.4	(2.4, 11.3)
Northern Flicker	0.8	0.78	41	0.34	*	-1.5	(-1.7, -1.2)	4,018	3.0	-0.8	(-1.4, -0.2)
Olive-sided Flycatcher	-1.0	0.46	56	1.50	*	-3.5	(-4.6, -2.9)	1,232	1.5	-2.4	(-3.6, -1.0)
Western Wood-Pewee	-0.4	0.94	25	0.46	*	-1.7	(-2.4, -1.2)	1,223	6.0	-0.5	(-1.2, 0.2)
Yellow-bellied Flycatcher	51.8	0.28	5	0.09		2.1	(0.0, 3.7)	457	1.2	3.5	(-0.9, 8.0)
Alder Flycatcher	0.0	0.96	79	17.94	*	-1.2	(-2.0, -0.5)	1,313	14.8	-1.3	(-2.7, 0.1)
Least Flycatcher	24.0	0.58	3	0.03		-1.8	(-2.3, -1.4)	1774	7.0	-2.1	(-3.2, -1.3)
Hammond's Flycatcher	-0.9	0.77	23	2.04	*	0.8	(0.1, 1.6)	472	5.4	0.9	(-0.7, 2.4)
Pacific-slope Flycatcher	1.1	0.60	16	16.45	*	-0.7	(-1.5, -0.1)	648	4.4	-1.1	(-2.6, 0.4)
Say's Phoebe	3.6	0.76	10	0.11		1.0	(-38.7, 1.6)	976	0.9	1.9	(0.9, 3.2)
Warbling Vireo	10.9	0.31	5	0.84		0.8	(0.4, 1.1)	2,747	5.1	1.3	(0.7, 2.0)
Gray Jay	1.7	0.01	57	5.07	*	-0.2	(-1.6, 0.9)	719	1.8	1.5	(-1.1, 4.4)
Steller's Jay	0.2	0.88	24	3.90	*	-0.1	(-0.5, 0.2)	619	4.3	-0.4	(-1.3, 0.4)
Black-billed Magpie	1.4	0.27	32	0.90	*	-0.6	(-1.0, -0.3)	1,052	11.2	-0.6	(-1.4, 0.1)
Northwestern Crow	4.8	0.00	22	17.00	*	0.2	(-1.0, 1.4)	49	62.1	0.3	(-2.5, 2.4)
Common Raven	2.9	0.13	100	4.39	*	2.5	(1.8, 3.0)	2,352	6.7	3.6	(2.9, 4.4)
Horned Lark	12.2	0.04	4	0.14		-2.4	(-2.8, -2.1)	2,548	66.1	-0.9	(-1.5, -0.3)
Tree Swallow	2.7	0.36	69	4.55	*	-1.1	(-1.7, -0.7)	2,944	6.1	-0.1	(-0.8, 0.5)
Violet-green Swallow	-3.3	0.10	43	1.06	*	-0.3	(-1.0, 0.2)	931	10.7	0.3	(-0.6, 1.3)
Bank Swallow	5.8	0.05	44	10.67	*	-5.5	(-7.3, -2.8)	1,818	12.2	0.3	(-4.0, 12.2)
Cliff Swallow	0.6	0.86	30	3.17	*	0.4	(-1.4, 1.2)	2,889	73.5	4.6	(3.3, 6.2)
Barn Swallow	0.1	0.99	12	1.12		-1.2	(-1.4, -1.0)	4,140	15.3	0.0	(-0.4, 0.4)
Black-capped Chickadee	-0.1	0.95	56	0.96	*	0.7	(0.4, 1.0)	2,268	4.1	0.5	(-0.4, 1.2)
Chestnut-backed Chickadee	0.1	0.96	20	8.17	*	-1.4	(-2.4, -0.5)	233	7.2	-1.7	(-4.1, 0.5)
Boreal Chickadee	0.3	0.88	52	0.80	*	0.7	(-0.6, 1.8)	371	0.3	2.0	(-4.6, 7.0)
Red-breasted Nuthatch	19.7	0.23	19	0.08		1.5	(0.9, 2.1)	1,679	3.0	0.1	(-1.6, 1.6)
Brown Creeper	13.6	0.23	16	0.58	*	0.7	(-0.1, 4.6)	1,075	0.3	1.6	(-1.8, 15.3)
Pacific Wren	-0.7	0.31	23	17.18	*	-0.8	(-1.6, -0.1)	327	5.3	-5.9	(-7.6, -4.3)
American Dipper	-26.0	0.12	4	0.02		-0.4	(-1.7, 0.7)	216	0.1	0.1	(-2.5, 2.3)
Golden-crowned Kinglet	-1.2	0.52	33	1.83	*	-1.3	(-3.4, -0.3)	1,055	3.1	-0.7	(-3.2, 1.9)
Ruby-crowned Kinglet	0.1	0.90	77	6.11	*	0.2	(-0.9, 1.1)	1,169	11.6	1.2	(-1.3, 3.7)

	Alaska BBS					Survey-wide BBS					
	1980–2007					1966–2011 Trends				2001–2011 Trends	
Species	Trend	*P*	N	R.A.		Trend	95% CI	N	R.A.	Trend	95% CI
Townsend's Solitaire	29.9	0.35	9	0.14		0.6	(-0.8, 1.3)	512	0.6	1.8	(0.0, 3.2)
Swainson's Thrush	0.5	0.37	82	25.42	*	-1.0	(-1.6, -0.5)	1,251	36.6	-0.9	(-1.8, 0.1)
Hermit Thrush	0.2	0.75	69	6.09	*	0.9	(0.0, 1.6)	1,573	9.2	0.9	(-0.7, 2.6)
American Robin	1.3	0.06	100	19.51	*	0.2	(0.1, 0.3)	4,026	32.2	0.3	(0.1, 0.6)
Varied Thrush	0.8	0.33	89	11.81	*	-2.2	(-3.0, -1.4)	282	8.7	-3.7	(-5.5, -2.0)
European Starling	-5.1	0.79	4	0.71		-1.4	(-1.6, -1.2)	4,066	43.9	-1.1	(-1.5, -0.8)
Northern Waterthrush	2.0	0.01	72	12.37	*	0.9	(0.1, 1.7)	1,006	2.1	2.3	(-0.3, 4.9)
Orange-crowned Warbler	-0.4	0.48	93	17.07	*	-1.0	(-1.6, -0.3)	736	4.8	0.8	(-0.7, 2.6)
MacGillivray's Warbler	-11.4	0.39	5	1.16		-1.0	(-12.0, -0.3)	624	6.7	-0.9	(-2.1, 0.5)
Common Yellowthroat	9.9	0.01	8	0.07		-1.0	(-1.2, -0.8)	3,683	9.0	-0.9	(-1.2, -0.5)
American Redstart	14.9	0.19	3	0.45		-0.4	(-0.8, 0.1)	2,006	4.5	-0.5	(-2.4, 0.9)
Yellow Warbler	-0.8	0.39	95	10.51	*	-0.5	(6.1, -0.3)	3,284	6.7	-0.4	(-0.9, 0.0)
Blackpoll Warbler	-3.0	0.00	56	5.94	*	-6.4	(-22.1, 0.6)	230	2.7	-3.3	(-13.9, 26.9)
Yellow-rumped Warbler	0.1	0.84	82	14.02	*	0.1	(-0.6, 0.6)	1,666	10.9	1.0	(0.0, 2.2)
Townsend's Warbler	0.7	0.80	40	2.95	*	0.0	(-0.8, 0.7)	268	9.7	0.0	(-1.4, 1.3)
Wilson's Warbler	0.9	0.30	90	15.30	*	-1.8	(-2.9, -1.0)	938	2.2	0.3	(-1.3, 2.2)
Chipping Sparrow	-6.2	0.35	13	0.30		-0.5	(-0.9, -0.3)	3,654	11.4	-0.1	(-0.6, 0.3)
Savannah Sparrow	-0.7	0.10	77	21.21	*	-1.2	(-1.6, -0.9)	2,248	20.5	-1.1	(-1.7, -0.4)
Fox Sparrow	2.9	0.00	95	15.59	*	0.2	(-1.8, 1.9)	431	2.4	1.5	(-4.3, 7.6)
Song Sparrow	0.2	0.94	31	1.02	*	-0.7	(-0.9, -0.5)	3,228	15.0	-0.6	(-0.9, -0.3)
Lincoln's Sparrow	3.3	0.05	71	3.01	*	-1.1	(-2.6, 0.5)	844	9.0	0.4	(-1.5, 2.2)
White-crowned Sparrow	-0.5	0.49	79	28.32	*	-0.8	(-1.4, -0.2)	508	5.8	0.5	(-0.8, 2.1)
Dark-eyed Junco	0.0	0.94	84	23.22	*	-1.3	(-1.9, -0.8)	1,568	12.7	-0.8	(-1.8, 0.2)
Western Tanager	-12.5	0.21	5	0.31		1.2	(0.8, 1.5)	926	6.4	1.5	(0.8, 2.2)
Red-winged Blackbird	-2.4	0.73	9	0.09		-0.9	(-1.1, -0.7)	4,223	72.1	-0.6	(-0.9, -0.2)
Rusty Blackbird	-2.4	0.59	28	0.82	*	-4.9	(-8.1, -1.6)	231	0.2	-2.2	(-10.5, 9.1)
Pine Grosbeak	1.5	0.57	40	0.43	*	-2.4	(-7.6, 0.3)	244	0.2	0.6	(-4.3, 6.8)
Red Crossbill	1.3	0.69	16	6.30	*	-1.2	(-10.3, 0.8)	798	6.1	0.3	(-5.6, 6.2)
White-winged Crossbill	4.2	0.18	49	3.27	*	2.6	(-7.1, 7.6)	369	5.3	2.0	(-14.8, 18.0)
Pine Siskin	-2.1	0.19	43	2.56	*	-3.8	(-5.8, -2.4)	1,387	21.1	-7.7	(-10.5, -5.0)

[1] An asterisk denotes those trend estimates from Alaska that have reasonable credibility due to adequate numbers of species detections (≥0.1 birds per route) and numbers of routes with species occurrence (≥14 routes, Sauer et al. 2012).

N is the number of routes with species detections, R.A. is the average abundance per route, and 95% CI is the credible interval.

Table 2. Species with significant ($P \leq 0.15$) trends in abundance in Alaska from 1980–2007 as estimated from the North American Breeding Survey. Survey-wide trends are also presented for comparison.

	Alaska BBS				Survey-wide BBS					
	1980–2007				1966–2011 Trends				2001–2011 Trends	
Species	Trend	*P*	N	R.A.	Trend	95% CI	N	R.A.	Trend	95% CI
Common Merganser	-6.1	0.15	24	0.21	-1.8	(-4.7, 0.0)	855	0.4	1.1	(-1.1, 3.9)
Violet-green Swallow	-3.3	0.10	43	1.06	-0.3	(-1.0, 0.2)	931	10.7	0.3	(-0.6, 1.3)
Blackpoll Warbler	-3.0	0.00	56	5.94	-6.4	(-22.1, 0.6)	230	2.7	-3.3	(-13.9, 26.9)
Lesser Yellowlegs	-2.0	0.11	45	2.34	-5.3	(-8.1, -3.3)	134	0.7	-2.9	(-6.6, 1.9)
Savannah Sparrow	-0.7	0.10	77	21.21	-1.2	(-1.6, -0.9)	2,248	20.5	-1.1	(-1.7, -0.4)
American Robin	1.3	0.06	100	19.51	0.2	(0.1, 0.3)	4,026	32.2	0.3	(0.1, 0.6)
Gray Jay	1.7	0.01	57	5.07	-0.2	(-1.6, 0.9)	719	1.8	1.5	(-1.1, 4.4)
Wilson's Snipe	1.7	0.07	88	9.83	0.3	(-0.2, 0.9)	1,714	4.4	2.9	(1.5, 4.2)
Northern Waterthrush	2.0	0.01	72	12.37	0.9	(0.1, 1.7)	1,006	2.1	2.3	(-0.3, 4.9)
Fox Sparrow	2.9	0.00	95	15.59	0.2	(-1.8, 1.9)	431	2.4	1.5	(-4.3, 7.6)
Common Raven	2.9	0.13	100	4.39	2.5	(1.8, 3.0)	2,352	6.7	3.6	(2.9, 4.4)
Lincoln's Sparrow	3.3	0.05	71	3.01	-1.1	(-2.6, 0.5)	844	9.0	0.4	(-1.5, 2.2)
Northwestern Crow	4.8	0.00	22	17.00	0.2	(-1.0, 1.4)	49	62.1	0.3	(-2.5, 2.4)
Bald Eagle	5.1	0.03	51	1.35	5.4	(4.1, 6.7)	757	0.1	10.0	(6.7, 14.1)
Bank Swallow	5.8	0.05	44	10.67	-5.5	(-7.3, -2.8)	1,818	12.2	0.3	(-4.0, 12.2)

	Alaska BBS				Survey-wide BBS					
	1980–2007				1966–2011 Trends				2001–2011 Trends	
Species	Trend	*P*	N	R.A.	Trend	95% CI	N	R.A.	Trend	95% CI
Red-breasted Sapsucker	6.6	0.00	17	10.29	0.2	(-1.0, 1.4)	273	1.4	0.7	(-2.1, 3.6)

N is the number of routes with species detections, R.A. is the average abundance per route, and 95% CI is the credible interval.

STATEWIDE HUNTER HARVESTED GROUSE AND PTARMIGAN WING COLLECTION PROGRAM, ALASKA, 2013 UPDATE

Richard A. Merizon, Alaska Department of Fish and Game

In August 2011, the statewide Small Game Program within the Alaska Department of Fish and Game (ADF&G) initiated a statewide grouse and ptarmigan wing collection program from hunter harvested birds. This remains a voluntary program with no penalty for not participating. During the 2012 regulatory year (RY; RY12 = 1 July 2012 through 30 June 2013) hunters provided wings from 25 ruffed, 243 spruce, 45 sharp-tailed, and 41 sooty grouse in addition to 474 willow, 109 rock, and 14 white-tailed ptarmigan wings statewide (Merizon 2012). Samples were collected from 17 of the 26 game management units statewide including the Alaska Peninsula, Northwest, Southwest, and Southeast Alaska, and most of the road system from the Dalton Highway to Homer.

These samples allow managers to better understand the harvest composition of exploited populations of tetraonids. Specifically, they allow an estimation of sex ratios, juvenile production, and harvest distribution. We were also able to test an alternative means of estimating sex among willow ptarmigan using only a wing when the whole carcass was available.

This program will continue and is a permanent portion of the ADF&G Small Game Program. The ADF&G provides individual wing envelopes and free return options to encourage participation. Through September 2013, hunters have provided a total of nearly 200 samples statewide.

Literature Cited:

Merizon, R. A. 2013. Status of grouse, ptarmigan, and hare in Alaska, 2013. Alaska Department of Fish and Game. Wildlife Management Report, ADF&G/DWC/WMR-2013-3. Anchorage.

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ROAD-SYSTEM GROUSE AND PTARMIGAN ABUNDANCE SURVEYS, ALASKA, 2013 UPDATE

Richard A. Merizon, Alaska Department of Fish and Game

Springtime breeding behavior of many tetraonids allows a means to index annual abundance and the cyclic nature of grouse and ptarmigan populations. In Alaska, male ruffed, sharp-tailed, and sooty grouse, as well as willow and rock ptarmigan perform conspicuous, springtime, territorial displays. Male spruce grouse and white-tailed ptarmigan also perform a springtime display, but it is one that is not easily located or viewed, making monitoring of population abundance through this behavior more challenging. These 2 species are monitored through wing collections, periodic site visits to areas where fall harvest occurs, and reports from DWC biologists, hunters, and outdoor enthusiasts.

The spring breeding season for grouse and ptarmigan in Alaska occurs from late April through early June. Due to the geography of Alaska, limited road system, poor access off the road system in the spring, and staff limitations, the Small Game Program is restricted to species and areas in which population abundance can be assessed. Therefore, the program has focused on those populations that are either heavily exploited by hunters, within popular outdoor recreational areas, or very close to large urban areas or road-systems, and afford consistent and reliable access from year to year.

Survey methods utilized for ruffed and sharp-tailed grouse and willow and rock ptarmigan are consistent with state and national techniques. For ruffed grouse, roadside and trail transects were established in Anderson (1993), Delta Junction (2008), and Palmer (1992), and have been completed annually since their inception. Sharp-tailed grouse lek surveys were established in the Delta Junction Agricultural Project in 2000; additional leks have been located and monitored since. Sooty grouse observational data were collected for the first time beginning in spring of 2012 and will continue annually. For willow and rock ptarmigan, we use a broadcasted recording of a territorial male along established transects and record the number of males that respond within ¼ mile. Survey routes have been established along the Denali, Richardson, Parks, and Steese highways as well as locations away from road access to begin monitoring less heavily exploited populations. In 2013, survey routes were also established along the southern Kenai Peninsula and will be continued annually.

Based on these surveys it appears that monitored populations are generally abundant and widespread. Interior ruffed grouse populations are beginning to increase after recording the low in their population cycle in 2010–2011. Sharp-tailed grouse populations that breed on the Delta Agricultural Project appear to remain at moderate densities but have been stable since 2009. Monitored willow ptarmigan populations statewide appear to be growing with the exception of the western Denali Highway. However, monitored road-system rock ptarmigan populations are generally at or near historic lows however in 2013 they were more abundant than in the recent past.

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CLIFF-NESTING RAPTOR SURVEYS IN THE KILBUCK MOUNTAINS

Brian McCaffery and Kristine Sowl, Yukon Delta National Wildlife Refuge and Steve Lewis, Migratory Bird Management, US Fish and Wildlife Service

Between 1991 and 2004, Yukon Delta National Wildlife Refuge conducted annual surveys of cliff-nesting raptors in the Kilbuck Mountains of western Alaska. Because of concerns about both the continental status of golden eagles and the potential impacts of a proposed energy corridor through the Kilbuck Mountains, the location's status as an index area for coordinated statewide monitoring of cliff-nesting raptors, and the potential value of apex predators as sentinel species, we resumed those surveys in 2012. Occupancy and productivity surveys for rough-legged hawks, golden eagles, and gyrfalcons were conducted via R-44 helicopter with both a front and rear seat observer in the middle of May and July, respectively. In general, reproductive metrics in 2013 were poor for rough-legged hawks, fair for golden eagles, and great for gyrfalcons. Contact the refuge for specific information.

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MONITORING TERRITORY OCCUPANCY AND REPRODUCTIVE SUCCESS OF GOLDEN EAGLES IN DENALI NATIONAL PARK, ALASKA

Carol McIntyre, Denali National Park and Preserve, and Mark Paulson and Joshua Schmidt, NPS Central Alaska Monitoring Network

Golden Eagles are a vital sign of the NPS Central Alaska Monitoring Network. We have monitored territory occupancy and reproductive activities of Golden Eagles at over 80 nesting territories in the northern foothills of the Alaska Range in Denali annually since 1988 using 2 standardized aerial surveys supplemented by additional ground surveys (see McIntyre and Adams 1999, McIntyre and Schmidt 2012 for details). Challenging weather conditions during both the aerial and ground surveys hampered our survey efforts this year and we only monitored 48 nesting territories in 2013. As in past years, we conducted the occupancy survey in late April and the production survey in mid-July from an R-44 helicopter. Of the 48 territories monitored, 46 (96%) were occupied by a territorial pair of eagles. The proportion of territorial females that laid eggs (0.04; $n = 2$) and the proportion of territorial females that raised at least one fledgling (0.02; $n = 1$) were the lowest recorded in the history of the project. The number of fledglings per occupied territory (0.02; $n = 1$) was also the lowest recorded in the history of the project. We expected fewer females to lay eggs and raise young in 2013 due to the scarcity of snowshoe hare,

the primary live prey resource for eagles during the pre-laying and incubation periods. We documented similar lows in eagle reproduction in 1994, 2002 and 2012, all years when snowshoe hare abundance was very low. In 2013, we also continued our efforts to quantify: 1) the age structure of the territorial population; 2) interactions between territorial eagles and apparent floaters (eagles that are not territorial holders); and, 3) nest site fidelity and turnover rates at nesting territories (in cooperation with the USGS Alaska Science Center molecular genetics lab). Our work will continue in 2014.

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MONITORING TRENDS IN ABUNDANCE AND OCCUPANCY OF PASSERINE BIRDS IN THE NPS CENTRAL ALASKA MONITORING NETWORK

Carol McIntyre, Denali National Park, Jeremy Mizel, NPS Arctic Monitoring Network, and Mark Paulson, Jason Reppert and Joshua Schmidt, NPS Central Alaska Monitoring Network

Passerine birds are a vital sign of the NPS Central Alaska and Arctic Monitoring Networks. In 2013, we continued to conduct standardized surveys using a repeat sampling method on 3 roadside survey routes on the Denali Park Road (1,200 counts from April–June), 2 survey routes on the McCarthy Road (400 counts in June), and 3 survey routes on the upper Yukon River (300 counts in June). Species of interest on the roadside surveys included a singing male Cape May Warbler and 2 singing male Tennessee Warblers along the McCarthy Road. (Mark Vale, a resident of McCarthy, also located a successful breeding pair of Cape May Warblers near his property in 2013). We also conducted a pilot study on the upper Yukon River to document the breeding activities of Bank Swallows in preparation for a demographic study of this species. In 2013, we located 22 occupied Bank Swallow colonies along a 101-mile section of the upper Yukon River. Repeat surveys and Bank Swallow work will continue in 2014. Results of some passerine monitoring work were published in Biological Conservation in 2013:

Schmidt, J. H., C. L. McIntyre, and M. C. MacCluskie. 2013. Accounting for incomplete detection: What are we estimating and how might it affect long-term passerine monitoring programs. Biological Conservation 160:130–139.

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CHENEGA BAY HUMMINGBIRD BANDING PROJECT

Kate McLaughlin, McLaughlin Environmental Services, Chenega Bay, Alaska

The Native Village of Chenega Bay is located in western Prince William Sound on Evans Island in the North Gulf of Alaska. Western Prince William Sound marks the extreme northern breeding range of the Rufous Hummingbird, *Selasphorus rufus.*

There are approximately 335 species of hummingbirds in the New World. Only 17 species of hummingbirds breed in the United States and only one species, the Rufous Hummingbird, breeds in Alaska. The Chenega Bay Hummingbird Banding Project was established in 2007. This project, the only season-long (May–August) hummingbird banding station in Alaska, has been endeavoring to gather more complete natural history and migration data on this species through capture, mark and release studies.

With the completion of the 2013 banding year, a total of 1,869 birds have been banded with 323 recaptures (birds banded in previous years) since the project's start (Fig. 1; Table 1). Of those recaptures, only 2 birds were foreign recaptures (birds banded in another location by another bander). Both of these recaptures were each remarkable in proving the link between southern United States wintering ranges and Southcentral Alaska breeding grounds. The exact route taken on seasonal migrations by these birds is still unknown. No birds banded at the Chenega Bay station have been recaptured in other areas as of yet.

On 29 June 2010 an adult female Rufous Hummingbird was captured in Chenega Bay that had been banded in Tallahassee, Florida in January of that same year. This capture marked the long-distance record of any hummingbird caught on both sides of its migration, in this case a distance of over 3,500 miles. This was the first capture to match Alaska to Rufous wintering areas in the southeastern United States. On 4 July 2013, a second foreign recapture was documented, a hatch year female banded in the Fort Davis Mountains, Texas in August 2012. This meant that the bird was hatched in Prince William Sound in summer 2012 and within 45 days of fledging (sometime in July) migrated to south Texas (and perhaps beyond).

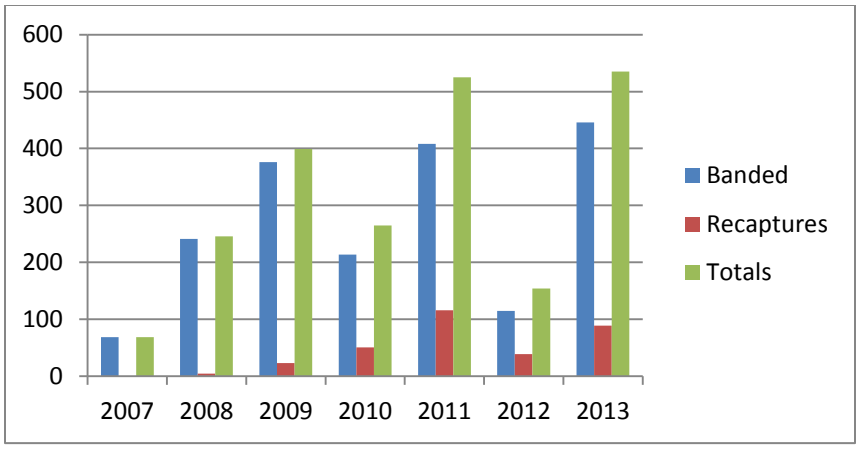

Figure 1. Chenega Bay Hummingbird Banding Project Total Capture Chart.

Table 1. Summary data for Chenega Bay Rufous Hummingbird Project.

Year	Banded	Recaptures	Totals	% recaptures
2007	69	0	69	0.0%
2008	241	5	246	2.1%
2009	376	23	399	6.1%
2010	214	51	265	23.8%
2011	408	116	525	28.4%
2012	115	39	154	33.9%
2013	446	89	535	20.0%
Totals	**1869**	**323**	**2193**	**17.3%**

In the data summary(Table 1, above), 2007 does not reflect a full banding year, as the project started during the last half of the breeding season and does not include the spring migration data. The 2012 season was a low banding year due to record snowfall during winter 2011–2012 when western Prince William Sound had over 28 feet of snow. We believe the heavy and late spring snow that delayed and suppressed the blueberry and salmonberry (important forage plants) bloom contributed significantly to the lower population of Rufous Hummingbirds in the western part of the Sound that year.

The 2013 banding year was the first year of collaboration with the U.S. Forest Service, Chugach National Forest District. Funding was supplied for a banding event to be held in the eastern side of the Sound in Cordova during the spring migration at the same time banding was occurring in Chenega. The goal was to gather migration data on birds during the first flush of migration into the Sound. The 2013 banding data totals reflect the effort in Cordova. The USFS and I have submitted information on that effort in Cordova in a separate report.

The rate of recapture (total for all years = 17%) demonstrates the strong site fidelity of the species. This project is providing much needed information on rufous hummingbird life history

and migration data in Southcentral Alaska and the links to wintering grounds throughout the southern United States.

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CORDOVA HUMMINGBIRD BANDING

Kate McLaughlin, McLaughlin Environmental Services and Erin Cooper, USFS Chugach National Forest

In 2013, a partnership was created between the Chenega Bay Hummingbird Banding Project, the US Forest Service, and the Western Hummingbird Partnership. The Western Hummingbird Partnership (WHP) is a developing network of partners collaborating to build an effective and sustainable hummingbird conservation program through science-based monitoring, research, habitat restoration/enhancement, and education/outreach efforts. Since 2007 the Chenega Bay Hummingbird Banding Project (CBHP) has banded and collected physical data on Rufous Hummingbirds (*Selasphorus rufus)* from the remote island community of Chenega Bay, located in western Prince William Sound, Alaska. Working with the Chugach National Forest Service and CBHP, the WHP provided funding to expand banding into the Cordova Area.

This project's main goal was to band hummingbirds during the first flush of spring migration. This banding effort coupled with work in Chenega Bay, Alaska, would then provide important information on Rufous Hummingbird populations and phenology in Prince William Sound. Banding was originally schedule for mid-May but due to inclement spring weather banding was conducted from 31 May to 1 June. Multiple feeders were scouted for trapping locations in Cordova including: the Cordova Airport area, central Cordova, Whitshed Road and Orca Road. Additionally, homeowners with active feeders in spring 2013 were contacted to determine possible trapping locations.

Spring flowers and plenty of small insects appear to have given the birds many food sources to choose from and therefore, the feeders were not heavily visited. The Orca Road area produced the only feeder location still actively used by hummingbirds during the trapping period. Light rain coupled with mid 40 degree temperatures gave the birds more reason to attend the feeder. For 2 days of trapping, 18 birds were captured and banded—all were females. Two males were sighted, but not at the feeders.

Plans are underway to continue this banding effort in Cordova in 2014.

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POTENTIAL CHANGES IN THE ABUNDANCE AND DISTRIBUTION OF BIRDS IN THE BOREAL-ARCTIC ECOTONE OF NORTHWESTERN ALASKA

Lance McNew and Colleen Handel, U.S. Geological Survey, Alaska Science Center

The goal of this project is to model projected changes in distribution and abundance of avian species in response to projected environmental changes associated with a shifting climate in the boreal-arctic transition zone of Alaska. Specific objectives include 1) evaluating the environmental correlates of distribution, abundance, and richness of landbird and shorebird species, and assessing how distribution, abundance, and community structure of birds have changed relative to changes in habitat over the last 25 years; 2) estimating productivity, recruitment and survival for a subset of species with varying life history traits at a series of sites located across an ecological gradient in the boreal-arctic transition zone; and 3) forecasting avian species, communities, habitats, and core geographic areas likely to be most vulnerable to projected climate changes, and key areas important for preserving biodiversity.

Summary of Field Effort in 2013

During 1988–1992 and 2000, point-transect surveys were conducted within 34 randomly-selected 10-km × 10-km sampling blocks on the Seward Peninsula. Point-transects of variable length were created non-randomly within these blocks (number of points = 900). We conducted replicated point-transect surveys for birds at 11 historical sampling blocks during the pre-breeding and nesting periods in 2013. The 11 selected survey blocks were chosen for accessibility and represented diverse habitat types occurring across variable permafrost conditions. The plots contained a total of 27 historical transects with 233 focal points. We conducted 10-minute focal observations at each point and recorded the number of individuals of each species detected up to 250 m from the point. Each point-transect was surveyed 2–3 times during a 4-week period corresponding to territory establishment and egg-laying (21 May–21 June). We recorded air temperature, wind speed, sky condition, and snow cover immediately prior to conducting bird surveys. During 2012, we detected 4,288 birds representing 49 species during 685 focal counts. Songbirds were the most detected guild (n = 3,477), followed by shorebirds (n = 520), ptarmigan (n = 143), jaegers (n = 101), waterfowl (n = 31), raptors (n = 8), and gulls (n = 4). Commonly detected songbirds included Lapland Longspur (*Calcarius lapponicus*; n = 739), Savannah Sparrow (*Passerculus sandwichensis*; n = 537), redpolls (*Acanthis* spp.; n = 506), Fox Sparrow (*Passerella iliaca*; n = 367), and Golden-crowned Sparrow (*Zonotrichia atricapilla*; n = 228). Wilson's Snipe (*Gallinago delicata*; n = 123) followed by Western Sandpiper (*Calidris mauri*; n = 94) and American Golden-Plover (n = 81) were the shorebirds detected most often (Table 1).

During 24 June–25 July, we classified each bird survey site according to the Swanson vegetation classification method. In addition, we collected 20 habitat measures at 10 subsample plots associated with each bird survey point during 27 June–12 July. Habitat covariates included the average heights and overlapping coverages of dwarf birch, willow, alder, ericaceous shrubs, and lichens within 250 m of each bird survey point. We measured thaw depth using a soil probe and took a soil temperature reading at a depth of 15–20 cm. In addition, we measured the average

proportion of bare ground, running water, and standing water and distance from the survey point to the nearest shrub in each of the 3 height categories (<50 cm, 50–100 cm, and >100 cm). We recorded elevation, slope, and aspect at each bird point. To evaluate potential food resources for breeding birds, we collected invertebrates using sweep-net sampling at 2–3 sampling transects 25-m in length that we randomly selected within 250-m of the bird survey point.

This project is scheduled to continue for 2 additional years (2014–2015). Funding is provided by the USGS Changing Arctic Ecosystems Research Initiative. We are grateful to Christin Anderson, Pat Farrell, Molly McDermott, Rachel Richardson, John Terenzi, Mackenzie Trainor, Caroline Van Hemert, and Skyler Vold for assistance in the field.

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Table 1. Number of observations by species during 10-min focal counts on the Seward Peninsula during 21 May - 21 June, 2013.

Gulls / Jaegers		Passerines		Ptarmigan		Raptors		Shorebirds		Waterfowl	
LTJA	96	LALO	739	WIPT	105	RLHA	4	WISN	134	CAGO	14
PAJA	5	SAVS	537	ROPT	38	NOHA	3	AMGP	81	SACR	13
GLGU	3	HORE	454			MERL	1	PAGP	60	NOPI	2
GWGU	1	FOSP	367					BTCU	44	RBME	2
		GCSP	228					BARG	29		
		ATSP	205					DUNL	19		
		GCTH	181					SURF	12		
		ARWA	138					SESA	2		
		BLUE	123					BASA	1		
		AMRO	99								
		WESA	94								
		YWAR	86								
		WCSP	66								
		Others	298								

BIRD OF PREY RESEARCH BY DAVID MOSSOP: 2013

D. Mossop, Northern Research Ctr, Yukon College, Whitehorse, Yukon, Canada

1) Gyrfalcon annual productivity survey -- Coast Mtns ecoregion North slope

A standard sample of nest sites was visited by helicopter. Occupancy and productivity data were collected. No survey occurred on the North Slope. Proposals continue to be submitted to revive and maintain this valuable database.

Progress: Historically, productivity in the Coast Range was high from1999 through the 2007 survey. In 2008 a significant drop was noted. This accompanied a growing troubling indication

that the adult breeding population in this group may be declining. In 2013 productivity was basically zero (Fig. 1).

Two papers are published in partnership with N. Barichello. These presented analysis of over 40 years of ptarmigan and gyrfalcon research published by the Peregrine Fund at the University of Idaho, Boise.

Reporting:
2011 The overwhelming influence of ptarmigan abundance on gyrfalcon reproductive success in the central Yukon, Canada. *In*: R. T. Watson, T. J. Cade, M. Fuller, G. Hunt, and E. Potapov, editors. Gyrfalcons and Ptarmigan in a changing world. The Peregrine Fund Publ., Boise.

2011 Long-term studies of willow ptarmigan and gyrfalcon in the Yukon Territory: a collapsing 10-year cycle and its apparent effect on the top predator. *In*: R. T. Watson, T. J. Cade, M. Fuller, G. Hunt, and E. Potapov, editors. Gyrfalcon and Ptarmigan in a Changing World. The Peregrine Fund Publ. Boise.

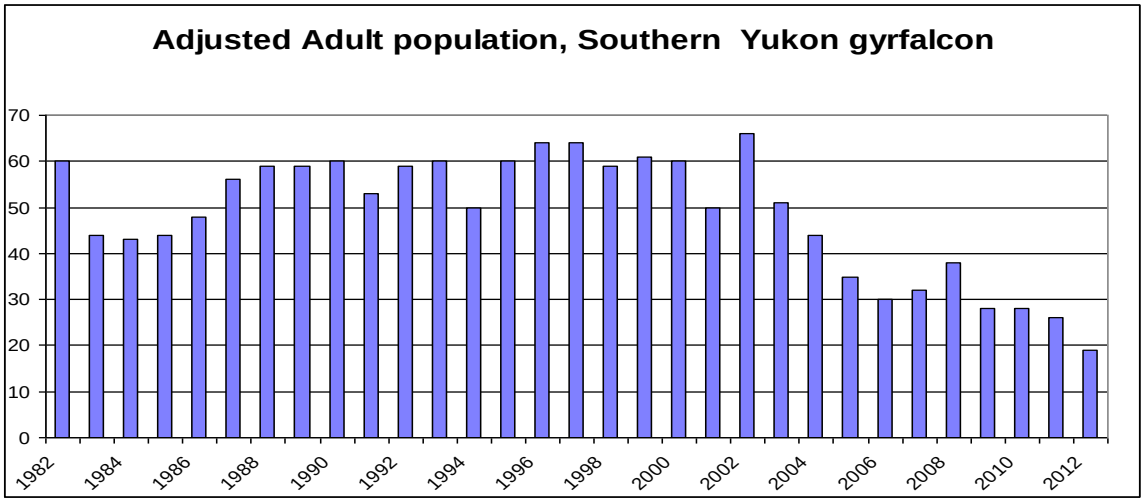

Figure 1. Summary of survey data for adult gyrfalcons in southern Yukon.

2) Peregrine falcon productivity study -- Yukon

The last comprehensive reporting year was 2010 for the peregrine falcon survey. All 5 subpopulations were surveyed then by a variety of mostly volunteer and government personnel. Just under 70% of known pairs were visited (approximately 170 sites visited). Data for these surveys is presented in Figure 2.

No new survey was conducted in 2013. The Old Crow River was monitored upstream to approximately the mouth of Timber creek.

Progress: Production of young appeared normal to high (about 90% of sites visited) in the current year (This is in contrast to the alarmingly low productivity observed in the recent past.)

Reporting:
2010. Population status of the peregrine falcon in the Yukon Territory.
Northern Res. Inst ms, Yukon College 12 pp + append

Prey use and selection in relation to reproduction by peregrine falcons breeding along the Yukon river, Canada. Journal of Raptor Research 45(1):27–37. R. D. Dawson sr author.

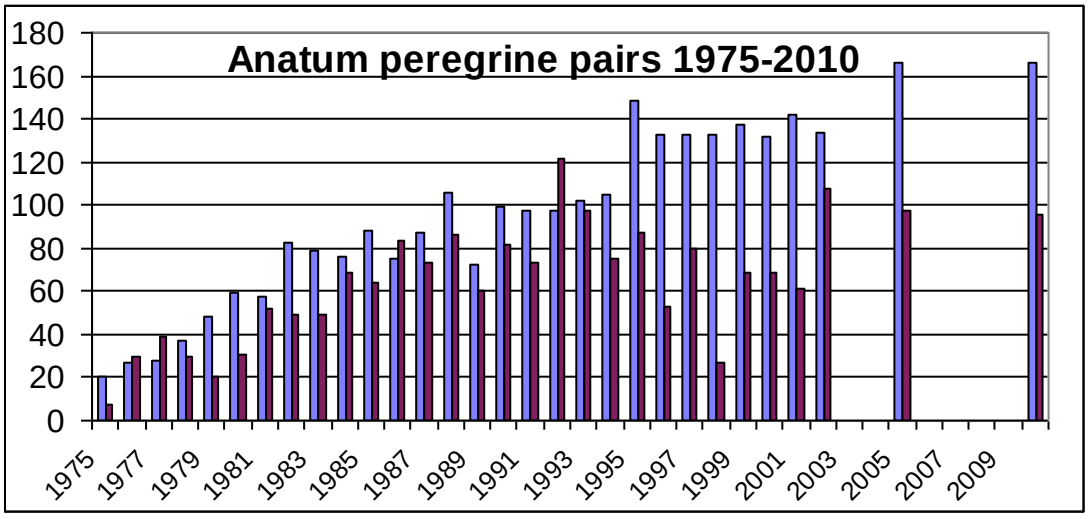

Figure 2. Data for peregrine productivity study.

3) Breeding status of American Kestrel; old growth studies-- Yukon wide.

This project is monitoring the use of cavities by American Kestrels, Boreal Owls and other larger cavity nesters like Bufflehead ducks to understand the species' interrelationships in 'true old growth'. Cavity nesters are being researched as potential indicator species for these unique forest groves.

Progress: In the current year we re-checked 100 nest boxes for use. Kestrel numbers have collapsed alarmingly in the last few years, a situation which continued. This year one pair was found producing young. Our work was part of a larger effort examining the status of American Kestrels across North America. In this year an inter-jurisdictional working group was stuck to coordinate effort into understanding this decline. An initial meeting was held in January 2013.

Reporting:
2010. Why are American Kestrels (*Falco sparvarius)* declining in N.A.? Evidence from nest box programs. Smallwood ed: 12 authors: Journal of Raptor Research 43(4):274–282. (J. A Smallwood sr. author)

4) Gyrfalcon conservation population integrity and harvest-- Coast Mountains, Whitehorse

In 1997, this project produced an analysis of 15 years of productivity data of the gyrfalcons breeding in the Coastal Mountains south of Whitehorse and straddling the British Columbia (B.C.) border. The harvest of young birds from this population is allowed annually principally by B.C. Sustainability of the harvest was subjected to basic modeling analysis. The suggestion was that the then harvest was probably not sustainable. In 2001 a consultant's report discussed various options for determining how to better manage the harvest of Gyrfalcons from the population. A strategy for assessing and protecting gyrfalcons at the population level was suggested (currently the harvest is basically from an unknown source). Annual harvest was to be set according to an annual survey. In 2004 a project partnership with BC Environment and YTG Environment was struck and funded principally through a grant from the B.C. government. More intensive monitoring, banding of young and DNA sampling is involved. Blood samples are being analyzed for DNA markers and isotope concentration to begin a larger data base of gyrfalcon population identity throughout the Pacific Northwest. As part of this study gyrfalcons have also been monitored on the Chilkat Pass during the fall.

The 2013 gyrfalcon harvest limit suggested by our work was: zero.

Reporting:
1997. Gyrfalcon population monitoring and harvest in the BC/Yukon Coast Mountain ecoregion. N. Res. Inst, Yukon College ms
2008. Bird of Prey Migration Monitoring Station – Chilkat Pass. N..Res Inst ms Yukon College

5) Bird of prey inventory and management planning for Yukon parks: Aga Mene and Kusawa park planning areas

This work builds on basic inventory data bases tracking the status of common loons, large cliff and tree nesting birds of prey and smaller hole-nesting birds. As top predators raptors are powerful indicators of ecological integrity, loons are known as key indicators of lake ecosystem

health. Survey of the planning areas for Aga Mene and Kusawa Parks was completed, data analyzed and a protocol for future monitoring was developed.

In the 2012 field season, YC student J.Vigliotti assumed the role of expanding and completing a set of field monitoring protocols for the Age Mene park area: a) Monitoring of an inventory of nesting common loons, b) visiting a set of 20 nesting boxes to track the population of tree and violet green swallows, and c) monitoring the occupancy and productivity of an inventory of bald eagle and osprey nest sites. Other protocols addressing winter track counts and breeding song birds were added this year.

Progress: A good sample of breeding pairs of key species is now in the data base on which to carry out future monitoring. Addresssing raptors, Kusawa park is primarily alpine, the key species are gyrfalcon and golden eagle. Aga Mene is primarily riparian, key species are Bald eagle and osprey. An extremely dense population of common loons has been identified in the latter park that will make a very powerful indicator to track in the future.

Reporting:

2010. Inventory of bald eagle and Osprey nest sites, Aga Mene Park, Southern Lakes, Yukon. Northern Res. Inst ms, Yukon College.
2010. Raptor populations of the Kusawa Park, Yukon-Stikine ecoregion, Yukon Northern Res. Inst ms, Yukon College.
2011 (Jesse Vigliotti sr author). Ecological monitoring protocols for the management of Agay Mene Territorial Park. Yukon College Ms. A report to Env. Yukon Parks.

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GOLDEN EAGLE SURVEYS ON DONNELLY TRAINING AREA IN INTERIOR ALASKA

Elizabeth Neipert and Matt Cameron, U.S. Army Garrison Fort Wainwright-Donnelly Training Area, Colorado State University-Center for Environmental Management of Military Lands

Golden Eagles (*Aquila chrysaetos*) are protected by the Bald and Golden Eagle Protection Act (BGEPA) and listed as a Priority Management Species in the United States Army Garrison Fort Wainwright (USAG-FWA) Integrated Natural Resources Management Plan. During the 2013 field season, Colorado State University (CSU) Center for Environmental Management of Military Lands (CEMML) conducted Golden Eagle surveys on Fort Wainwright's Donnelly Training Area using USFWS survey methods (Pagel et al. 2010). The surveys were conducted from a Robinson R-44 helicopter between 19 and 20 June, focusing on areas of historical use and known nest structures at Molybdenum Ridge, Black Rapids Training Area (BRTA), and Donnelly Dome. No new nests were identified over the entire survey area. Golden Eagles were not observed at either Molybdenum Ridge or BRTA during the aerial surveys. However on the south face of Donnelly Dome, new material decorated an old nest and 2 Golden Eagles were observed in the area.

Supplemental ground observations were collected throughout the remainder of the nesting season. A pair of Golden Eagles was observed at BRTA, the pair around Donnelly Dome was sighted throughout the remainder of the season and one additional individual was sighted around Molybdenum Ridge, none of which exhibited nesting behavior. While no new Golden Eagle nest structures or nesting behavior were observed in 2013, occupancy of all 3 known Golden Eagle territories was confirmed.

Literature Cited:

Pagel, J. E., D. M. Whittington, and G. T. Allen. 2010. Interim Golden Eagle technical guidance inventory and monitoring protocols; and other recommendations in support of eagle management and permit issuance. Division of Migratory Bird Management, U.S. Fish and Wildlife Service.

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DISTRIBUTION AND ABUNDANCE OF NESTING RAPTORS IN NORTHERN ALASKA

Robert Ritchie, ABR Inc.–Environmental Research and Services

Summaries below are for 2 projects related to abundance and distribution of nesting raptors in Northern Alaska

1. MELTING MUD MATTERS!

ABR performed helicopter-based occupancy surveys of cliff-nesting raptor species (Peregrine Falcon, Gyrfalcon, Rough-legged Hawk, Common Raven) for BLM. The 2013 report is in preparation.

2. Distribution and abundance of Nesting raptors for the proposed road to the Ambler Mining District, Northern Alaska

ABR performed helicopter-based occupancy surveys of cliff-nesting raptor species (Bald and Golden Eagle, Peregrine Falcon, Gyrfalcon, Rough-legged Hawk, Osprey, and Common Raven), For DOWL. The 2013 report is in preparation.

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RAPTOR SURVEYS AT LAKES IN THE OUMALIK-KOKULAK REGION, NPRA, ALASKA, JULY 2013 (BCR 3)

Robert Ritchie, ABR, Inc. and Debbie Nigro, BLM, Fairbanks, Alaska

Although there are records of Peregrine Falcons nesting on lakes in North America, they have rarely been identified on lakes in Alaska. In 2013 we continued a survey for lake bluff nesting

nesting Peregrine Falcons that was first conducted in 2012. In 2013 we surveyed 325 lakes for nesting Peregrine Falcons in the foothills of northeastern NPRA. This location was chosen because surveys in 1999 found peregrines nesting on lakes, and there were numerous lakes in the area. In 2012 we used a detailed 5-m Digital Elevation Model for the NPRA and lakes within the National Hydrological Dataset to select lakes >0.25 km^2 that had an elevation range ≥15 m along their shorelines. Additional review of aerial photography of the Arctic Coastal Plain and Foothills regions showed that numerous other lakes, particularly those in the eolian silt region at the southern extent of the Arctic Coastal Plain and west of the 2012 study area have similar suitable habitat features and provide nesting opportunities for Peregrine Falcons. Therefore, besides visiting lakes used by peregrines in 2012, we visited additional pre-selected lakes (>25 hectares) with shoreline relief >15 m between the Topogaruk River and the Kuk River in 2013. During helicopter surveys in July 2013, we recorded Peregrine Falcons at 21 lakes, including 15 pairs of which 11 were successful. All nesting pairs were on thermokarst lakes near the Ikpikpuk River. Lakes with steep, eroding aeolian silt banks, underlain by rapidly degrading permafrost with islands of drier soil, were used for nesting. Peregrine observations were limited at lakes east of the Ikpikpuk River where bluffs are better drained. However, nonbreeding Gyrfalcons and Golden Eagles were recorded regularly throughout the study area.

Summary and Recommendations:
Peregrine Falcons regularly nested on lakes in the Oumalik subregion, west of the Ikpikpuk, an area with numerous steep-sided, thermokarst lakes. This lake type seems to correspond closely with the presence of eolian silts and rapidly degrading ice-rich permafrost (Yedoma). Peregrines were not found successfully nesting on other deep lakes east of the Ikpikpuk River (eolian sands).

In 2014 we recommend revisiting the area surveyed in 2013 using a smaller helicopter (R-44) in order to better determine nest site locations and nesting success of Peregrine Falcons.

We were surprised to record so many Gyrfalcons at lakes in the study area and recommend continuing to assess their relative abundance in the study area. Improved estimates of age, sex, and color phase of Gyrfalcons would also be beneficial.

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ALASKA PENINSULA/BECHAROF NWR LANDBIRD PROJECTS—2013

Susan Savage, U.S. Fish and Wildlife Service, Alaska Peninsula/Becharof NWR; and Sherri Anderson, National Park Service, Katmai National Park and Preserve

Below is a summary of several landbird projects (grouped by project theme) for the Alaska Peninsula/Becharof NWR:

Inventory and Monitoring:

1. Pilot Study: Establishing baseline Owl species presence and abundance, King Salmon, Alaska (BCR 2)

During winter 2013 we conducted road-based surveys of boreal forests owls from Lake Camp (Katmai National Park) to King Salmon. This is the second year of surveys and this year's main objective was to test a new survey protocol which included a 5 minute silent listening period followed by playback of 2 species: northern saw-whet owl and boreal owl. We also modified the route slightly to include only 10 stops, began surveys 60 min after sunset, and followed condition recommendations of Andres (2001). We completed 5 surveys from 17 February to 10 May with the first survey being a listening only survey. Over the course of all surveys, we made one detection of northern saw-whet owl (on 10 May), 2 detections of boreal owl (17 February, 10 May), and ten detections of great-horned owl (over multiple surveys). Note that northern saw-whet owl was detected at a stop where great horned owls were not detected over the course of the survey. We plan to repeat surveys in winter 2014 using this protocol. The final results will be presented in a progress report available from the PIs.

Literature Cited:

Andres, B. 2001. Suggestions for Breeding Owl Surveys in Alaska. Boreal Partners in Flight Working Group. Anchorage, Alaska.

2. Pilot Study: Willow Ptarmigan, Alaska Peninsula, 2013

Land managers, sport and subsistence hunters, climate change scientist, and predators all have an interest in willow ptarmigan populations. In 2011 the Alaska Peninsula/Becharof NWR (Refuge) embarked on a project to examine at minimum, relative abundance of willow ptarmigan across the lowlands of the Alaska Peninsula from the Naknek River to Port Moller. Recommendations from members of BPIF lead the PIs to switch from point transect surveys to line transect surveys and in 2012 we conducted 13 line transect surveys from the Naknek River drainage to Ugashik to test this method. In 2013 we implemented the line transect survey, but reduced our area of interest to the area from the Naknek River to the Upper Ugashik Lake area.

Starting on 1 May through 1 June 2013 we conducted 18 line transect surveys from 9 general locations. Survey areas were located at accessible airstrips south of King Salmon or along accessible roads. Eight surveys were located randomly while the others followed the path of surveys conducted in 2012 or were located to avoid large obstacles (e.g., uncrossable rivers, large lakes) in the field. Surveys began shortly after sunrise, unless fog prevented seeing ptarmigan. All surveys but one were approximately 4 km in length. Each ptarmigan sighting was recorded including distance from observer (visuals measured with a range finder, aural observations estimated within ranges), azimuth, number of birds, and several descriptors of behavior, habitat, detection criteria, and molt. Other species of birds were also tallied without further information.

We used ArcGIS 10.0 to plot each ptarmigan location and calculate distance from the transect line. We then used Distance Analysis (Buckland et al. 2001; Distance 6.0 Release 2) to obtain a density estimate of 0.27 (95% CL 0.21–0.35) male ptarmigan / hectare. In 2012 our sample of 13 transects resulted in an estimate of 0.15 (95% CL 0.09–0.26) male ptarmigan/hectare. Because we could not obtain a random sample in either year due to serious logistical challenges, the

estimate applies only to the areas around the eight accessible areas visited. Further analysis of ptarmigan use of land cover types and incidental species is ongoing.

The Refuge plans to incorporate the ptarmigan survey using this method into its Wildlife Inventory and Monitoring Plan with surveys occurring every odd spring to avoid logistical conflicts with spring bear season. Lessons learned in 2013 will be applied also to try to increase the sample of transects to 20–24. The final results will be presented in a progress report available from the PIs.

Literature cited:

Buckland, S. T., D. R. Anderson, K. P. Burnham, J. L. Laake, D. L. Borchers, and L. Thomas. Introduction to Distance Sampling. Oxford University Press Inc., New York.

Outreach and Monitoring

1. Cavity Nesting Bird Workshop and Nest Box Monitoring

On 20 April, USFWS staff and volunteers engaged 11 kids and 5 parents in a workshop about cavity nesting birds. The day started with a presentation informing the participants about the biology of tree swallows and chickadees and their use of artificial nesting cavities. Then the participants put together boxes that were pre-cut and drilled by Maintenance Worker Payne. Each child participant departed with their box and was encouraged to monitor the box using the protocol available at Cornell's Nest Watch webpage (http://nestwatch.org/).

During the summer, Refuge staff monitored boxes on the Refuge compound in King Salmon and at employee housing units and for the sixth year, contributed this data to Nest Watch. Seven boxes were monitored, but only 6 were active. Tree swallow nests began fledging around 7 July and continued through 18 July; mean first egg date (1 June) was one day ahead of the 6-year mean (2 June). A total of 34 eggs were laid, 33 young hatched, and 31 young fledged resulting in a hatch rate of 97% a fledge rate of 94% and a nest success of 91%.

Contributions to Other Region-Wide Projects:

Breeding Bird Survey, 8 June 2013, King Salmon (Lake Camp to Kvichak Bay)
ALMS/ORPC: 2 ALMS blocks completed (Lower Ugashik Lake [#14880, 11–14 June] and South King Salmon River [#14637, 15–18 June]). This is the second visit to each of these blocks which were established in 2011. Completed a 13 point ORPC along the Kanatak Trail to include some higher elevation areas. (Refuge specific progress report available)
Christmas Bird Count (16 December 2012, 858 birds of 15 species/species groups)
International Migratory Bird Day/North American Migration Count (11 May 2013, 6,795 birds of 69 species)

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DISTRIBUTION, ABUNDANCE, PRODUCTIVITY, WINTER CONCENTRATIONS AND MIGRATION OF RAPTORS AT THE PROPOSED SUSITNA-WATANA HYDROELECTRIC PROJECT, INTERIOR ALASKA

John Shook, Joe Welch, and Robert Ritchie, ABR Inc.–Environmental Research and Services

ABR performed helicopter-based occupancy, productivity, and winter roost surveys of cliff- and tree-nesting raptor species (Bald and Golden Eagles, Peregrine Falcon, Gyrfalcon, Rough-legged Hawk, Red-tailed Hawk, Common Raven) for the Susitna-Watana Hydroelectric Project. They also performed spring and fall migration watches at a number of locations. The 2012 report is available to the public on the Susitna-Watana project website: http://www.susitna-watanahydro.org/. This project is scheduled to continue for one more year (2012–2014).

POST-CONSTRUCTION MORTALITY MONITORING FOR THE GVEA EVA CREEK WIND PROJECT, INTERIOR ALASKA

John Shook and Robert Ritchie, ABR Inc.–Environmental Research and Services

ABR conducted Post-Construction Mortality Monitoring for the GVEA Eva Creek Wind Project, Healy, Alaska. They performed ground-based searches for downed birds and conducted experiments to determine scavenging and searcher efficiency rates. The 2013 report is in preparation.

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BIRDS 'N' BOGS CITIZEN SCIENCE PROJECT IN THE ANCHORAGE AND MATANUSKA VALLEY AREAS, ALASKA

Audrey Taylor and Tess Forstner, University of Alaska Anchorage; Nils Warnock and Beth Peluso, Audubon Alaska

In spring 2013, Audubon Alaska and the Geography and Environmental Studies Department at the University of Alaska Anchorage initiated a new citizen science program called "Birds 'n' Bogs." The goal of this program is to document distribution of boreal birds—primarily Lesser Yellowlegs (*Tringa flavipes)*, Greater Yellowlegs (*Tringa melanoleuca*), Solitary Sandpiper (*Tringa solitaria*), Rusty Blackbirds (*Euphagus carolinus*), Olive-Sided Flycatchers (*Contopus cooperi*), Tree Swallows (*Tachycineta bicolor*) and Violet-Green Swallows (*Tachycineta thalassina*) —in wetland habitats of Anchorage and the Matanuska Valley. This citizen science program represents an important effort because boreal wetland birds are among North America's most rapidly declining avifauna. The citizen science portion of the projected cooperated with a

U.S. Geological Survey (USGS) study by reporting resightings of banded Lesser Yellowlegs that nest the Anchorage area.

Boreal ecosystems are also disappearing or changing both globally and locally, which in turn can impact the birds that utilize these habitats. Incidental evidence suggests that bog and wetland habitat within the urban Anchorage area is declining due to development. Other threats to boreal wetlands in Southcentral Alaska include extraction and development of oil and gas resources and hydropower development projects such as the Susitna Dam Project. Of additional concern for boreal bird species are the uncertain effects of climate change on breeding habitat and breeding success. The boreal forest in particular is already impacted by higher temperatures, shifting seasons, more frequent and intense forest fires, and insect outbreaks.

This program relied on citizen scientists to perform a series of surveys for target species across a set of predetermined wetlands in Anchorage and the Matanuska Valley to monitor distribution and abundance of boreal birds. Survey locations in Anchorage were based study sites from a previous study by Lee Tibbitts (now with the USGS) of presence of Lesser Yellowlegs in bogs within the Anchorage area. Twenty-five participants surveyed 32 wetlands totaling over 57 person-hours. These data were then compiled using ArcGIS to create maps showing locations of the target species through time.

As this is the first year for the Birds 'n' Bogs citizen science program, we will use this information as a baseline for future surveys, the results of which will enable us to assess preferred wetlands and distribution patterns for each species within the Anchorage Bowl. This year gave us much insight into ways to improve survey protocols and select locations for future efforts.

We also learned that shorebird habitat in the Matanuska Valley is abundant and diverse and would require substantial additional effort to survey as thoroughly as participants accomplished in the Anchorage area. However, because we did observe a number of our target species, we believe a systematic survey of all wetlands in the Matanuska Valley (as was done for Anchorage) would yield valuable data on boreal species in these habitats, which could then be compared over time and with Anchorage data.

This survey represented a commendable effort by all participants and we anticipate repeating and expanding the effort in 2014, with the goal of establishing a long-standing monitoring program for declining boreal bird species.

Table 1. Total number of target bird species seen and heard in the Greater Anchorage area (excluding Matanuska Valley sites, where there were too few survey sites to determine trends) 15–25 May 2013. LEYE = Lesser Yellowlegs, GRYE = Greater Yellowlegs, OSFL = Olive-Sided Flycatcher, RUBL = Rusty Blackbird, SOSA = Solitary Sandpiper, TRES = Tree Swallow, and VGSW = Violet-Green Swallow. A number followed by a + indicates at least that many individuals were seen or heard but more may have been present.

Species	**LEYE**	**GEYE**	**OSFL**	**RUBL**	**SOSA**	**TRES**	**VGSW**
Early Period (May 15–18)							
Seen	43	6	0	8	5	138+	35+

Heard	18+	0	0	1	4	0	0
Middle Period (May 19–21)							
Seen	23	4	1	6	10	73+	12+
Heard	9	1	0	0	0	0	0
Late Period (May 22–25)							
Seen	10	0	1	8	2	128+	40+
Heard	5	0	0	7	2	0	2

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BLOOD PARASITES IN LANDBIRD HOSTS IN A CHANGING ARCTIC ENVIRONMENT

Caroline Van Hemert and Colleen Handel, USGS Alaska Science Center

Prevalence and transmission of parasites in avian hosts are influenced by a variety of factors, including local environmental and climatic conditions. The Seward Peninsula occupies a key transitional zone between Arctic and boreal environments and is undergoing rapid ecological change associated with climate warming. Distribution and transmission of blood parasites is thought to be influenced by temperature and future changes have been projected in response to climate warming. However, little baseline information exists for passerines in northern regions. We are currently investigating the prevalence and diversity of blood parasites in passerine species on the Seward Peninsula. In 2013 we collected more than 300 blood samples from 20 species and we plan to continue sampling for an additional year. This study will allow us to evaluate relationships between habitat, host factors, and rates of infection and to evaluate patterns of local transmission in a changing Arctic environment.

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DEVELOPING A DECISION SUPPORT TOOL FOR LAND USE PLANNING ON THE KENAI PENINSULA, ALASKA

Nathan Walker, GIS Biologist, and Melanie Smith, Science Director, Audubon Alaska

Commonly, conservation organizations and land trusts perform land prioritization analysis to guide their conservation strategies. This often involves the use of a GIS analysis to overlay various resource layers, and rank land units according to their importance based on stakeholder

input. Although this approach can be effective, it is typically not very flexible. Organizational priorities change as new grants become available, staff change, or the political context shifts. Furthermore, the results of any prioritization process differ depending on the stakeholders involved or the scale of analysis. Conservation strategies need to be continually updated to account for such changes, which calls for moving beyond a standard GIS to a dynamic decision support tool framework.

We created an interactive, online tool for the Kenai Peninsula in Alaska. The tool was developed in consultation with representatives from a local land trust, the Kenai National Wildlife Refuge, other conservation organizations, and the Kenai Borough, to ensure that the data and decision parameters would be meaningful to local decision-makers. We used the Javascript API with ArcGIS Online to create an interface that allows users to dynamically allocate weights to various resource layers, and rapidly identify areas of interest based on different scoring scenarios. This tool allows users to identify priorities at various scales, from watersheds and subwatersheds down to the parcel level, allowing for decisions to be based on ecological and/or administrative boundaries. We included data on rivers, wetlands, fish, birds, vegetation, climate change, and development, as well as other relevant factors such as parcel size and cost. Users can quickly reassess their land priorities to account for changing circumstances, and experiment with different scenarios. Because this tool was coded in a flexible framework using commonly available datasets, this approach should be broadly applicable for land-use planning elsewhere.

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Main partners for the project are Kenai Heritage Land Trust, Kenai National Wildlife Refuge, Cook Inletkeeper, and Kenai Watershed Forum. Other partners/major data providers include Alaska Department of Fish and Game, Homer Soil and Water Conservation District, Kenai Peninsula Borough, Natural Resources Conservation Service, Scenarios Network for Alaska & Arctic Planning (through University of Alaska Fairbanks), and U.S. Environmental Protection Agency.

See Figures 1 and 2 for sample maps.

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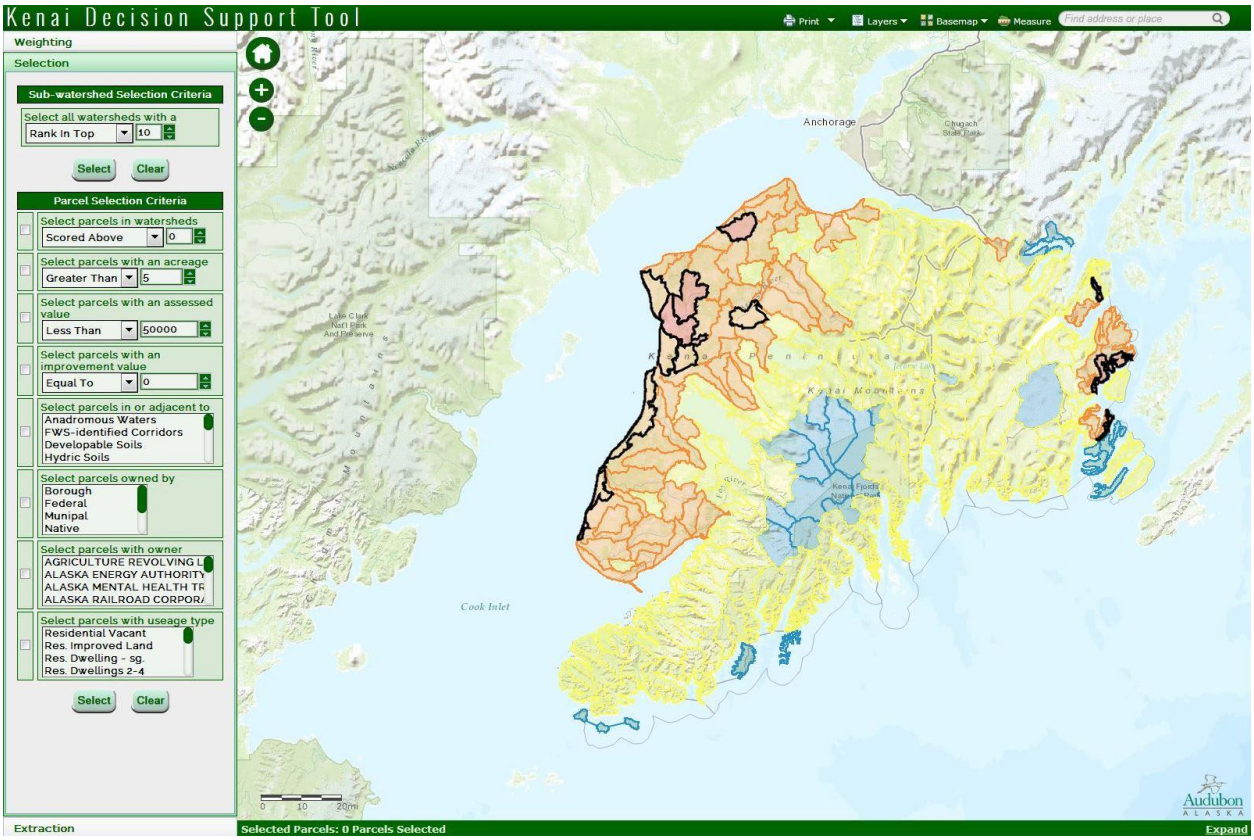

Figure 1. Colors show weights applied to watersheds based on selected criteria. Black outlines show individual watersheds selected.

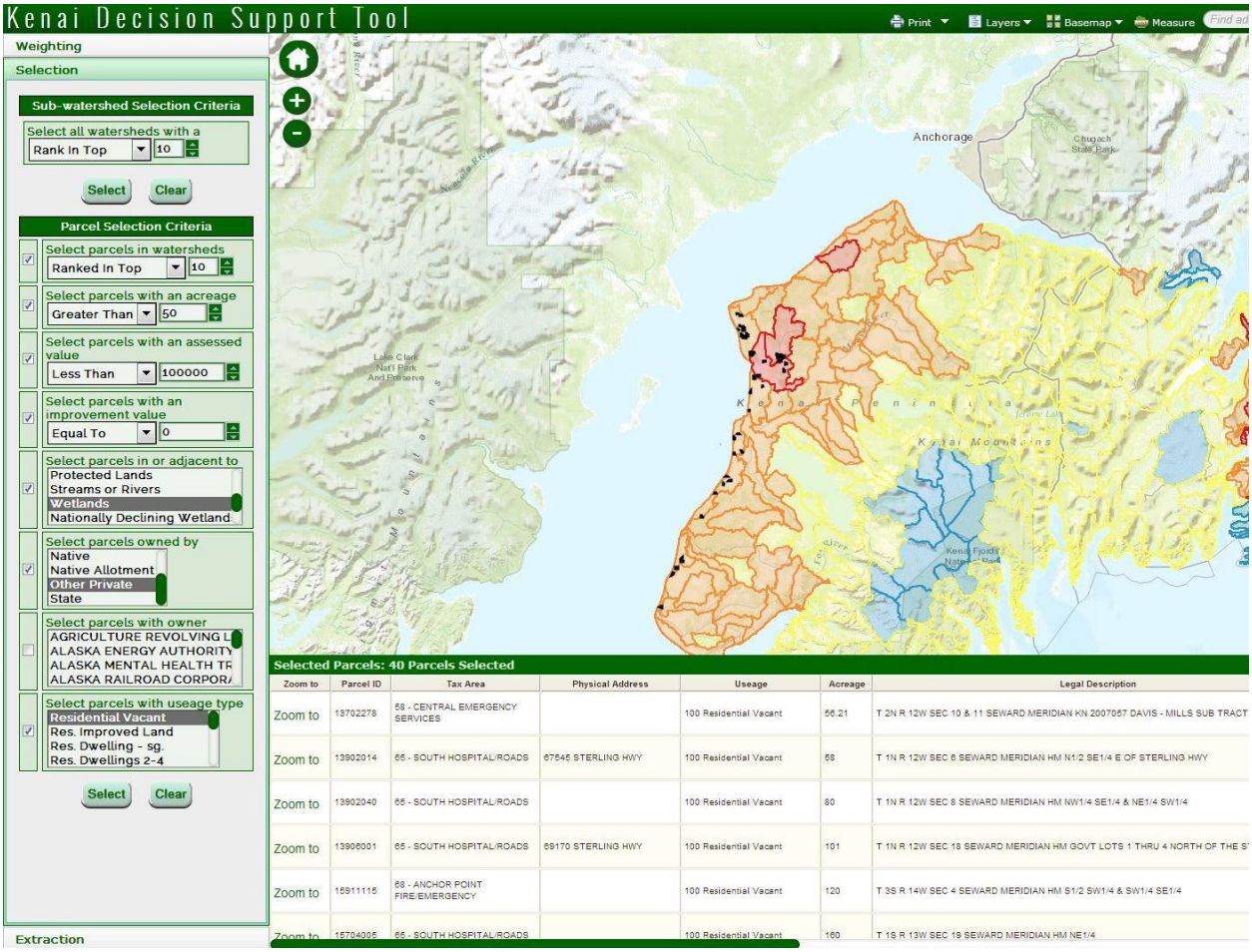

Figure 2. Selections shown at the land parcel level, with a popup of information about selected parcels.

APPENDIX 1. LIST OF LANDBIRD PUBLICATIONS IN 2012–2013 THAT WERE AUTHORED BY BPIF MEMBERS OR DEALT WITH SPECIES SHARED WITH BPIF.

Breeding Behavior, Ecology and Physiology

Harding Scurr, A. 2013. Mating system and social behavior of Rusty Blackbirds on Yukon Flats National Wildlife Refuge. M.S. Thesis, Humboldt State University, Arcata, California.

Hayward, L. S., E. E. M Moodie, and J. C. Wingfield. 2012. Patterns of yolk testosterone deposition in two populations of Arctic-breeding Redpolls. Journal of Ornithology 153:727–734.

Johnson, J. A., L. C. DeCicco, S. M. Matsuoka, and A. L. Sowls. 2013. Nesting ecology of McKay's Buntings on St. Matthew Island, Alaska. Wilson Journal of Ornithology 125:376–384.

Li, D., G. Wang, and J. C. Wingfield et al. 2012. A comparison of the adrenocortical responses to acute stress in cardueline finches from the Tibetan-Plateu, Arctic-Alaska and lowland Western North America. Journal of Ornithology 153:761–770.

Loomis, D. 2013. Reproductive success and foraging ecology of the Rusty Blackbird on the Copper River Delta, Alaska. MS Thesis. Oregon State University, Corvallis, Oregon.

Yoon, J., T. S. Sillett, S. A. Morrison, and C. K. Ghalambor. 2013. Male's return rate, rather than territory fidelity and breeding dispersal, explains geographic variation in song sharing in two populations of an oscine passerine (*Oreothlypis celata*). Behavioral Ecology and Sociobiology 67:1691–1697.

Disease, Parasites, and Contaminants

Dodge, M., Guers, S. L., Sekercioglu, Ç. H., and R. N. Sehgal. 2013. North American transmission of hemosporidian parasites in the Swainson's Thrush (*Catharus ustulatus*), a migratory songbird. The Journal of Parasitology 99:548–553.

Van Hemert, C., A. G. Armien, J. E. Blake, C. M. Handel, and T. M. O'Hara. 2013. Macroscopic, histologic, and ultrastructural lesions associated with avian keratin disorder in Black-capped Chickadees (*Poecile atricapillus*). Veterinary Pathology 50:500–513.

Habitat Assessment and Management

Tauzer, L. M. 2013. Recent changes in plant and avian communities at Creamer's Refuge, Alaska using field and remote sensing observations. MS Thesis, Department of Biology and Wildlife, University of Alaska Fairbanks.

Methods

Schmidt, J. H., C. L. McIntyre, and M. C. MacCluskie. 2013. Accounting for incomplete detection: What are we estimating and how might it affect long-term passerine monitoring programs. Biological Conservation 160:130–139. http://www.sciencedirect.com.arlis.idm.oclc.org/science/article/pii/S0006320713000177

Sofaer, H. R., P. L. Chapman, T. S. Sillett, C. K. Ghalambor, and K. Cameron. 2013. Advantages of nonlinear mixed models for fitting avian growth curves. Journal of Avian Biology 44:469–478.

Sólymos, P., S. M. Matsuoka, E. M. Bayne, S. R. Lele, P. Fontaine, S. G. Cumming, D. Stralberg, F. K. A. Schmiegelow, and S. J. Song. 2013. Calibrating indices of avian density from non-standardized survey data: making the most of a messy situation. Methods in Ecology and Evolution, *in press*.

Migration Ecology

Barilein, F., V. Dierschke, J. Delingat, C. Eikenaar, I. Maggini, M. Bulte, and H. Schmalijohann. 2013. Revealing the control of migratory fueling: An integrated approach combining laboratory and field studies in northern wheatears *Oenanthe oenanthe*. Current Zoology 59:381–392.

Bulte, M., and F. Bairlein. 2013. Endogenous control of migratory behavior in Alaskan Northern Wheatears *Oenanthe oenanthe*. Journal of Ornithology 154:567–570.

Moran, J. A., L. I. Wassenaar, J. C. Finlay, C. Hutcheson, L. A. Isaac, and S. M. Wethington. 2013. An exploration of migratory connectivity of the Rufous Hummingbird (*Selasphorus rufus*) using feather deuterium. Journal of Ornithology 154:423–430.

Schmaljohann, H., F. Korner-Nievergelt, B. Naef-Daenzer, R. Nagel, I. Maggini, M. Bulte, and F. Bairlein. 2013. Stopover optimization in a long-distance migrant: the role of fuel load and nocturnal take-off time in Alaskan northern wheatears (*Oenanthe oenanthe*). Frontiers in Zoology 10:26.

Populations, Abundance, and Distribution

Gibson, D. D. 2012. On two fronts: Occurrence of the House Sparrow in Alaska. Western Birds 43:248–254

Gibson, D. D., S. C. Heinl, A. J. Lang, T. G. Tobish, Jr., and J. J. Withrow. 2013. Checklist of Alaska birds, 19th edition.

Hoglund, J., B.A. Wang, T. Axelsson, and M. Quintela. 2013. Phylogeography of willow grouse (*Lagopus lagopus*) in the Arctic: Taxonomic discordance as inferred from molecular data. Biological Journal of the Linnean Society 110:77–90.

Lait, L. A., V. L. Friesen, A. J. Gaston, et al. 2012. The post-Pleistocene population genetic structure of a western North American passerine: The chestnut-backed chickadee *Poecile rufescens.* Journal of Avian Biology 43:541–552.