2015 Summary of Landbird Projects For Boreal Partners in Flight

November 3, 2016

Individual project reports were merged and lightly edited by Gwen Baluss for Boreal Partners in Flight. For more information about each study, please contact the individual(s) noted at the end of the project summary.

For more information about Boreal Partners in Flight, see
http://alaska.usgs.gov/science/biology/bpif/index.php
For more information about Partners in Flight in the Americas see
http://www.partnersinflight.org/about/

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INTRODUCTION

Welcome to the 2015 Boreal Partners in Flight (BPIF) report, a listing of new, recently completed, and ongoing landbird projects in Alaska and Northwestern Canada. Thanks to each contributor and the tremendous effort the summaries represent.

BPIF has been bringing together government, researchers, educators, land managers, businesses, non-profits and interested individuals to work together on bird conservation since the first meeting in March 1992.

Past reports show the evolution of boreal bird studies and emergent issues. Included in this compilation are projects relevant to today's hottest topics in ornithology and environmental studies. Birds have long been considered "barometers" for environmental quality. As climate change's ecological effects become understood, boreal studies are already noting effects to the songbird community, and modeling for future scenarios of adaptation. This is a critical time for those concerned with high latitude landbirds.

It is also an interesting time for studying long-distance bird migration, as geolocators are elucidating migratory pathways in a way that is more detailed than most researchers could have imagined just a few years ago. Birds breeding in the far north may exhibit the planet's most extreme migrations, and we are on the brink of learning even more about their extraordinary journeys. Described in this report alone, geolocators have been deployed on 4 species—Olive-sided Flycatchers, Rusty Blackbirds, Swainson's Thrushes, and Gray-cheeked Thrushes—and more are planned for Arctic Warblers and Wilson's Warblers. Expect to hear about one or more of the BPIF projects in national science news or even mainstream media as new "champions" of songbird migration are described.

This year's summary contains 23 reports, some with multiple projects, detailing a range of activities including research, inventory, monitoring, environmental risk assessment, education and outreach. Projects focused on songbirds, multiple taxa, raptors, galliform birds, or hummingbirds. Investigations exhibited wide coverage, from Southeast Alaska to the Arctic. The most projects were conducted in Bird Conservation Region (BCR) 4, followed by BCR's 5

and 2. There was only one report that included BCR 3 and none for BCR 1. (For a BCR map see, Appendix 2).

Contributions came from government resource agencies, the private sector, academic institutions, non-profit organizations and interested individuals, with binational effort from Canada and the United States. There was widespread participation in broad scale multi-species surveys, involving multiple partners such as the Breeding Bird Survey and Alaska Landbird Monitoring System. Studies ranged in scale from local citizen science efforts to in-depth research with continent-wide implications. This range is truly representative of the collaborative and inclusive objectives for Partners in Flight.

If you study boreal birds, please help make future reports more complete by submitting a summary of any landbird work in the to the current BPIF chair (address below).

Finally, no report can cover the whole of on-going studies. The following sources may also be helpful.
A list of recent publications from BPIF members can be found in Appendix 1.
Other work is outlined in abstracts from the 2014 Alaska Bird Conference:
http://www.juneau-audubon-society.org/Alaska%20Bird%20Conference%202014.htm
Recent BPIF meeting notes and annual reports can be accessed via this link:
https://drive.google.com/drive/folders/0B3zAaptg-_rDQzRlTGdZbmgxaWM?usp=sharing

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PROJECTS BY BIRD CONSERVATION REGION

LANDBIRD MONITORING ON KODIAK ISLAND, ALASKA, 2015 (BCR 2)

Robin Corcoran[1], Cindy Trussell[2], and Rich MacIntosh[3]
[1]U.S. Fish and Wildlife Service, [2]Kodiak College, [3]Biological Consultant

Breeding Bird Survey – two road-system surveys (Kodiak II (231) and Chiniak (131)) were conducted in June 2015 by Cindy Trussell and Rich MacIntosh.

Christmas Bird Count – two counts were conducted, the Kodiak count circle (12/14/2014) and the Narrow Cape/Kalsin Bay count circle (1/3/2015). Counts were organized and data compiled by Rich MacIntosh.

Kodiak Refuge Monitoring Avian Productivity and Survivorship Program (MAPS) Program-The Monitoring Avian Productivity and Survivorship Program (MAPS) Program was established in 1989 to monitor spatial and temporal patterns in adult survival rates and productivity for populations of landbirds across North America. Over 1,000 MAPS stations have been established and operated, a large proportion of them providing many consecutive years of data. The MAPS program currently consists of nearly 500 monitoring stations sampled annually and the program provides estimates of adult apparent survival and recruitment rates and indices of productivity for about 150 landbird species (DeSante et al. 1995, 2004, 2007).

From 2010-2015, we established and annually operated a MAPS site at the Kodiak National Wildlife Refuge Headquarters on the Buskin River State Recreation Area along the Kodiak road system in Alaska. Following MAPS program guidelines, the station consisted of 10 mist nets distributed over a roughly eight-hectare (20 acre) area. Nets were operated one day during each of six consecutive 10-day periods between 10 June and 8 August. Nets were opened at official local sunrise and were left open exactly six hours. Habitat at the site was primarily mixed alder-willow riparian with some Sitka spruce upland. In six years of mist net operation, we captured and banded 1401 birds representing 20 species, and recaptured between years 89 individuals representing 11 species (Table 1). The most commonly caught species were Fox Sparrow, Hermit Thrush, Pacific Wrens, and Wilson's and Yellow Warblers. In general, across all seasons, non-migratory and short to medium distance migrants had higher productivity compared to long-distance migrant warblers.

One of the primary goals of the Kodiak MAPS project was communicating science and conservation to the public through bird banding. The core team of trained volunteers consisted of six to eight people, depending on the year, and often included seasonal staff and volunteers with the Kodiak Refuge Biological Program and Visitor's Center. In general, we had approximately 30 volunteers each season and 70 total participants across the six years. A cumulative total of approximately 1800 hours of service was donated to the refuge by volunteer participation in the MAPS program.

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Table 1. Summary of mist net captures of birds on the Kodiak Refuge Monitoring Avian Productivity and Survivorship (MAPS) site on the Buskin River State Recreation Area, Alaska, in summer 2010 to 2014.

	Year*								
Species	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Total**	**No. Recaptured Between Years**	**Mean Hatch Year to Adult Ratio**
Fox Sparrow	46	44	33	48	58	80	309	24	1.6
Hermit Thrush	52	41	47	30	43	42	255	22	2.2
Wilson's Warbler	76	26	29	16	29	42	218	14	0.3
Pacific Wren	16	24	0	1	21	59	121	2	0.4
Yellow Warbler	29	15	26	23	8	13	114	12	0.2
Golden-crowned Kinglet	3	27	0	0	4	63	97		1.8
Pine Siskin	1	12	3	12	0	30	58		
Black-capped Chickadee	13	5	5	10	7	17	57	6	1.9
Varied Thrush	3	12	9	12	2	5	43	2	1.1
Pine Grosbeak	1	5	4	10	2	4	26	3	
Brown Creeper	0	0	1	4	2	12	19	2	
Red-breasted Nuthatch	2	2	2	7	1	5	19	1	
Orange-crowned Warbler	7	3	2	2	4	0	18		
Common Redpoll	0	1	0	0	0	14	15		
Golden-crowned Sparrow	6	0	1	2	0	0	9		
Red Crossbill	0	0	0	0	1	7	8		
Downy Woodpecker	1	0	0	0	4	1	6		
Myrtle Warbler	1	0	2	2	0	0	5		
Song Sparrow	2	0	0	0	0	1	3		
Three-toed Woodpecker	0	0	0	1	0	0	1	1	
TOTALS	**259**	**217**	**164**	**180**	**186**	**395**	**1401**	**89**	
Total Net Hours	*371*	*341*	*358*	*357*	*347*	*355*			

*Yearly totals are for newly banded birds only; within- and between-season recaptures are not included.

PAST, CURRENT, AND PROJECTED CHANGES IN TERRESTRIAL BIRD POPULATIONS RELATIVE TO CLIMATE SHIFTS ALONG THE BOREAL–ARCTIC TRANSITION ZONE (BCR2, 3, 4)

Colleen M. Handel, Steven M. Matsuoka, Courtney L. Amundson, Sarah J. Thompson, Rachel M. Richardson and Lisa M. Pajot, USGS Alaska Science Center

North America's boreal and Arctic biomes are among the most rapidly warming regions on earth. The transition zone between these biomes is expected to undergo an ecological

transformation by the end of the century. In our recent studies in the transition zone we (1) detected substantial decadal shifts in avian communities that are consistent with climate-mediated transitions of tundra to shrub habitats, and (2) projected the current climate envelopes of boreal birds to shift dramatically northward, leading to large changes in avian communities in the transition zone by the end of the century (Stralberg et al. 2015a). In this next phase of research, which we began in 2015, we delve more deeply into the mechanisms of species' adaptive responses to climate change through two principal research components.

The first component is a field study on the Seward Peninsula, Alaska where we will identify the key ecological and demographic processes governing the numerical responses of terrestrial birds to the climate-mediated expansion of shrubs that is occurring across the subarctic. We will collect and then integrate data on avian abundance, demography, and resource selection (habitat and arthropod prey) to both understand how climate-mediated increases in shrub cover influence habitat quality and to identify the key demographic parameters and resources that govern species' adaptive responses to climate-mediate habitat change. We will then use our integrated model to simulate how future climate-mediated increases in shrub cover are likely to alter terrestrial bird populations via effects on avian demography, and the abundance of key resources.

The second component of our research is a modeling study in which we will forecast numerical responses by terrestrial birds to future projections of climate-mediated changes in fire, hydrology, permafrost, and plant succession across Alaska and northwestern Canada. We will use (1) outputs of future landscape change from a newly developed dynamically linked landscape model developed by the University of Alaska Fairbanks' Scenarios Network for Alaska and Arctic Planning (McGuire 2015), in combination with (2) a unique dataset of avian surveys from the Boreal Avian Modelling Project (Barker et al. 2015), to identify habitats, geographic areas, and bird species that will likely be most vulnerable to projected climate change across the landscape. Online products will include (1) species-specific maps that show current and projected breeding distributions and densities at 25-, 50-, and 75-year time frames, (2) maps of key areas of rapid population change and others that may serve as stable refugia, and (3) a synthetic vulnerability assessment of the characteristics of region's habitats, landscapes, and avian populations that render them most vulnerable to climate change.

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INVESTIGATION INTO RESPECTIVE DECLINES OF OLIVE-SIDED FLYCATCHERS AND WESTERN WOOD-PEWEES AT MULTIPLE SCALES (BCR 2 & 4)

Tara Stehelin, and Fiona K. A. Schmiegelow, University of Alberta @ Yukon College, Whitehorse, Yukon, Canada

Birds breeding in northern North America may experience one of the three greatest anthropogenic-caused temperature regime changes in the world. Long-distant and aerial insectivorous birds have been identified as some of the most vulnerable to population decline from climate change and recent habitat loss. Principle objectives of this 5-year study include 1) development of regional models to enhance national models conducted by the Boreal Avian Modelling project (BAM) to examine impacts of disturbance, climate and topographical wetness on abundance and distribution of Olive-sided Flycatchers and Western Wood-Pewees in the northern and western boreal (BCRs 4, 6, 10, 11) 2) to examine inter-annual variability and trends in relation to climate variability for each species in n and w boreal, and 3) to delineate northern edges of range for each species incorporating new data –as well as to compare with recent climate-constrained predictions for future range advancement (BAM, Stralberg et al. 2015), 4) to monitor breeding phenology and success on local pairs in s. Yukon of each species in relation to abundance of insects to examine potential for phenological disjunction 5) investigate migratory patterns in Olive-sided Flycatchers and Western Wood-Pewees breeding in Yukon.

This past year (2015) was the third field season in which breeding pairs were monitored for habitat preferences, breeding phenology and success, feeding preferences, as well as insect abundance and seasonal variation in insect phenology and abundance on breeding territories of Olive-sided Flycatchers and Western Wood-Pewees in southern Yukon. Capture and deployment of light-level geolocators (MigrateTech) was successful on only two Olive-sided Flycatchers in southwest Yukon in 2015. Territories of local Olive-sided Flycatchers were large (9.9 ± [SE] 1.3 ha), at mid-high elevation (916 ± 29 m asl, n = 34) and "open", sometimes in Sub-alpine Fir dominated areas near tree line. Territories of Western Wood-Pewees were smaller (1.2 ± 0.34 ha), at lower elevation (679 ± 24 m asl, n = 18), but also in open areas such as aspen-dominated parkland. Nesting success (at least one fledging) was high for OSFL in 2015 (0.81, Mayfield estimate, n = 12) and 0.62 for WEWP (n = 20). Early analyses of historical abundance suggest that Olive-sided Flycatchers may be increasing in Yukon since 1985, while Western Wood-Pewees are in decline, a different pattern from many other western regions. Observations of feeding behavior and insect sampling suggest that large insects such as dragonflies (Odonata) may be targeted by Olive-sided Flycatchers, whereas capture was more passive in Western Wood-Pewees and flies (Diptera) were mostly consumed, reflecting availability. Hatch dates coincided with peak insect abundance ($Abundance*Weight/Length*Day^{-1}$) for Western Wood-Pewees but Olive-sided Flycatchers may have shown a disjunction in 2014, although not in 2015.

This project is ongoing, but completion of objectives outlined here is scheduled for late 2016.

We acknowledge Boreal Avian Modelling project members, Yukon College, Yukon Research Centre, Canadian Circumpolar Institute and University of Alberta for financial support. Jesse Vigliotti provided able field assistance in 2015.

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WILLOW AND ROCK PTARMIGAN DISTRIBUTION AND MOVEMENT STUDIES IN SOUTHCENTRAL ALASKA, 2015 UPDATE (BCR 4)

Alaska Department of Fish and Game

Since 2013, the Small Game Program has initiated three separate ptarmigan radio collaring projects in Alaska. A Willow Ptarmigan project has been documenting movement patterns near the proposed Watana Hydroelectric Project Site in the upper Susitna River basin. A rock ptarmigan study has been documenting distribution and movement in Game Management Unit (GMU) 13B. Finally, beginning in spring 2014, a second Rock Ptarmigan study was initiated documenting movement and mortality patterns in the former study area of Robert Weeden near Eagle Summit along the Steese Highway.

The ADF&G and University of Alaska-Fairbanks (UAF) were able to secure financial support through the Alaska Energy Authority (AEA) to study Willow Ptarmigan distribution and movement near the proposed Watana Hydroelectric site as well as along the road access and transmission corridors. The Watana hydroelectric project could increase access for hunters to an area that is little known relative to its value for Willow Ptarmigan breeding, nesting, brood rearing, or overwintering habitat. Since May 2013, the ADF&G and a UAF graduate student have captured and radio-collared adult male and female Willow Ptarmigan each spring and summer. Collared birds have been monitored monthly to determine movement patterns. Capture and collaring work was completed in August 2015 and monitoring will continue through spring 2016. A final report should be available by spring 2017.

The ADF&G began radio collaring Rock Ptarmigan in GMU 13B in May 2013 due to a lack of information on demographic, movement, mortality rates, and brood productivity as well as hunters' desire to expand hunting opportunity in the area. Capture and collaring has occurred at locations along the eastern Denali Highway and several locations >10 miles from road access. Spring weather conditions made capture work in 2013 challenging. However, 25 collars were

deployed in 2014 and 33 so far in 2015. Collared individuals have been monitored bi-monthly documenting movement and mortality of this population. This project will continue through 2016 and has already increased our understanding of Rock Ptarmigan life history, mortality, and movement patterns.

Beginning in spring 2014, a third study was initiated along the Steese Highway examining the Rock Ptarmigan population near Eagle Summit. In May of 2014 staff completed an abundance survey of territorial male Rock Ptarmigan within Robert Weeden's former study area from the 1960s and 1970s. In spring 2015, a more comprehensive study was undertaken including the capture and radio collaring of adult male and female Rock Ptarmigan in the spring. This study plans to estimate rock ptarmigan abundance as well as movement, mortality, and brood production through the use of radio necklace collars (similar to the studies above).

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ANNUAL SUMMARY: NESTING ECOLOGY OF TREE SWALLOWS (*TACHYCINETA BICOLOR*) IN FAIRBANKS, ALASKA, 2015 (BCR4)

Tricia Blake and April Harding Scurr, Alaska Songbird Institute, Fairbanks, Alaska

Overview

The Tree Swallow Ecology Project was established in 1999 on Creamer's Field Migratory Waterfowl Refuge, Fairbanks, Alaska, as both a research and education program. Artificial nest boxes were monitored for productivity with varying amounts of effort over the years. In 2009 artificial nest boxes were also placed on University of Alaska Fairbanks (UAF) campus. In 2013, an additional 29 swallow boxes with a rectangular opening were placed in Creamer's Field hoping to attract nesting Violet-green Swallows. All locations have been monitored on an annual basis with similar methods and objectives since establishment. Banded Tree Swallows have been found to breed at both Creamer's Field and UAF during different years.

Monitoring

Tree Swallows nesting in artificial nest boxes in Fairbanks, Alaska were fairly successful in 2015 (Table 1). Average clutch size was 6 eggs, Creamer's Field averaging 5.9 eggs per nest (range 3-8 eggs), and UAF averaging 6 eggs per nest (range 4-8 eggs). Of these, 91.02% of all eggs hatched, Creamer's Field with 90.7% hatched, and UAF 91.4% hatched. We also had the earliest recorded first egg laid on May 18. No rectangular opening type boxes have been used for nesting except by Black-capped Chickadees.

Table 1. 2015 Summary of Tree Swallow Nesting Ecology in Artificial Nest boxes in Fairbanks, Alaska

	Creamer's Field	UAF	Total
# Available Nest Boxes	103	72	175
# Active Boxes	34	31	65
Occupancy Rate[1]	0.33	0.43	0.37
Mean Julian Lay Date	144	143	144
Mean Julian Hatch date	161	162	161
Mean Julian Fledge Date	182	182	182
Total # Eggs Laid	204	186	390
# Eggs Hatched	185	170	355
# Adults Banded New	27	28	55
# Adults Returns[2]	33	8	41
# Nestlings Banded	166	0	166
# of Nests that Fledged[3]	32	31	63

[1]Occupancy rate: the # of boxes occupied/# of available nest boxes

[2]Birds banded in a previous year, returned in 2015

[3]Fledged: fledged at least one nestling

Education and outreach

The Tree Swallow Ecology Project uses educational opportunities to conduct research and collect data. In 2015, data were collected by 11 students ages 10-17 in our youth mentoring program, and 3 students ages 15-17 in our high school internship program. High school interns earn a small stipend for their work. These 14 students volunteered at least 592 hours on the project. We also worked with one paid intern during the height of banding. Other educational components include:

- A historical summation of the project and recent findings were presented by students and an Alaska Songbird Institute staff member and the 18th Annual Tanana Valley Sandhill Crane Festival on August 30, 2015.
- A 7th grade class from Randy Smith Middle School, Fairbanks, Alaska, cleaned and cataloged the nest boxes in preparation for the 2015 nesting season as a service learning project.
- An Eagle Scout candidate from the local community built 24 replacement nest boxes for destroyed or damaged boxes, from materials he got donated.
- A local 8th grade student conducted an independent, student-led project where she presented the study to students and parents at her local school, and then constructed two new nest boxes to donate to the project.

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SUMMARY OF LANDBIRD WORK ON TETLIN NWR, ALASKA (BCR 4)

Kristin DuBour, Nate Berg & Dashiell Feierabend, U.S. Fish and Wildlife Service, Tetlin National Wildlife Refuge

1. *Spring Bird Phenology Surveys* – We conduct a thrice-weekly, road-based bird survey around Tok, AK each year between late March and mid-June. The purpose of this survey is to detect and document phenological shifts in peak bird migration through the Upper Tanana River Valley. This year we detected about 5500 individuals of 91 species between 13 April and 11 June at 23 established points. Common Redpoll, American Robin and Mallard were the most numerous species detected at 734, 409 and 392 detections, respectively. Rare but interesting species included Eurasian Wigeon and Gyrfalcon.

2. *Breeding Bird Surveys (BBS)* – We completed 4 road-based BBS routes this year (Tower Bluffs, Northway, Mt. Fairplay and Slana routes), June 9-13.

3. *Alaska Landbird Monitoring Surveys (ALMS)* – We completed 3 of our 7 ALMS plots this year (Northway, Fish Camp Lake and Tenmile Hill). These plots were last surveyed in 2013. In 2016 we plan to survey our four additional plots.

4. *Raptor Nest Occupancy and Productivity Surveys* – Between May and August 2015, we conducted aerial surveys of 45 bald eagle and 25 osprey nesting territories for occupancy and productivity. Results from 2015 indicate below average occupancy, success and productivity for bald eagles compared with the long term average (1991-2015). Occupancy was average while success and productivity were well below average for ospreys during 2015. In addition, we conducted ground-based occupancy and productivity surveys of 18 peregrine falcon territories. Peregrine falcon occupancy was average, with success and productivity above the long term average. The refuge will continue annual raptor monitoring with no further management actions planned.

5. *Fall Landbird Migration Monitoring (Banding Station)* – This was the first year in its 23-year history that the Tetlin bird banding station was not in operation. We could not operate the station this year due to staffing shortages (two employees on maternity leave!).

6. *Olive-sided Flycatcher research project* – This was the second year in which Tetlin participated in a large-scale research project studying Olive-sided Flycatchers (OSFL) in Alaska. This project is a large-scale effort spearheaded by ADF&G and in cooperation with USFWS Migratory Bird Management. The purpose of the project is to identify overwintering and staging areas of migratory OSFL, provide insight into breeding habitat requirements and potential causes for deficits in reproduction and quantify biomass of aerial arthropods on established OSFL territories. From May 22 to June 30 a crew of three people located OSFL territories, captured OSFL and deployed arthropod traps on

and off Tetlin NWR. We located 7 OSFL territories and successfully deployed light-level geolocators on 8 birds (7 males, 1 female; including both members of one pair). In addition, we recovered one geolocator deployed on a male in 2014. Data from that unit will be analyzed this winter along with information from other OSFL recovered in Interior and Southcentral Alaska. In 2016, we will attempt to recapture birds marked in 2015 and deploy up to 7 pinpoint GPS units on OSFL. These units will allow us to more precisely identify important wintering and staging areas for migrating OSFL.

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ANNUAL SUMMARY: CREAMER'S FIELD MIGRATION STATION, 2015 (BCR 4)

April Harding Scurr and Tricia Blake, Alaska Songbird Institute, Fairbanks, Alaska

Overview:

The Creamer's Field Migration Station was established in 1992 in Fairbanks, Alaska, on Creamer's Field Migratory Waterfowl Refuge. Its objectives were to study migratory songbird ecology and provide opportunities for hands-on science education. The Creamer's Field Migration Station is open to the public during operational hours. We encourage people to see scientific methods in action, see a bird in-the-hand and ask questions. In addition, educational components of this project consist of: 1) scheduled school field trips for approximately 2,000 kindergarten through university students each year. Students learn about migratory ecology, research methods and bird conservation. 2) opportunities for supervised volunteers to collect and record data and help with daily operation of the project, 3) research and education internships and bird banding apprenticeships, and 4) availability of data for publications and student projects.

SUMMARY OF 2015 SEASON:

Research

In 2015 we were open from April 20 – May 22, and August 3 – September 25, weather permitting. Rainfall was above average in the Fairbanks area for both August and September resulting in reduced number of days we operated and lowered net hours. Capture information and return rates can be found in Table 1.

Table 1. Spring and Fall Captures of Birds at Creamer's Field Migration Station in 2015

	Banded[1]						
Species	Hatch Year[2]	After Hatch Year[3]	Total[4]	Returns[5]	Total[6]	Return Rate[7]	After Hatch Year Rate[8]
Alder Flycatcher	2	0	2	0	2	0.00	0.00
American Robin	9	13	22	5	27	0.19	0.67
American Tree Sparrow	57	13	70	0	70	0.00	0.19

Black-capped Chickadee	21	5	26	16	42	0.38	0.50
Blackpoll Warbler	21	4	25	0	25	0.00	0.16
Boreal Chickadee	3	3	6	1	7	0.14	0.57
Brown Creeper	1	0	1	0	1	0.00	0.00
Common Redpoll	7	101	108	0	108	0.00	0.94
Downy Woodpecker	1	2	3	0	3	0.00	0.67
Fox Sparrow	17	19	36	0	36	0.00	0.53
Golden-crowned Sparrow	2	0	2	0	2	0.00	0.00
Gray-cheeked Thrush	20	7	27	1	28	0.04	0.29
Gray Jay	2	0	2	0	2	0.00	0.00
Gambel's White-crowned Sparrow	17	7	24	0	24	0.00	0.29
Hammond's Flycatcher	4	12	16	4	20	0.20	0.80
Hoary Redpoll	0	1	1	0	1	0.00	1.00
Lincoln Sparrow	20	98	118	0	118	0.00	0.83
Myrtle Warbler	341	70	411	2	413	0.00	0.17
Northern Waterthrush	20	19	39	0	39	0.00	0.49
Northern Shrike	2	0	2	0	2	0.00	0.00
Orange-crowned Warbler	155	35	190	1	191	0.01	0.19
Ruby-crowned Kinglet	36	6	42	1	43	0.02	0.16
Rusty Blackbird	1	8	9	0	9	0.00	0.89
Savannah Sparrow	26	9	35	0	35	0.00	0.26
Slate-colored Junco	90	49	139	4	143	0.03	0.37
Solitary Sandpiper	0	2	2	0	2	0.00	1.00
Sharp-shinned Hawk	3	0	3	0	3	0.00	0.00
Swainson's Thrush	130	58	188	1	189	0.01	0.31
Varied Thrush	7	1	8	0	8	0.00	0.13
Wilson's Warbler	26	15	41	0	41	0.00	0.37
Yellow Warbler	15	4	19	0	19	0.00	0.21
Total	1056	561	1617	36	1653	0.02	0.36

[1]Newly banded birds

[2] Bird born during capture year

[3]Bird born in a previous calendar year

[4]Total=all new banded birds, including both Hatch Years and After Hatch Year birds

[5] Birds banded in a previous calendar year and recaptured in 2015, only recorded once even if multiple recaptures occurred in 2015

[6] Total of all banded birds + Returns

[7]Returns/(Total of All Banded Birds+Returns)

[8]((After Hatch Years of Banded Birds + Returns)/(Total of all new banded birds+Returns))

Education and outreach

This year's education and outreach efforts at the Creamer's Field Migration Station directly served at least 2,334 people. Many more were reached through public outreach including a large display at the Noel Wien Library (Fairbanks) during migration, media articles, and public service announcements. Direct programs included:

- 72 K-12 classes (1,802 students, teachers, and parent chaperones) from the Fairbanks North Star Borough and Delta/Greely School Districts.
- A lab session for a Principals of Wildlife Management course from the University of Alaska, Fairbanks
- A training program for volunteer naturalist walk leaders at Creamer's Field Migratory Waterfowl Refuge
- 45 community volunteers of all ages who together contributed 1,314 collecting data, banding birds, and assisting with education programs.
- 4 guided walks to the station during fall migration.
- 2 large community events: an open house during the Spring Migration Celebration on Creamer's Refuge (this is the refuge-wide celebration of International Migratory Bird Day); and a Bird Banding Breakfast during the 18th Annual Tanana Valley Sandhill Crane Festival.
- 3 bird banding/education internships.

Acknowledgments:
Thank you to the Alaska Department of Fish and Game for allowing us to conduct our research on Creamer's Field Migratory Waterfowl Refuge, to our many volunteers for their hard work, and to all our Adopt-a-net sponsors and ASI members for funding the project.

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LANDBIRD PROJECTS FOR KANUTI NATIONAL WILDLIFE REFUGE, ALASKA, 2015 (BCR 4)

Chris Harwood, U.S. Fish and Wildlife Service; Kanuti National Wildlife Refuge

There were three landbird-related projects that occurred on Kanuti NWR in 2015.

1) Raptor stick nest survey
In May Refuge staff attempted to replicate an aerial survey for raptor stick nests last done in 2013. Fewer nests were located this year. We attributed the decline in observations to poor survey conditions (e.g., very little snow cover) and to a less experienced crew (i.e., both the pilot trainee and observer [mentor pilot] were new to stick nests surveys). We hope to do the survey in 2016 under better conditions.

2) Breeding Bird Surveys (BBS)

We completed one of two river-based BBSs (i.e., "Kanuti Lake," but not the "Kanuti Canyon," route) along the Kanuti River in June. We recorded 610 individuals of 43 species on the Kanuti Lake survey. We had to abort the Canyon survey due to boat motor issues. In stark contrast to last year's high water levels, river levels in June 2015 were the lowest in the crew's experience.

3) Post-fire landbird survey
We conducted point count and bird habitat surveys in June according to ALMS protocols at two post-fire sites. These two sites ("Kilolitna North" and "MingMinn") are "half-ALMS" plots (i.e. 12 points vs. 25). This year's effort, now 10 years removed from the 2004 and 2005 wildfires that burned a large part of the Refuge, repeated surveys first done in 2008 (MingMinn) and 2009 (Kilolitna North) and explores possible changes in bird numbers and habitat observed since. A complementary, repeat intensive survey of vegetation at the Kilolitna North plot was completed by a separate crew in July 2015. During this survey, the crew documented the Refuge's first Pomarine Jaeger. A repeated vegetation survey of the MingMinn plot was cancelled because of severe smoky conditions from nearby wildfires. Revisits to additional post-fire plots are planned for 2016.

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INVESTIGATING MIGRATION PATTERNS OF THE RUSTY BLACKBIRD USING LIGHT-LEVEL GEOLOCATORS AND STABLE ISOTOPES (BCR4)

James A. Johnson[1], Luke DiCicco[1]; David F. Tessler[2], Marian Snively[2]; Carol R. Foss[3], Patricia J. Wohner[3], and Keith A. Hobson[4]

U.S. Fish and Wildlife Service[1], Alaska Department of Fish and Game[2], New Hampshire Audubon[3], Canadian Wildlife Service[4]

We fitted 17 Rusty Blackbirds (*Euphagus carolinus*) with light-level geolocators in 2009 to track migration between nest sites in Anchorage, Alaska, and wintering grounds in the conterminous United States. We recaptured three of these birds in 2010. Each took similar Central Flyway routes not previously described for this species on both southward and northward migrations, and used a series of stopover sites across the prairie region from southern Saskatchewan to Iowa on their southward migration. Wintering areas spanned South Dakota to northern Louisiana. Upon retrieval, we found the geolocator attachments had loosened and abraded away the surrounding feathers on the three birds. Despite the continuing need to understand migratory connectivity in the context of this species' decline and the novel results from these birds, the abrasion coupled with the low return rate for instrumented birds (18%) prompted us to curtail geolocator studies until a smaller device and better harness was developed. Since then, improvements have shrunk the total instrument package by 50% to 1.0g (1.7% of blackbird mass), and added a degree of harness elasticity with a much finer material. In 2014 we deployed 10 geolocators on adult rusty blackbirds at nest sites in Anchorage, Alaska, and 11 geolocators on breeding blackbirds in Wentworth, New Hampshire. No geolocators were recovered from Anchorage in 2014.

In 2015 in Anchorage, we fitted PinPoint GPS units on 5 blackbirds. Although slightly heavier than Geolocators (1.0 g pinpoint vs. 0.75 g geolocators + 0.2 g each for harness), they provide very accurate location data (±5 m vs. ± 100 km). Geolocators were also fitted on 3 breeding blackbirds in Anchorage. Since PinPoints can record only 8 points due to weight controls Geolocators can record photoperiod data and can record thousands of points to give an overall track of bird's migration route. Each type of device garners different but complimentary forms of data. The Geolocator data helps us to program the PinPoint GPS the timing of when to take a point.

We are also pairing the geolocator movement study with concurrent analyses of stable isotope (deuterium and oxygen) signatures from feathers grown in wintering grounds following prealternate molt. We will use geolocator data to calibrate isotopic signatures of feathers collected during the recapture year and will compare those to isotopic signatures from feathers collected at deployment to determine if birds wintered in the same locations in both years.

This project is funded by the ADF&G Wildlife Diversity Program, USFWS Migratory Bird Management, and New Hampshire Audubon.

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UPDATE ON THE BOREAL AVIAN MODELLING (BCR 4)

Steve Matsuoka, USGS Alaska Science Center

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 over 210,000 point-count locations across North America's boreal forest region (Barker et al. 2015).

Analyzing these data is complicated because point-count survey protocols were not standardized across surveys throughout the region (Cumming et al. 2010, Matsuoka et al. 2014). 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, Sólymos et al. 2013). BAM has recent analyzed point-count data using these methods to (1) recommend standard protocols for conducting point-count surveys (Matsuoka et al. 2014), (2) evaluate distribution and abundance of 98 songbird species relative to current habitats and climates across boreal Canada (Cumming et al. 2014), (3) simulate the cumulative effects of land use and climate change on boreal songbirds in the oil sands region of Alberta (Mahon et al.

2014), and (4) simulate responses by 80 songbird species to future changes in climate across North America's boreal and subarctic zone (Stralberg et al. 2015a, b).

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. Spatially explicit models of species' distribution and abundance relative to current and future climates across the boreal are now available as maps on DataBasin (http://borealbirds.databasin.org).

BAM includes the following researchers:

Steering Committee: Erin Bayne, Steve Cumming, Fiona Schmiegelow, and Samantha Song
Staff: Nichole Barker (Program Manager), Trish Fontaine (Spatial Database Manager), Diana Stralberg (Ecologist), and Péter Sólymos (Statistical Ecologist).
Project Affiliates: Samuel Haché, Lisa Mahon, 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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MONITORING TRENDS IN ABUNDANCE AND OCCUPANCY OF PASSERINE BIRDS IN IN THE NPS CENTRAL ALASKA MONITORING NETWORK (BCR 4)

Carol McIntyre, Laura Phillips, and Greg Colligan, Denali National Park and Preserve; 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 Monitoring Network. In 2015, we continued to conduct standardized surveys in Denali National Park and Preserve (Denali) and Wrangell-St. Elias National Park and Preserve (Wrangell-St. Elias). Our work uses a repeat sampling method and is conducted on roadside survey routes along the Denali Park Road (n = 3 routes), the McCarthy Road (n = 2 routes), and the Nabesna Road (n = 1 route). Each roadside survey route contains 50 sampling points that are surveyed using a standardized 3-minute count. In 2015, we surveyed the routes 6 to 14 times between 9 April and 30 June. The number of species detected on each route ranged from 42 to 60, with the most species detected on the Nebesna Road in Wrangell-St. Elias (n = 60 species) and route 3 along the Denali Park Road (n = 52 species). We detected 98 species across all routes. We continued to detect singing male Tennessee Warblers along the McCarthy Road, including one male in same stand of shrub willows (*Salix* sp.) where we detected one in 2014. We also detected a singing male Eastern Phoebe along the Nabesna Road on 14 June 2015. The bird was also observed on 15 and 16 June 2015 at the same location. Our surveys will continue in 2016.

Details about our sampling methods can be found in 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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CRITICAL CONNECTIONS PROGRAM FOR MIGRATORY BIRDS IN ALASKA'S NATIONAL PARKS (BCR 4)

Carol McIntyre and Laura Phillips, Denali National Park and Preserve; Iain Stenhouse, Biodiversity Research Institute; and Scott Weidensaul

Although Alaska's National Parklands encompass 54 million acres of wildlife habitats, animals are not constrained by jurisdictional lines and many move seasonally across land and water through a patchwork of protected and unprotected lands. The Critical Connections Program was initiated to provide essential information for conserving migratory species by linking research results directly to conservation and education effort. At this stage, the primary program objectives are to: 1) develop a thorough understanding of the year-round movements of Alaska's migratory birds; 2) use data collected on the breeding grounds, migration routes, and wintering areas to identify factors constraining survival and driving trends of Alaska's migratory birds; and 3) expand collaborative efforts to mitigate constraining factors and protect critical resources necessary to conserve Alaska's migratory birds.

We initiated the Critical Connections Program in 2014-2015 by deploying light-level geolocators on 12 Gray-cheeked and 19 Swainson's Thrushes in Denali National Park and Preserve. Field work was conducted 3-8 July 2015 by our team including NPS and cooperating researchers. We trapped Gray-cheeked and Swainson's Thrushes on their breeding territories using mist nets, decoys, and playbacks of species specific songs and alarm calls. In summer 2016, we plan to locate and recapture tagged thrushes and to deploy geolocators on additional species including Arctic Warblers and Wilson's Warblers in Denali.
Phillips, L. M., C. McIntyre, S. Weidensaul, and I. J. Stenhouse. 2015. Critical connections program for migratory birds in Alaska: 2015 program activities. Natural Resource Report NPS/DENA/NRR—2015/1087. National Park Service, Fort Collins, Colorado. This report is available in digital format from the Natural Resource Publications Management website (http://www.nature.nps.gov/publications/nrpm/).

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COMMON NIGHTHAWK (*CHORDEILES MINOR*) ACTIVITY PATTERNS AND HABITAT USE IN THE NORTHERN BOREAL FOREST (BCR 4)

Andrea Sidler and Mark Brigham, Department of Biology, University of Regina, SK

Due to steep and largely unexplained population declines, Common Nighthawks *(Chordeiles minor)* are listed as Threatened under Canada's Species at Risk Act (SARA). Despite the northern boreal forest (including the Yukon) representing a significant portion of their breeding distribution, little is known about the status of populations in this habitat as it remains virtually un-surveyed. The majority of nighthawk data comes from Breeding Bird Survey routes in southern parts of Canada. Nighthawks are challenging to study and require specialized surveys for effective detection as diurnal bird counts tend not to detect, or at best underestimate this species, due to their cryptic daytime roosting and crepuscular nature (active during twilight). The goal of this project is to increase our understanding of nighthawk habitat associations and activity patterns in the southern Yukon while contributing to the definition of 'critical habitat' (action item listed under the Federal Recovery Strategy) in the North. We completed the first of two field seasons in the summer of 2015. Our first objective is to assess what habitats nighthawks choose in the northern boreal forest. During June 7 – Aug 14, we conducted 15 roadside surveys (8.5 km long each), across a variety of habitats between Watson Lake and Dawson City, in which we assessed nighthawk abundance relative to forest age and vegetation characteristics. Ten of the survey sites were visited three times, the remaining five twice (due to time constraints). Surveys began 30 min before sunset and consisted of 10 min point counts (6 min listening, 4 min playback), spaced 500 m apart. Additional data on temperature, wind speed, cloud cover and moon illumination were recorded. Data on habitat characteristics were collected by conducting 40 vegetation assessments along each 8.5 km nighthawk survey route. Our second objective is to examine daily and seasonal nighthawk activity patterns in the northern boreal forest. Northern latitudes are characterized by a large variation in summer photoperiod, including the absence of a dark-night phase and an extended crepuscular period – all of which may significantly impact the activity patterns of these crepuscular birds. Because of this, current survey protocols, which target populations at southern latitudes, may be ineffective for accurately assessing nighthawk numbers in the North. To address this, we deployed five autonomous recording units (ARUs) which were programmed to actively record acoustic data beginning one hour before sunset, until one hour after sunrise (May 31 – Aug 27). The data recorded by these units are currently being analyzed. The overall results of this study will be reported following the conclusion of the second field season in 2016.

This project was funded by: University of Regina, Natural Sciences and Engineering Research Council of Canada (NSERC), Association of Canadian Universities of Northern Studies (ACUNS), Wildlife Conservation Society Canada and has received logistic support and loan of ARU equipment from Canadian Wildlife Service.

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REVEALING THE MIGRATORY PATH, WINTERING AREA, AND BREEDING HABITS OF OLIVE-SIDED FLYCATCHERS: MORE RESULTS FOR ALASKA (BCR 4, 5)

Julie C. Hagelin, Marian Snively, Alaska Department of Fish and Game; James A. Johnson Migratory Bird Management, U.S. Fish and Wildlife Service.

Overview: In 2013 we began a multi-year study of Olive-sided Flycatchers (*Contopus cooperi*) in Interior and south-central Alaska. We have used light-level geolocators, and (as of 2015) Pinpoint GPS units to identify key migratory corridors, stopover sites, and wintering areas for conservation efforts. Other research goals include: (1) characterizing nest chronology and success, (2) sampling aerial insects at breeding sites, as food availability is hypothesized to limit reproductive success (Altman and Sallabanks 2012), and (3) re-surveying historical breeding sites from Wright (1997) to document any changes in bird occupancy.

Summary of geolocator efforts: In 2015 we deployed a total of 38 units (28 geolocators, 10 Pinpoint GPS units) in Anchorage and Fairbanks. To date we have recaptured 11 units (3 of 8 [38%] deployed in 2013, and 8 of 27 [30%] deployed in 2014). Our data represent 10 males and 1 female (n= 3 males from Anchorage, and n=7 males and 1 female from Fairbanks).

As in previous years, birds recovered in 2015 showed no evidence of injury. Average mass of recovered birds was 1.7g greater than mass at deployment; only one bird was <1g below its deployment weight (range: -0.7g - 4.0g). Despite limited data, there is no indication of reduced breeding success for returning birds. We confirmed the successful return and reproduction of a banded male in Anchorage that had worn a geolocator during 2013-14 season. A mated pair in Fairbanks (each of which had carried a geolocator) were also among our earliest returns in 2015. This pair reared a full brood of 4 chicks that fledged within 1 day of the earliest fledge date recorded in 2015.
We are currently analyzing data from geolocator returns in collaboration with Michael Hallworth at the Smithsonian Migratory Bird Center. Two wintering areas have emerged, each of which was used by a mix of Anchorage and Fairbanks adults (Figure 1). Birds spend 2.5 times longer on wintering grounds (~177 days), compared to breeding grounds in Alaska (~70 days). Data recovered from a single breeding pair indicates the female wintered in the southern location of Figure 1, whereas the male wintered to the north. In fall, birds spend ~60 days migrating inland and down the east side of the Rocky Mountains, with important stops in Texas, southern Mexico, and Central America (Figure 2a). Spring migration is of similar duration, but Figure 1b highlights the importance of stops along the eastern coast of Mexico, the Pacific Northwest and western Canada.

Nest chronology: Table 1 summarizes nest data for 2013-2015 seasons by location. Nesting in Anchorage preceded Fairbanks by ~7–10 days in 2013 and 2014 only. 2015 was an exceptionally warm, early spring in the Interior, which likely contributed to early breeding in Fairbanks (Table 1). Nest chronology of Fairbanks birds fell within previously-reported data ranges (Wright 1997).

Nest success by location: Over the past three seasons, 15 of 19 nests (78%) fledged at least one nestling in Fairbanks, compared to 9 of 13 nests (69%) in Anchorage (Table 1). One nest in Anchorage force- fledged one of two chicks in 2015.

Historical site surveys, and insect data: We conducted a third season of 10-minute point counts at nine historical breeding areas in the Fairbanks area, previously studied by Wright (1997). The survey yielded no singing males for a third year, despite a protocol that maintains a high

detection probability (> 90% per point), based on detection distances and singing rates from Wright (1997). Surveys were repeated once per week over the three-week period of peak male singing (mid-May-early June) and included five points per site. Our method covered an estimated listening area of ~987 ha per site. At the end of the 2015 season, a single singing individual was detected one morning only near to one historical site. It is unlikely that the bird had bred at this location, or it would have been detected earlier in the season. We suspect the bird was moving through as part of fall migration.

We continued to collect aerial insects with hanging malaise traps and pollinator traps at both active and historical nest locations. University of Alaska, Fairbanks Insect Collection (D. Sikes) is presently identifying our samples from both trap types and comparing biomass and insect diversity among years and collection sites. Preliminary results indicate Fairbanks sites produce significantly more insect biomass, on average, than Anchorage. There was also an increase in insect biomass following hatching at Fairbanks sites in 2014. Work is ongoing, and patterns should be interpreted cautiously, as there appears to be substantial inter-annual variation. A final season of insect sampling will occur in 2016, and analysis is ongoing for 2015 samples.

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Table 1: Nesting chronology of Olive-sided Flycatchers in Anchorage (n=4 nests in 2013, n= 4 nests in 2014, n=5 nests in 2015) and Fairbanks (n=4 nests in 2013, n=5 nests in 2014, n=9 nests in 2015).

	Mean Date (range)			
	2013 (n=8 nests)	**2014** (n=9 nests)	**2015** (n=14 nests)	**Location**
First egg laid	3 June (28 May–14 June*)	5 June (28 May*–8 June)	6 June (29 May*–13 June*)	Anchorage
	13 June (05*–18June)	12 June (01*–21* June)	3 June (25 May*– 12 June*)	Fairbanks
Clutch size	4.3 eggs (4–5)	4 eggs	4 eggs (3–5)	Anchorage
	3 eggs (2–4)	3.4 eggs (3–4)	3.6 eggs* (3-4)	Fairbanks
Hatching	22 June (16 June–3 July)	17 June (12–17 June)	23 June (13 June*–1 July)	Anchorage
	30 June (22 June*–4 July*)	29 June (20June*–6 July*)	20 June (12 June*– 30 June*)	Fairbanks
Fledging	12 July (6–21 July)	5 July (1–5 July)	12 July (3 July–21 July*)	Anchorage
	20 July (12 July*–24 July)	17 July (9*–25* July)	10 July (29 June –21 July*)	Fairbanks

*Date back-calculated based on other data, such as number of eggs in nest, estimated chick age (per Jongsomjit et al. 2007), fledge date, etc. If eggs were not seen, brood size was used as proxy for clutch size.

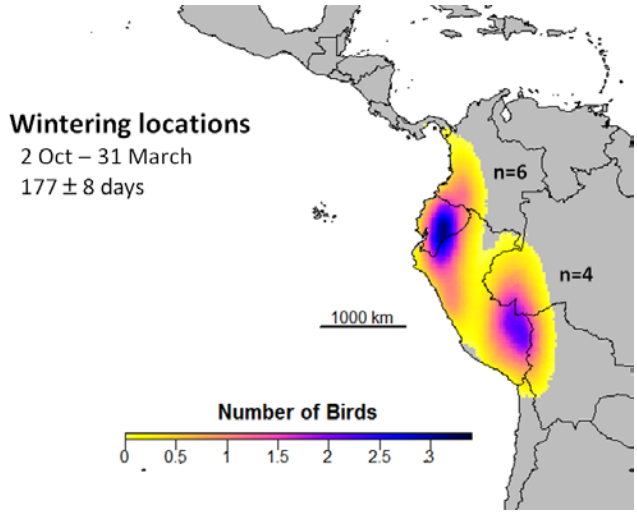

Figure 1: Wintering locations of n=10 adult Olive-sided Flycatchers from Anchorage and Fairbanks. Birds from each Alaskan region wintered in both the northerly and southerly locations. Although 11 geolocators were recovered over a two-year period (2014 and 2015), one unit failed to provide data, leaving 10 for analysis.

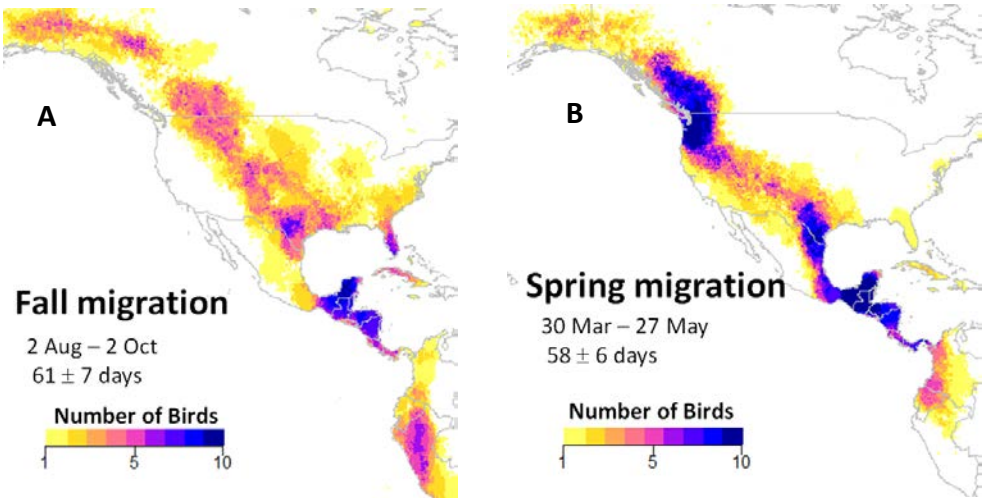

Figure 2a,b. Migratory path of n=10 Alaskan Olive-sided Flycatchers in fall (2013 & 2014) and spring (2014 & 2015).

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TONGASS RUFOUS HUMMINGBIRD PROJECT, 2015 SEASON (BCR 5)

Gwen Baluss, 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.

In 2015 we repeated effort initiated in 2013 and 2014 banding 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. We banded at two sites near Juneau Alaska: Jensen-Olson Arboretum (JOAR) and Juneau Community Garden (JCGA). Effort was repeated as close as possible to the dates and times in previous years. Sites were generally run on consecutive or within two days apart to allow comparison between the two sites. While the USFS was able to provide time for the licensed bander, at least 50% of this effort was contributed by volunteers.

In total, we safely banded in 2015: 93 adult females, 69 adult males, 6 hatch-year males and 10 hatch-year females. This is an increase of adults and decrease of young birds compared to 2014 where, with similar effort, we caught 128 hummingbirds: 39 adult males, 57 adult females, 21 hatch-year males, and 11 hatch year females.

To date, recaptures have yielded only 2 foreign encounters: 0.75 mi (June) and 1.5 mi (July) both were adult females at JCGA. Returns rates of adults from previous years to be recaptured at the same location were 4.5% for JCGA and 9.7% for JOAR. Additionally, one male and one female banded as juveniles returned as adults. This was an interesting result for a breeding season study as juvenile birds in general are expected disperse from their natal grounds.

An anecdotal observation that we began documenting in 2015 was the presence of scattered pin feathers on adult body plumage. At least 21 of 158 adults, 8 males and 13 females were recorded with pin feathers >> expected accidental losses, on multiple tracks, and often in bilaterally symmetrical pattern. Generally, North American hummingbirds are thought to have a complete body molt in the winter, but a late summer molt has been proposed in the Ruby-throated Hummingbird.

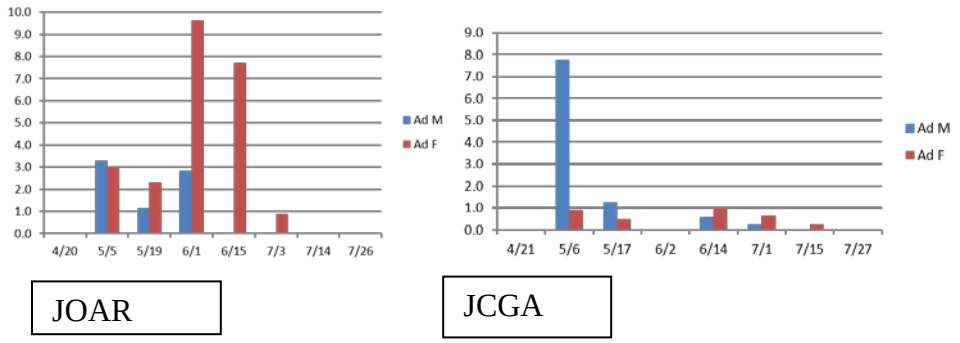
By banding at regular intervals, we documented a general outline of the season. Using the birds caught per trap hour as a relative index of abundance for adult abundance we can see that adult males peaked early in the season and were sparse by early July due to migration. Females peaked in May and June and continued to be captured in to July (Fig. 1).

The first young of the year were observed in late June, and we started capturing them in 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 is highly unlikely in this region. Banding is the best way to gain insight into the nesting phenology because rufous hummingbirds are highly difficult to locate in Alaska. Young birds are observed in small numbers locally in August, but become uncommon in late July, due to migration.

Morphometric data will be further examined and compared with hummingbird banding sites throughout the RUHU range.

Contact: Gwen Baluss, Juneau Ranger District, 8510 Mendenhall Loop Rd., Juneau AK 99801 Phone: (907) 789-6222 E-mail: gwenbaluss@gmail.com

Figure 1. 2015 captures of adults at Juneau Community Garden, and Jensen-Olson Arboretum as measured by birds per trap hour vs. date. Adult males (Ad M) are shown in blue, and adult females (Ad F) in red.



SITKA WINTER BIRD OBSERVATION PROJECT, 2015 SEASON (BCR 5)

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

From 2012 to 2015 we investigated wintering land bird species in Sitka, Alaska. We targeted 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. We hoped to learn more about 1) site fidelity of local over-wintering individuals, and 2) spatial patterns of local individuals throughout the year. Additional objectives were to 1) increase interest and knowledge of grade-school and high 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.

Annually, in November, we captured birds by mist net or ground trap and fitted individuals of target species with unique color band combinations. Other species captured were banded simply with standard metal bands. Sample size has been limited to less than 30 individuals for Song Sparrow and Chestnut-backed Chickadee, but returns have been recorded. Captures of juncos was more successful, with about 300 birds color-banded since the beginning of the study. Citizen scientists have been entering sightings of color banded birds. Findings have been entered into a spacial database for future analysis.

This project is primarily an educational endeavor, but may yield results of greater ornithological interest. Similar studies are underway in Washington State, but the results may be different in the north where juncos are potentially more migratory.

Local website for info and reporting observations http://sitkawild.org/2012/11/have-you-seen-this-bird/; http://wiki.seaknature.org/Form:SBBP_observation.

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2015 LANDBIRD UPDATE FROM THE TONGASS NATIONAL FOREST (BCR 5)

Bonnie Bennetsen, Cheryl Carrothers, Gwen Baluss, Susan Oehlers, Joe Delabrue, Ray Slayton, Jack Ruggirello, and Chris Leeseberg , US Forest Service, Alaska Region

Monitoring

Breeding Bird Survey Routes

USFS personnel continued to count routes at Yakutat (2 routes) and Stikine River, and coordinated as requested with volunteers, other agencies and NGO's to assist with completion for other routes within the Tongass: Chichagof Island (2 routes) and Sitka.

Alaska Landbird Monitoring Survey (ALMS)

This was the thirteenth year of successfully implementing the ALMS protocol. The USFS continues to be a dedicated participant in this statewide effort. Seven ALMS blocks were planned this year on the Tongass National Forest as a whole. Five of these were successfully accessed. Site localities included: Yakutat West Fork, Yakutat Ranger District (RD); Sitkoh Lake, Sitka RD, Mansfield Peninsula, Ford's Terror and Windfall Lake, Juneau RD. Record rainfall in Southeast Alaska, and land exchanges cancelled other odd-year count blocks.

Northern Goshawk Surveys

The Tongass NF continues to conduct surveys annually for occupancy by breeding Northern Goshawks in areas where uses such as timber sales, roads, mining or other activities are proposed within suitable forest habitat. Wildlife personnel catalog all surveys, both by FS or contractors, any anecdotal observations and checks of known nests in the agency database Natural Resource Information Systems (NRIS).

Education and Outreach:

CBC: A local Christmas Bird Count on Prince of Wales Island in 2015 was coordinated by Ray Slayton at Thorne Bay Ranger District.

International Migratory Bird Day: Juneau Ranger District offered songbird banding demonstration and kid's activities in partnership with Juneau Audubon Society and the Juneau Community Garden Association. At least 60 attendees were delighted to get a close-up look at temperate rain forest songbirds.

Yakutat Tern Festival: The fifth annual tern festival was held May 28-3, 2015. The USFS is one of multiple partners for the community event. Initiated in 2011, the mission of the festival is "to highlight the extraordinary natural and cultural resources of Yakutat and to stimulate the local economy by hosting a festival celebrating Aleutian Terns." Birdwatching, including landbirds, is an important aspect of the festival. Four days of bird-themed youth and adult activities included field trips, and Anchorage Bird TLC live bird presentations. Researcher and popular bird author John Marzluff delivered the keynote presentation on the social behavior and ecology of corvids.

Stikine River Birding Festival: 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. Activities included presentations on regional birding, banding migratory passerines, and bird field trips.

Alaska Hummingbird Festival: 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.

Mendenhall Glacier Visitor Center Interpreters received training on Southeast Alaska bird ID and conservation from JRD Wildlife Technician Gwen Baluss. They in turn were able to share their skills and enthusiasm for bird viewing with some of the 450,000 center visitors in 2015.

Hoonah Ranger District held four birding interpretive education programs in April and May with a 5th and 6th grade class including three indoor lessons and one field trip.

Sitka Ranger District assisted with annual community BioBlitz, which included a bird count.

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2015 LANDBIRD UPDATE FROM THE CHUGACH NATIONAL FOREST (BCR 5)

Jessica Ilse, Melissa Gabrielson, Erin Cooper, Mary Anne Benoit, and Matt Moran, U.S. Forest Service

Monitoring

BBS Routes -Seward Ranger District
Hope breeding bird survey route #216 was completed on the Kenai Peninsula
BBS Routes -Cordova Ranger District
Cordova has two 24.5 km routes, however, only one route is currently accessible due to the bridge closure at mile 37 of the Copper River Highway. Breeding Bird Survey route #050 was completed in June. The data collected from the survey was entered in the national database.

Alaska Landbird Monitoring Survey (ALMS) – Cordova Ranger District

This was the 11th year of implementing this point count protocol on the Chugach National Forest. Two ALMS blocks were surveyed in 2015 on the Cordova Ranger District. Locations included Kayak Island and Bettles Bay Blocks. All grids were successfully accessed and surveyed. One full-time technician, one biologist from the SO, and three biologists from the Cordova Ranger District contributed. All GPS points are stored in a database to assist with re-locating points in future years. Point count data was compiled, entered into a database and sent to the USGS Alaska Science Center for further data management and analysis.

Education and Outreach

International Migratory Bird Day: Personnel staffed a booth to teach Binoculars 101 and how to identify birds by sounds at Potter's Marsh during Potter's Marsh Discovery Days. The presentations introduced youth to the basics of birding and using binoculars. Approximately 1,200 people attended, the vast majority was urban youth.

Easter Birding: Staff taught youth and adults about springtime migration, and how to identify migratory and resident birds by sight and sound. The presentation helped to educate forest users about the importance of our forest habitats to a wide variety of migratory birds and to increase their knowledge and enjoyment of birds so they will support migratory bird conservation. Approximately 100 people attended, of which about 70 were elementary school children. The program was conducted in partnership with the Alaska Wildlife Conservation Center at their new boardwalk.

Copper River Delta Shorebird Festival: The 25th annual shorebird festival was held on May 7-10, 2015. The Copper River Delta Shorebird Festival is a collaborative event with partners from the Cordova Chamber of Commerce and the US Forest Service Cordova Ranger District. The Festival focuses on educating the public about birds, bird conservation, and bird life cycles and strategies through a variety of activities, classes, crafts, and workshops. This year's festival featured the Wetland Ballet; a seasonal progression of the Copper River Delta featuring wild salmon, wildlife flowers, waterfowl, mammals, and migrating birds. "Maya" the Western

Sandpiper made her debut appearance to educate the public about the interconnectivity of shorebirds and their international ties.

Village Outreach and Community Owl Surveys: Local schools in the villages of Tatitlek and Chenega were visited by US Forest Service personnel in the spring of 2015. Presentations and activities were provided to educate the communities about the Forest Service and the landscape that we manage. Owl ornaments were made by local students for the Capital Christmas tree and community owl surveys were conducted.

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ALASKA STATEWIDE PROJECTS AND SUMMARIES

ROAD-SYSTEM GROUSE AND PTARMIGAN ABUNDANCE SURVEYS, ALASKA, 2015 UPDATE

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. In Alaska, 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, very close to large urban centers, and those that 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 with listening posts approximately every 0.5 mile 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, and in Tok in 2014. The average number of males per lek is used as an index of abundance. Sooty Grouse surveys were established in spring 2015 near the communities of Juneau and Petersburg and springtime index the number displaying males. A broadcasted recording is used for assessing the breeding population of male Willow and Rock Ptarmigan along established transects. Survey routes have been established along the Denali, Richardson, Parks, Taylor, and Steese highways as well as locations away from road access to begin monitoring less heavily exploited populations. In 2014, additional survey routes were established along the southern Kenai Peninsula and will be continued annually.

Based on surveys in spring 2015, monitored populations are generally abundant and widespread. Interior Ruffed Grouse populations are increasing in abundance after recording the low in 2010-11. Sharp-tailed Grouse populations near Delta Junction and Tok appear to be highly abundant. Sooty Grouse densities are also quite high near Juneau and Petersburg although it is difficult to know how this relates to historical densities with only one year of data. Monitored Willow and Rock Ptarmigan populations through the summer and early fall of 2015 are also generally at higher abundance than the long-term average.

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Literature Cited:

Merizon, R.A. and C.J. Carroll. 2015. Alaska small game summary 2015. 5pp. Unpublished report. http://www.adfg.alaska.gov/index.cfm?adfg=smallgamehunting.research

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STATEWIDE HUNTER HARVESTED GROUSE AND PTARMIGAN WING COLLECTION PROGRAM, ALASKA, 2015 UPDATE

Alaska Department of Fish and Game

Since 2011, the statewide Small Game Program within the Alaska Department of Fish and Game (ADF&G) has been collecting grouse and ptarmigan wings and tails from hunter harvested birds. This is a voluntary program that through 4 hunting seasons (2011/12 - 2014/15) has received samples from over 215 hunters statewide. During the 2014 regulatory year (RY; July 1, 2014 to June 30, 2015) hunters provided wings from 74 Ruffed, 322 Spruce, 103 Sharp-tailed, and 43 Sooty Grouse in addition to 289 Willow, 51 Rock, and 56 White-tailed Ptarmigan wings statewide (R. Merizon pers. communication). Samples were collected from 18 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 harvest demographics, distribution and timing and harvest and hunter effort, and juvenile production.

This program will continue and is a permanent portion of the ADF&G Small Game Program. The program provides free wing envelopes and free return options to encourage participation. Envelopes are available either through direct mailing or at all ADF&G offices. From August through October 2015 hunters have provided nearly 600 samples statewide.

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NORTH AMERICAN BREEDING BIRD SURVEY, ALASKA 2014 UPDATE

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. The BBS website (https://www.pwrc.usgs.gov/bbs) currently has information available on numbers of routes run up to 2014 (Fig. 1). Through the dedication of many observers, the program has now run 86 routes for ≥10 years and 40 routes for ≥20 years. Four routes have been run for 30 years or more: Anchor River, Galena (30 years), Little Salcha (31 years), and Swan Lake Road (33 consecutive years!). In 2014, BBS surveys were conducted on 61 routes, the fewest in Alaska since 1992 (38 routes) and well below the state-wide average of 72 routes per year since 1993 (Fig. 1). A big priority will be filling route vacancies (http://www.pwrc.usgs.gov/bbs/results/routemaps/index.cfm) with the goal of running a minimum of 70 routes in 2016.

The long-term effort in Alaska provides 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 1966–2013 for Canada (Sauer et al. 2014, Environment Canada 2014). Alaska trends are currently not available on the website; however, John Sauer and his colleagues with the BBS are updating these trend estimates which are currently in review. Furthermore, Colleen Handel is currently working with John Sauer to jointly estimate trends using the combination of data from the BBS and the Alaska Landbird Monitoring Surveys, which will potentially greatly increase the power to detect trends of Alaska birds.

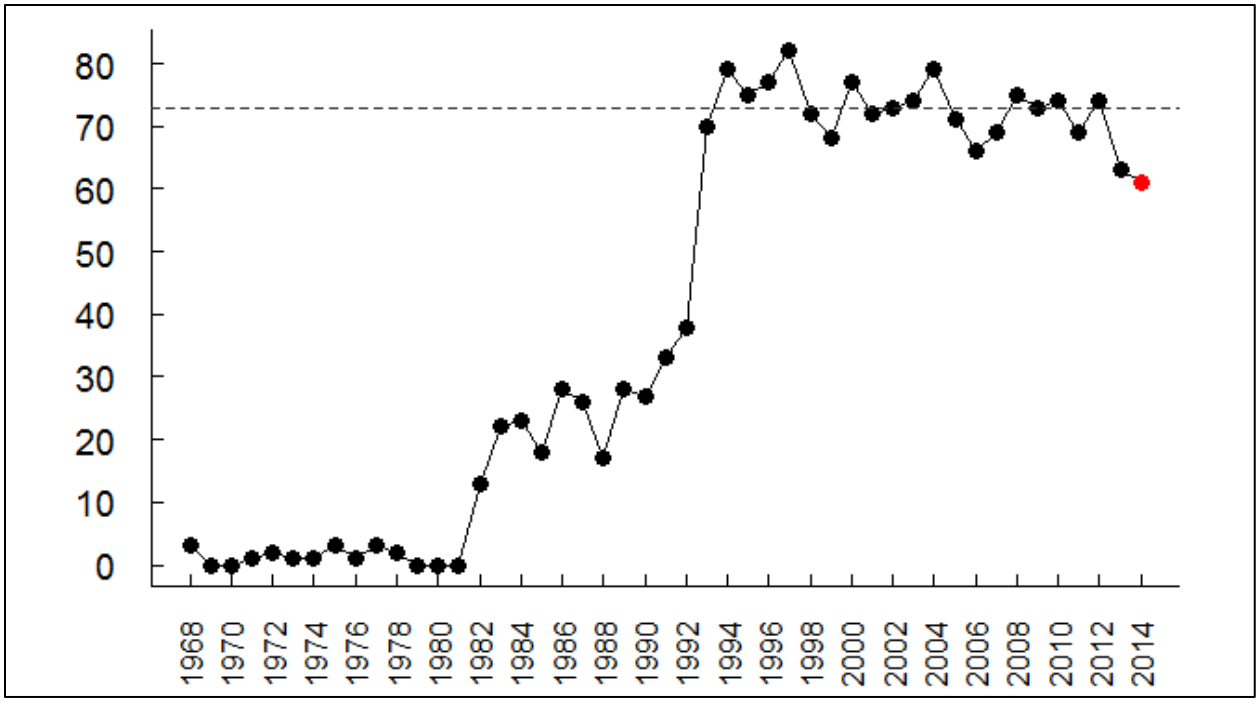

Fig. 1. Annual number of routes (y-axis) surveyed in Alaska as part of the BBS, 1968–2014. Reference line is the mean number of routes surveyed 1992–2014 (72 routes).

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Literature Cited:

Environment Canada, 2014. North American Breeding Bird Survey - Canadian Trends Website, Data-version 2012. Environment Canada, Gatineau, Quebec.

Sauer, J. R., J. E. Hines, J. E. Fallon, K. L. Pardieck, D. J. Ziolkowski, Jr., and W. A. Link. 2014. The North American Breeding Bird Survey, Results and Analysis 1966–2012, Version 07.03.2014. USGS Patuxent Wildlife Research Center, Laurel, Maryland. [online] Available at http://www.mbr-pwrc.usgs.gov/bbs.

Sauer, J. R., and W. A. Link. 2011. Analysis of the North American Breeding Bird Survey using hierarchical models. Auk 128:87–98.

BEAK DEFORMITIES IN ALASKA

Colleen M. Handel, Caroline Van Hemert, Lisa M. Pajot, and Rachel Richardson, USGS Alaska Science Center

An epidemic of beak deformities in Black-capped Chickadees (*Poecile atricapillus*), Northwestern Crows (*Corvus caurinus*), and other primarily resident species has been documented in Alaska over the past decade. Our recent research on what we have termed 'avian keratin disorder' has focused on (1) determining the cause of this abnormal condition, (2) monitoring the temporal and spatial occurrence of this disorder, and (3) determining the population-level consequences of beak deformities in terms of reproduction and survival. A long-term mark-recapture study is ongoing to monitor prevalence of the disorder in chickadees in south-central Alaska and to quantify effects on survival. We recently completed an assessment of environmental contaminants and found no evidence that selenium or any other inorganic element was responsible for beak deformities in chickadees, although we did detect elevated levels of chromosomal damage in affected birds that was suggestive of toxic exposure to organochlorine compounds (Handel and Van Hemert, 2015). Analysis of inorganic elements in Northwestern Crows also did not indicate that metals or other trace elements are responsible for beak deformities in this species (Van Hemert and Handel, in review). In collaboration with scientists at the California Academy of Sciences and San Francisco State University, we are using next-generation-deep-sequencing techniques to screen for viruses among affected birds (Hanna et al., 2015; Zylberberg et al., in prep.). We are also analyzing behavioral data collected with video cameras at nest boxes to quantify how such a physical handicap influences reproductive fitness in affected chickadees.

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BLOOD PARASITES IN LANDBIRD HOSTS IN ALASKA

Caroline Van Hemert, Colleen Handel, Lisa Pajot, Matt Smith, Rachel Richardson, USGS Alaska Science Center; Rick Merizon, Alaska Department of Fish and Game

Prevalence and distribution of parasites in avian hosts are influenced by a variety of factors, including local environmental and climatic conditions. Vector-borne pathogens are especially responsive to temperature fluctuations and therefore provide useful models for the study of climate–pathogen interactions. The prevalence and distribution of avian blood parasites, for which blackflies, biting midges, and mosquitoes serve as vectors, are projected to expand in response to warmer temperatures and vegetation changes in Arctic and subarctic regions. However, limited information is available for Alaskan landbirds and nothing is currently known about vectors of blood parasites in Alaska. We are conducting several studies on the prevalence, distribution, diversity, and fitness effects of blood parasites in avian hosts:

1) Passerines, Seward Peninsula: The Seward Peninsula occupies a key transitional zone between Arctic and boreal environments and is undergoing rapid ecological change associated with climate warming. Since 2012, we have captured passerines at three sites on the Seward Peninsula for analysis of blood parasite infections. In 2015, we collected blood samples from 350 individuals of 22 species, bringing our total number of avian samples to 1100. We also collected samples of mosquitoes, midges, and biting flies to

evaluate the effects of habitat on vector abundance. Lab work is ongoing and future analyses will address relationships between habitat, host factors, and rates of infection.

2) Grouse and ptarmigan, statewide: Grouse and ptarmigan are widely distributed across Alaska. Little is known about the prevalence and diversity of blood parasites in this group of birds, particularly in northern regions. In collaboration with the Alaska Department of Fish and Game, we have analyzed muscle samples from hunter-shot specimens for blood parasites from around the state. Preliminary results indicate that prevalence and genetic diversity of parasites vary by region, species, and age.
3) Northwestern Crows, coastal Alaska: In combination with ongoing research on beak deformities in Alaskan birds, we are studying blood parasite infections and population genetics of Northwestern Crows. Preliminary results indicate geographic differences in population structuring and rates of parasite infection, with an apparent division between southeastern and southcoastal Alaska.
4) Black-capped Chickadees, southcentral Alaska: Black-capped Chickadees with avian keratin disorder exhibit reduced fitness and may be less resistant to other pathogens and parasites. We are currently investigating individual immune response and seasonal patterns of blood parasite infection using microscopy and quantitative PCR from samples collected 2013-2015.

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APPENDIX 1. SELECTED RECENT BPIF MEMBER PUBLICATIONS

Barker, N. K. S., P. C. Fontaine, S. G. Cumming, D. Stralberg, A. Westwood, E. M. Bayne, P. Solymos, F. K. A. Schmiegelow, S. J. Song, and D. J. Rugg. Ecological monitoring through harmonizing existing data: lessons from the Boreal Avian Modelling Project. Wildlife Society Bulletin 39:480–487.

Domenech, R., T. Pitz, K. Gray, and M. Smith. 2015. Estimating Natal Origins of Migratory Juvenile Golden Eagles Using Stable Hydrogen Isotopes. Journal of Raptor Research 49:308-315.

Handel, C. M. and C. R. Van Hemert. 2015. Environmental contaminants and chromosomal damage associated with beak deformities in a resident North American passerine. Environmental Toxicology and Chemistry 34:314-327. doi:10.1002/etc.279

Hanna, Z.R., C. Runckel, J. Fuchs, J.L. DeRisi, D.P. Mindell, C. Van Hemert, C.M. Handel, J.P. Dumbacher. 2015. Isolation of a Complete Circular Virus Genome from an Alaskan Black-capped Chickadee (*Poecile atricapillus*). Genome Announcements, In Press.

Mahon, C. L., E. M. Bayne, P. Sólymos, S. M. Matsuoka, M. Carlson, E. Dzus, F. K. A. Schmiegelow, and S. J. Song. 2014. Does expected future landscape condition support

proposed population objectives for boreal birds? Forest Ecology and Management 312:28–39.

Matsuoka, S. M., C. L. Mahon, C. M. Handel, P. Sólymos, E. M. Bayne, P. C. Fontaine, and C. J. Ralph. 2014. Reviving common standards in point-count surveys for broad inference across studies. Condor: Ornithological Applications 116:599–608.

Marcot, B.G., M.T. Jorgenson, J.P. Lawler, C.M. Handel, and A.R. DeGange. 2015. Projected changes in wildlife habitats in Arctic natural areas of northwest Alaska. Climatic Change 130: 145-154.

McNew, L. B. and C. M. Handel. 2015. Evaluating species richness: biased ecological inference results from spatial heterogeneity in species detection probabilities. Ecological Applications In Press.

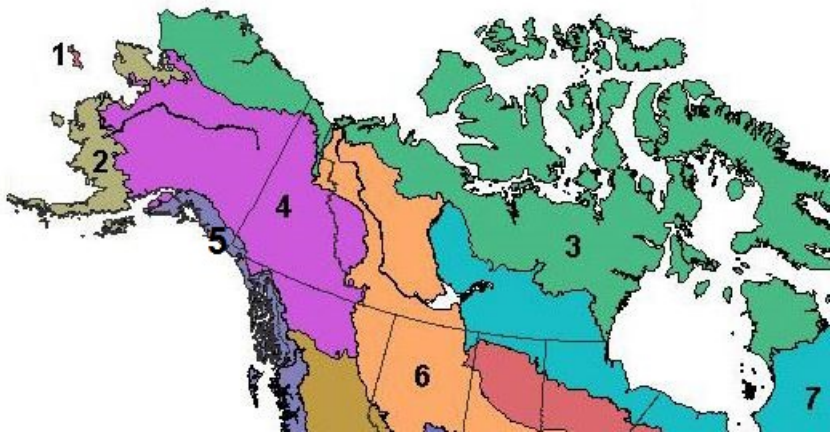
Stralberg, D., E. M. Bayne, S. G. Cumming, P. Sólymos, S. J. Song, and F. K. A. Schmiegelow. 2015. Conservation of future boreal forest bird communities considering lags in vegetation response to climate change: a modified refugia approach. Diversity and Distributions 21:1112–1128.

Stralberg, D., S. M. Matsuoka, A. Hamann, E. M. Bayne, P. Sólymos, F. K. A. Schmiegelow, X. Wang, S. G. Cumming, and S. J. Song. 2015. Projecting boreal bird responses to climate change: the signal exceeds the noise. Ecological Applications 25:52–69.

Van Hemert, C., P. L. Flint, M. Udevitz, J. Koch, T. Atwood, K. Oakley, and J. M. Pearce. Forecasting wildlife response to rapid warming in the Alaskan arctic. BioScience, In Press.

Van Hemert, C.R., J.M. Pearce, and C.M. Handel. 2014. Wildlife health in a rapidly changing north: Focus on avian disease. Frontiers in Ecology and the Environment 12(10):548-556. doi:10.1890/130291

APPENDIX 2. MAP OF BOREAL BIRD CONSERVATION REGIONS



1.Aleutian/Bering Sea Islands 2.Western Alaska 3.Arctic Plains and Mountains 4.Northwestern Interior Forest 5.Northern Pacific Rainforest 6.Boreal Taiga Plains 7.Taiga Shield and Hudson Plain

Bird Conservation Regions of Northern Canada and Alaska as established by the U.S. North American Bird Conservation Initiative (NABCI) Committee. BPIF generally concentrates on BCR's 1-5. For more information see http://nabci-us.org/committee/

RECOMMENDED CITATION FORMAT

Author(s). 2015. Project title(s). 2015 summary of landbird projects for boreal partners in flight. Boreal Partners in Flight, Alaska, USA.