

# 2016 Summary of Landbird Projects For Boreal Partners in Flight



*December 3, 2017*

Individual project reports were merged and lightly edited by the compiler, G. Baluss. For more information about each study, please contact the individual authors.

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 2016 Boreal Partners in Flight (BPIF) report, a listing of new, recently completed, and ongoing landbird projects in Alaska and Northwestern Canada. Reports are arranged by Bird Conservation Region (BCR). A map of BCR’s can be found in Appendix 2.

Thanks to each contributor and the tremendous effort the summaries represent.

BPIF has been bringing together government biologists, university and independent 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.

Climate is projected to change bird habitat in the North, and some of those effects may already be reflected in regional and broad scale monitoring efforts described in this report such as the Boreal Avian Modeling Project, Alaska Landbird Monitoring System, Breeding Bird Survey and ADF&G statewide game bird surveys. Additionally, studies in progress in localities such as the Seward Peninsula and Denali National Park will yield insight along the changing shrub/tundra transition zones.

Further, climate may affect birds’ resistance to disease. The role of pathogens in landbird populations is an arguably understudied topic. However, researchers at the USGS Alaska Science Center and their colleagues are investigating blood parasites, and a mysterious keratin disorder that has been causing bill deformities in Alaska. Now, a breakthrough on the keratin disorder front has revealed a novel virus which likely plays a central role in this process.

It is also an interesting time for studying long-distance bird migration, as the expanded use of geolocators on boreal birds are elucidating details of migratory pathways. 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.

**If you study landbirds occurring in Alaska or Northwestern Canada, please help make future reports more complete by submitting a brief summary, following the format in this report, to the current BPIF chairs.**

Finally, no report can cover the whole of on-going studies. The following sources may also be helpful.

Selected recent publications from BPIF members can be found in Appendix 1, and in the “Literature Cited” sections of various reports.

Recent BPIF meeting notes and annual reports can be accessed via this link:

[https://drive.google.com/drive/folders/0B3zAaptg-\\_rDQzRITGdZbmgxaWM?usp=sharing](https://drive.google.com/drive/folders/0B3zAaptg-_rDQzRITGdZbmgxaWM?usp=sharing)

Gwen Baluss, BPIF, BCR 5 Coordinator

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## PROJECT NARRATIVES, ARRANGED BY BIRD CONSERVATION REGION AND AUTHOR

(BCR 2) LANDBIRD MONITORING ON KODIAK ISLAND, 2016

Robin Corcoran<sup>1</sup>, Cindy Trussell<sup>2</sup>, and Rich MacIntosh<sup>3</sup>

<sup>1</sup>U.S. Fish and Wildlife Service, <sup>2</sup>Kodiak College, <sup>3</sup>Biological Consultant

*Breeding Bird Survey* – two road-system surveys (Kodiak II (231) and Chiniak (131)) were conducted in June 2016 by Cindy Trussell and Rich MacIntosh.

*Christmas Bird Count* – two counts were conducted, the Kodiak count circle (12/17/2016) and the Narrow Cape/Kalsin Bay count circle (12/31/2016). 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 2010-2016, we 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 seven years of mist net operation, we captured and banded 1641 birds representing 21 species, and recaptured between years 97 individuals representing 11 species (Table 1). The most commonly caught species were Fox Sparrow, Hermit Thrush, Pacific Wren, and Wilson’s and Yellow Warbler. 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. We had approximately 30 volunteers each season and nearly 100 participants across the seven years. A cumulative total of approximately 2100 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 2016.

Species	Year*								Total	No. Recaptured Between Years	Mean Hatch Year to Adult Ratio
	2010	2011	2012	2013	2014	2015	2016				
Fox Sparrow	46	44	33	48	58	80	80	389	23	1.6	
Hermit Thrush	52	41	47	30	43	42	41	296	22	2.2	
Wilson’s Warbler	76	26	29	16	29	42	19	237	17	0.3	
Pacific Wren	16	24	0	1	21	59	62	183	6	0.4	
Yellow Warbler	29	15	26	23	8	13	11	125	14	0.2	
Golden-crowned Kinglet	3	27	0	0	4	63	5	102		1.8	
Black-capped Chickadee	13	5	5	10	7	17	7	64	6	1.9	
Pine Siskin	1	12	3	12	0	30	2	60			
Varied Thrush	3	12	9	12	2	5	5	48	2	1.1	
Pine Grosbeak	1	5	4	10	2	4	2	28	3		
Orange-crowned Warbler	7	3	2	2	4	0	2	20			
Brown Creeper	0	0	1	4	2	12	0	19	2		
Red-breasted Nuthatch	2	2	2	7	1	5	0	19	1		
Common Redpoll	0	1	0	0	0	14	0	15			

Golden-crowned Sparrow	6	0	1	2	0	0	0	9		
Red Crossbill	0	0	0	0	1	7	0	8		
Downy Woodpecker	1	0	0	0	4	1	1	7		
Myrtle Warbler	1	0	2	2	0	0	0	5		
Song Sparrow	2	0	0	0	0	1	1	4		
Three-toed Woodpecker	0	0	0	1	0	0	1	2	1	
Northern Goshawk	0	0	0	0	0	0	1	1		
<b>TOTALS</b>	<b>259</b>	<b>217</b>	<b>164</b>	<b>180</b>	<b>186</b>	<b>395</b>	<b>240</b>	<b>1641</b>	<b>97</b>	
<i>Total Net Hours</i>	<i>371</i>	<i>341</i>	<i>358</i>	<i>357</i>	<i>347</i>	<i>355</i>	<i>361</i>			

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

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## (BCR 2) BIRD INVENTORIES ON YUKON DELTA NATIONAL WILDLIFE REFUGE

Kristine Sowl<sup>1</sup>, Stephen Brown<sup>2</sup>, Brad Winn<sup>2</sup>, Brad Andres<sup>3</sup>, Diane Granfors<sup>3</sup>, Jim Johnson<sup>3</sup>, Richard Lanctot<sup>3</sup>, Sarah Saalfeld<sup>3</sup>, Jim Lyons<sup>4</sup>, and Brian McCaffery<sup>1</sup>

Yukon Delta National Wildlife Refuge<sup>1</sup>, Manomet Center for Conservation Sciences<sup>2</sup>, U.S. Fish and Wildlife Service<sup>3</sup>, USGS<sup>4</sup>

Shorebird inventories were conducted on the Yukon Delta National Wildlife Refuge as part of the Program for Regional and International Shorebird Monitoring (PRISM). PRISM is a broad scale effort to estimate size, trend, and distribution of North American shorebird populations. In addition to conducting surveys for shorebirds, observers were asked to record the presence of any other species that were detected while the observer was on plot in order to provide information on species distributions. Information about avian species distribution on the refuge tends to be either patchy or poor, with most known about the distributions of waterfowl species.

Survey plots were selected throughout the Delta in a stratified random design with strata delineated by expected shorebird densities based on habitat. The survey area included most of the refuge, but several areas were excluded including Nunivak Island, the Andreafsky Wilderness, part of the eastern edge of the refuge (considered lower priority and not worth the extra logistical difficulties), and Native-owned lands. Surveys targeted tundra-breeding shorebirds, so we also excluded tall shrub and forested habitats as well as alpine areas (Nelson Island, Askinuk Mountains, and Kilbuck Mountains).

Survey plots were 16-ha in size. A single observer walked a plot for 1 hour and 36 minutes, mapping all shorebird observations and recording their behaviors. All non-shorebird species that were detected during these surveys were recorded as present. Observers were all experienced in shorebird identification, but some were better than others at identifying non-shorebird species. Surveys were conducted between 15 and 26 May in both 2015 and 2016.

A total of 621 rapid plots were surveyed during the two years of the project. A total of 42 species of landbirds were detected during these surveys with about half of these species detected

at <5 survey plots. The most frequently detected species were savannah sparrow (83% of plots), Lapland longspur (60%), willow ptarmigan (47%), American tree sparrow (37%), and common raven (32%). Redpolls (lumping common, hoary, and unidentified redpolls) were observed at 46% of the plots. The most frequently detected raptor was northern harrier seen at 9% of the plots. Rusty blackbirds, a species of conservation concern, were observed at 6% of the plots.

This project was a huge cooperative effort. Partners included Yukon Delta National Wildlife Refuge, USFWS Migratory Bird Management Program (National and Alaska Region), USFWS Refuge Inventory and Monitoring Program (National and Alaska Region), Manomet Center for Conservation Sciences, and USGS Patuxent Wildlife Research Center. Funding was provided by these organizations, as well as grants from the National Fish and Wildlife Foundation (matched with contributions from generous donations from private citizens to the Manomet Center for Conservation Sciences).

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#### (BCR 2 & 4) ALASKA SWALLOW MONITORING NETWORK

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#### *Overview*

The Alaska Swallow Monitoring Network is a multi-entity effort to collect ecological data on climate-change impacts to Tree Swallows using artificial nest box colonies throughout Alaska. Although the network is centered around ecological research, an integral component of the network integrates a citizen science-based approach at most sites, with data being collected, interpreted, and shared by students, teachers, researchers, and community members. Another benefit of this network approach, whereby all sites collect ecological data using the same field methods, is our ability to directly compare Tree Swallow breeding phenology, nest success, and banded bird return rates across sites across the state. The summer of 2016 was the first season of data collection using the full network approach: researchers and student trainees from four sites (Fairbanks, Anchorage, King Salmon, and McCarthy) underwent a day-long training partway through the field season, and sites shared data collection and analysis protocols.

#### *Monitoring*

Table 1. 2016 Summary of Tree Swallow Nesting Ecology in Artificial Nest boxes in the Alaska Swallow Monitoring Network

	<b>Fairbanks</b>	<b>Anchorage</b>	<b>Alaska Peninsula</b>
# Available Nest Boxes	154	139	82
# Active Boxes	68	64	61
Occupancy Rate <sup>1</sup>	0.44	0.46	0.74
Mean Julian Lay Date	145	143	149.9
Mean Julian Hatch date	163	155	168.1
Mean Julian Fledge Date	183	-	188.4
Total # Eggs Laid	403	355	374
# Eggs Hatched	357	-	307
# Adults Banded New	63	33	81
# Adults Returns <sup>2</sup>	57	20	33
# Nestlings Banded	347	244	295
# of Nests that Fledged <sup>3</sup>	61	60	54

<sup>1</sup>Occupancy rate: the # of boxes occupied/# of available nest boxes

<sup>2</sup>Birds banded in a previous year, returned in 2016

<sup>3</sup>Fledged: fledged at least one nestling

### *Education and outreach*

Network partners offered five internships; trained 24 volunteers who contributed 1,500 hours (including 17 youth/teens); and offered 23 public programs serving at least 1,451 people. Communities directly reached include: Fairbanks, Ester, Anchorage, McCarthy, Dillingham, King Salmon, Naknek, Kongiganak, Chignik, and Perryville. Many thousands more Alaskans were reached via informal presentations, signage on trails, homes, and nest boxes, social media, and at least 5 conventional media stories in newspapers, television, and radio (including Fairbanks Daily News Miner, Indian Country News, and KTVA channel 11 news).

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(BCR 2, 3, & 4) PAST, CURRENT, AND PROJECTED CHANGES IN TERRESTRIAL BIRD POPULATIONS RELATIVE TO CLIMATE SHIFTS ALONG THE BOREAL–ARCTIC TRANSITION ZONE

Colleen M. Handel, Steven M. Matsuoka, Courtney L. Amundson, Sarah J. Thompson, Rachel M. Richardson, Molly McDermott, 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. 2015, 2017). 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. From 2015–2017 we will collect and then integrate data on avian abundance, reproduction, growth, 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-mediated habitat change. 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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#### *Literature Cited*

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Stralberg, D., S. M. Matsuoka, C M. Handel, E. M. Bayne, F. K. A. Schmiegelow, and A. Hamman. 2017. Biogeography of boreal passerine range dynamics in western North America: past, present, and future. *Ecography* 39:in press.

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(BCR 3) RAPTOR SURVEYS AT LAKES IN THE OUMALIK-KOKULAK REGION, NPRA, ALASKA, JULY, 2016

Debbie Nigro, BLM, Fairbanks, and John Shook, ABR, Inc.

Although there are records of Peregrine Falcons nesting on lakes in North America, they have rarely been identified on lakes in Alaska. In 2016 we continued a survey for lake bluff nesting Peregrine Falcons that was conducted in 2012 and 2013. We surveyed ~325 lakes for nesting Peregrine Falcons in the foothills of northeastern NPR-A. 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 NPR-A and lakes within the National Hydrological Dataset to select lakes  $>0.25 \text{ km}^2$  that had an elevation range  $\geq 15 \text{ m}$  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  $>15 \text{ m}$  between the Topogarak River and the Kuk River in 2013 and 2016. During helicopter surveys in July 2016, we recorded Peregrine Falcons at 31 lakes, including 23 pairs of which 20 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. In summary, 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). During this same period in 2016 cliffs along the lower reaches of the Kogosukruk and Kikiakrorak rivers were surveyed resulting in identification of 11 cliffs containing pairs of Peregrine Falcons of which 9 were successful.

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#### (BCR 4) MONITORING TRENDS IN ABUNDANCE AND OCCUPANCY OF PASSERINE BIRDS IN THE NPS CENTRAL ALASKA MONITORING NETWORK

Carol McIntyre, Laura Phillips, and Emily Williams, Denali National Park and Preserve; Jeremy Mizel, NPS Arctic Monitoring Network; and Joshua Schmidt, NPS Central Alaska Monitoring Network

Passerine birds are a vital sign of the NPS Central Alaska Monitoring Network. In 2016, 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 2016, we surveyed the routes 3 to 10 times between 12 April and 29 June. The number of species detected on each route ranged from 36 to 49 species, with the most species detected on the McCarthy Road in Wrangell-St. Elias (n = 48 species) and route 2 along the Denali Park Road (n = 47 species). We detected 82 species across all routes. We detected singing Tennessee Warblers on both the McCarthy and Nabesna Roads in 2016, unlike in 2015, where we detected them only on the McCarthy Road. We also detected a singing Brown Creeper along the McCarthy Road on 14 June 2016. The last Brown Creepers detected were found along the McCarthy Road in 2012.

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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#### (BCR 4) CRITICAL CONNECTIONS PROGRAM FOR MIGRATORY BIRDS IN ALASKA'S NATIONAL PARKS

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

Alaska's National Parklands provide over 54 million acres of critical nesting habitat for an abundance and diversity of long-distance migratory birds that travel across boundaries and habitats throughout the year, including flights across continents and hemispheres. Nearly all the birds that nest in Alaska are international migrants that provide connections between our remote and wild Alaska parklands and the many visitors that travel here from around the world. The Critical Connections Program was initiated in 2014–2015 to provide essential information for conserving migratory species, by linking research results directly to conservation and education efforts. Our 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 population trajectories; and (3) expand collaborative efforts to mitigate constraining factors and protect critical resources required by Alaska's migratory birds. In 2015, we deployed light-level geolocators on 12 Gray-cheeked Thrush and 19 Swainson's Thrushes in Denali National Park and Preserve. In 2016, we recovered 12 geolocators from 5 Gray-cheeked Thrush and 7 Swainson's Thrush and deployed an additional 106 geolocators on Arctic Warblers, Fox Sparrows, Wilson's Warblers, Blackpoll Warblers, and Hermit Thrushes. Preliminary results indicate that Swainson's Thrushes may winter in central South America. In 2017, we plan to continue ongoing analyses of geocator data, as well as locate and recapture tagged individuals from 2015–2016.

More details about the Critical Connections Program can be found in Phillips, L. M., C. L. 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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#### (BCR 4) CLIMATE WARMING IMPACTS ON THE PERSISTENCE OF RESIDENT BIRDS IN ALASKA

Carol McIntyre, Laura Phillips, and Emily Williams, Denali National Park and Preserve; Ryan Norris, University of Guelph; and John Marzluff, University of Washington

Many resident birds that inhabit harsh climates at northern latitudes survive by caching perishable food items that they rely on throughout the winter, when food is scarce. With warming temperatures, resident birds are vulnerable to declines due to potential spoilage of winter food caches. The Gray Jay, a charismatic resident that stores food items in trees and lichens, is a common and conspicuous bird of the boreal forest. Growing evidence suggests that Gray Jays may be declining due to climate change-induced reduction in overall food availability, which reduces Gray Jay occupancy, productivity, and overwinter survival. In response to the NPS Climate Change Response Strategy and Denali National Park and Preserve's (Denali) Resource Stewardship Strategy, the Gray Jay Ecology project was initiated to fill critical gaps in knowledge about the year-round requirements of common resident birds of Alaska, and to understand how these species may respond to global climate change. At this stage, the primary program objectives are to: (1) develop a thorough understanding of the year-round requirements of Alaska's resident birds; (2) use data collected on the movements, foraging ecology, and productivity of Gray Jays to identify effects of warming temperatures on reproductive success and annual survival, and (3) engage the public by using volunteer citizen scientists to study Gray Jay behavior in accessible areas in and around park lands, both in Denali front-country areas and in neighborhoods of local residents. We began the Gray Jay Ecology project by identifying Gray Jay family groups and banding individuals of each group with unique color band combinations.

Starting in early 2017, we plan to map breeding territories and find and monitor the fates of nests.

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(BCR 4) WILLOW AND ROCK PTARMIGAN DISTRIBUTION AND MOVEMENT STUDIES IN  
SOUTHCENTRAL AND INTERIOR ALASKA, 2016 UPDATE

*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 study was initiated documenting movement, survival, and nesting success of Rock Ptarmigan within a historical study area (Weeden 1965) 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 were monitored monthly to determine movement patterns. Capture and collaring work was completed in August 2015 and monitoring ceased in June 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 important demographic rates, and movement patterns, 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, 33 in 2015, and 41 in 2016. Collared individuals have been monitored bi-monthly documenting movement and mortality of this population. Capture and collaring efforts were completed in September 2016 however aerial survey monitoring of movement and mortality will continue through May 2017. A final report should be available by December 2017.

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 a historical study area from the 1960s using methods described by Robert Weeden (Weeden 1965). In spring 2015 and 2016, a more

comprehensive approach was undertaken that included a survey to estimate breeding density of territorial male Rock Ptarmigan using distance sampling methodology (Buckland et al. 2001) as well as the capture and collaring of Rock Ptarmigan adult males and females each spring to study movements, survival, nesting success, and brood survival.

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

Tara Stehelin, Ph.D Candidate, University of Alberta @ Yukon College, Whitehorse, Yukon, Canada 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 species distribution models to enhance national models conducted by the Boreal Avian Modelling project (BAM) to examine impacts of habitat and climate variables, including disturbance 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 synchrony 5) investigate migratory patterns and connectivity in Olive-sided Flycatchers and Western Wood-Pewees breeding in Yukon.

This past year (2016) was the fourth field season in which breeding pairs were monitored for habitat characteristics at breeding sites, 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. Data on feeding behavior and prey preferences at nests was augmented in 2016 with data from game cameras with video capability. Novel nest site sanitation and feeding behaviors by Olive-sided Flycatcher females were captured on camera such as fecal sac removal and ‘mis-feeding’, or feeding a nestling several times before transferring an insect. Capture and deployment of light-

level geolocators (MigrateTech) was successful on two Olive-sided Flycatchers in sw Yukon in 2015. Neither of these two birds returned to territories in summer of 2016. Territories of local Olive-sided Flycatchers were large ( $9.9 \pm [SE] 1.3$  ha), at mid-high elevation ( $916 \pm 29$  m asl,  $n = 34$ ) and “open”, sometimes in Sub-alpine Fir dominated areas near treeline. Territories of Western Wood-Pewees were smaller ( $1.2 \pm 0.34$  ha), at lower elevation ( $679 \pm 24$  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 ( $n = 20$ ) (not yet calculated for 2016). 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 ( $\text{Abundance} \times \text{Weight} / \text{Length} \times \text{Day}^{-1}$ ) for Western Wood-Pewees but Olive-sided Flycatchers may have shown a disjunction in 2014, although not in 2015 or in 2016.

This project is ongoing and completion of objectives outlined here is scheduled for late 2017.

We acknowledge Boreal Avian Modelling project members, Yukon College, Yukon Research Centre, Canadian Circumpolar Institute and University of Alberta for financial support. Able field and lab assistance was provided by Jesse Vigliotti in 2015 and Kenji Tatsumi in 2016.

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#### (BCR 4) ZONES OF INTEREST FOR CONSERVATION OF BOREAL PASSERINE BIRDS

Diana Stralberg and Fiona Schmiegelow, University of Alberta (Boreal Avian Modelling Project)

The Canadian Wildlife Service (CWS) initiated a “Zones of Interest” project to identify priority areas for boreal landbird species, which represent a conservation planning gap in Canada. Under contract with CWS, we built on previous work by Carlson (2015), aiming to refine inputs and assumptions, and to identify conservation priorities across a range of scenarios. We developed 128 unique scenarios representing all possible combinations of the following six factors: (1)

*Prioritization algorithm*: focus on individual species core areas vs. species richness; (2) *Stratification*: boreal-wide vs. BCR subregion-specific conservation priorities; (3) *Disturbance*: discounted by footprint proportion vs. not discounted; (4) *Climate change and uncertainty*: discounted by current and/or future uncertainty vs. not discounted (four alternatives); (5) *Species weights*: species weighted by conservation status vs. all equal; (6) *Species list*: all priority landbird species vs. forest-associated boreal species.

For the boreal region of Canada (bird conservation regions 4, 6, 7, and 8), we used the Zonation (Moilanen 2007) conservation planning software to rank 4-km x 4-km grid cells according to their conservation value for 63 priority landbird species, resulting in a set of nested conservation “solutions” for a range of land percentage targets. Based on recommendations of the International Boreal Conservation Science Panel (Badiou et al. 2013), we used a 50% target as a starting point for evaluating scenario efficiency. As inputs to Zonation we used spatially explicit density and uncertainty predictions based on data from the Boreal Avian Modelling Project (Stralberg et al. 2015) to represent avian conservation value, and best available maps of human footprint (Hansen et al. 2013, Pasher et al. 2013) to represent existing levels of disturbance. Given the dispersed distributional characteristics of largely territorial boreal passerines, as well as the predominantly undisturbed quality of boreal habitats, we did not expect to identify distinct and universal conservation hotspots. However, after constraining our study area and focal species to be strictly boreal, we did find that solutions were similar across species weightings and uncertainty assumptions. Consistent high value areas were found in western British Columbia, northern Saskatchewan, central Newfoundland, and undisturbed portions of southern Saskatchewan, Manitoba, Ontario, and Québec. The largest differences in Zonation rankings were driven by external factors such as disturbance and climate change, as well as *a priori* choices regarding ranking algorithm and study area stratification. This highlights the importance of establishing *a priori* assumptions and criteria to guide the interpretation of results and identification of conservation priorities and management strategies.

In terms of efficiency, the species diversity-focused algorithm (“additive benefit function”) produced higher efficiency solutions than the species representation-focused algorithm (“core area zonation”), due to the inherent efficiencies of species substitutability. Furthermore, disturbance-and uncertainty-discounted scenarios were more efficient than their non-discounted counterparts, due to the coincidence of high uncertainty (and necessarily high disturbance) regions for multiple species. In contrast, stratification of conservation priorities by BCR subregion resulted in less efficient solutions, as expected given additional geographic constraints. Thus these scenarios do involve efficiency trade-offs.

Results from this study can cautiously be used to guide broad, continental-scale conservation priorities for boreal bird species. We suggest that more constrained scenarios, in terms of disturbance, climate change, and priority species, are generally more informative and appropriate than simpler, unconstrained scenarios, although we recognize the validity of a range of assumptions. Although no single map can be viewed as prescriptive, our core constrained scenarios suggest four alternative options for meeting complementary conservation goals efficiently (Figure 1). However, the opportunistic nature of conservation opportunities must also be considered, especially given the high replaceability that we found. Each conservation decision must address a full range of considerations and principles that are nearly impossible to include in

a single comprehensive analysis. Results of this report provide objective, data-driven insights to guide conservation planning activities and principles.

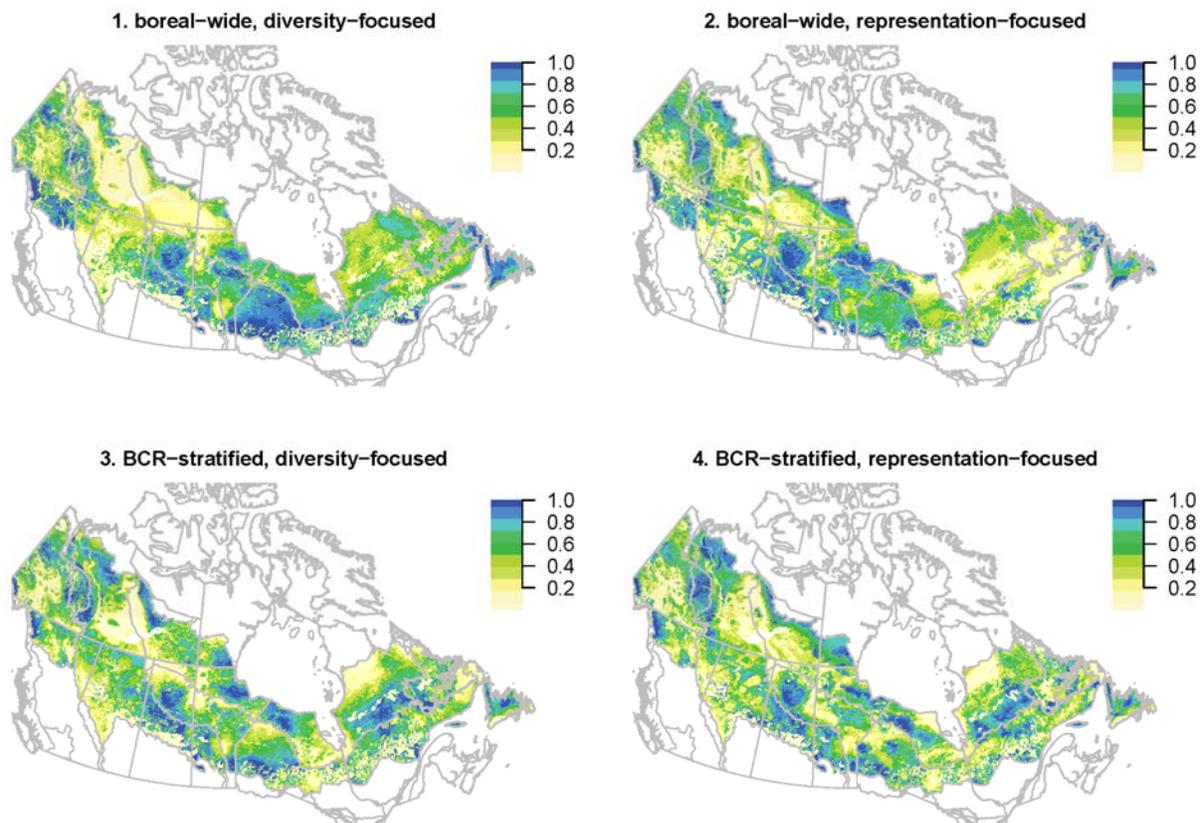


Figure 1. Conservation priorities based on four core scenarios, with areas of higher disturbance and model uncertainty down-weighted, and species' influence weighted by conservation status. BCR-stratified = BCR subregion-specific; species diversity focus based on additive benefit function; species representation focus based on core area zonation algorithm. Highest ranks are in dark blue; lowest ranks are in light yellow.

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#### (BCR 4 & 5) OLIVE-SIDED FLYCATCHER MIGRATION AND BREEDING BIOLOGY

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 2016, we had our first two-year geolocator recovery. This bird was released in 2014, but not detected in 2015 (a different male was breeding on its original territory). It was recovered the following year. A two-year return highlights the scientific and ethical responsibility of monitoring deployment sites for multiple seasons, in order to maximize recoveries. Data from this bird indicate that it completed two full migratory cycles to Alaska. However, spatial error inherent to geolocation makes it impossible to discern where, exactly, it returned during the intervening year. We made exhaustive searches at each site and neighboring territories in order to detect recoveries.

To date, 20 units have returned (3 of 8 [38%] deployed in 2013, and 8 of 27 [30%] deployed in 2014, and 9 of 38 [24%] deployed in 2015). In the 2016 season we also deployed a total of 19 new units in Anchorage and Fairbanks (Lotek Pinpoint GPS— a combination of 80point “Swiftfix” units and standard 10point units). All recovered birds in 2016 showed no noticeable loss of mass or fat, similar to previous years. For the first time, however, one bird exhibited signs of injury (skin irritation + feather loss) on its lower back, directly underneath the geolocator, possibly from rubbing. However, this bird also appeared to be molting head and scapular feathers at an unusual time (late June), which may have indicated other health

issues. Of the nine birds that returned with geolocator units, the injured individual and six others fledged young, whereas two experienced nest failure. One returning bird never paired.

We are continuing to analyze geolocator data in collaboration with Michael Hallworth at the Smithsonian Migratory Bird Center. Units collected to date have provided data on 13 individuals (12 male, 1 female) representing 16 round-trip journeys. Three birds have two consecutive years of data. Only five of the 13 birds (38%) crossed the Gulf of Mexico in fall, whereas eight traveled south along the eastern coast of Mexico. The east coast of Mexico is also a key northward route for OSFL in spring, as documented in our previous report. Two key wintering areas for Alaskan populations identified in our previous report remain the same: (1) Ecuador/northern Peru, and (2) southern Peru/western Brazil. We are in the process of identifying important stop-over areas along the annual route. The goal is to rank stop-over sites with regard to conservation need, by determining which sites currently have the least protection.

*Nest chronology:* Table 1 summarizes nest data for 2013-2016 seasons by location. Egg-laying in Anchorage preceded Fairbanks each year except in 2015, which was an exceptionally warm, early spring in the Interior (Table 1). Mean fledging dates, however, show significant overlap in both regions (Table 1). All nest chronology dates in Fairbanks fell within previously-reported date ranges for central Alaska (Wright 1997), including the earliest fledging nest (17 June 2016).

*Nest success by location:* Anchorage and Interior locations also showed no marked differences in nest success. Over the past four seasons, 21 of 25 nests (84%) fledged at least one nestling in Fairbanks, compared to 14 of 19 nests (74%) in Anchorage (Table 1).

*Historical site surveys and insect data:* Last season we completed three consecutive years of surveys at nine “historical” breeding sites in the Fairbanks area, previously studied by Wright (1997). Surveys covered a listening area of ~987 hectares per site and maintained a high detection probability (> 90%) at each of five survey points per site, given detection distances and singing rates from Wright (1997). In spring 2015 and fall 2016, single singing individuals were detected within 1km of two different historical sites. It is unlikely that either bird had bred at these locations, as singing only lasted a few days and fell outside the breeding season. Birds appeared to be passing through as part of spring or fall migration.

University of Alaska, Fairbanks Insect Collection (D. Sikes) is finalizing insect samples for three years of collections. Preliminary results regarding insect diversity indicate that historical sites (all of which were no longer occupied by OSFL) exhibited lower insect diversity (Shannon Index, calculated at the taxonomic Order level) than sites where birds were actively breeding. Work is ongoing, and patterns should be interpreted cautiously, as there appears to be substantial regional and inter-annual variation.

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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, n=6 nests in 2016) and Fairbanks (n=4 nests in 2013, n=5 nests in 2014, n=9 nests in 2015, n=7 nests in 2016).

	Mean Date (range)				Location
	2013 (n=8 nests)	2014 (n=9 nests)	2015 (n=14 nests)	2016 (n= 13 nests)	
First egg laid	3 June (28 May–14 June*)	5 June (28 May*–8 June)	6 June (29 May*–13 June*)	4 June (23 May*–20 June*)	Anchorage
	13 June (5*–18June)	12 June (01*–21* June)	3 June (25 May*– 12 June*)	10 June (27 May*–30 June*)	Fairbanks
Clutch size	4.3 eggs (4–5)	4 eggs	4 eggs (3–5)	4 eggs (3-4)*	Anchorage
	3 eggs (2–4)	3.4 eggs (3–4)	3.6 eggs* (3-4)	4 eggs*	Fairbanks
Hatching	22 June (16 June–3 July)	17 June (12–17 June)	23 June (13 June*–1 July)	19 June (8 June*–6 July*)	Anchorage
	30 June (22 June*–4 July*)	29 June (20June*–6 July*)	20 June (12 June*– 30 June*)	17 June (13 June*–21 June*)	Fairbanks
Fledging	12 July (6–21 July)	5 July (1–5 July)	12 July (3 July–21 July*)	10 July (27 June–25 July)	Anchorage
	20 July (12 July*–24 July)	17 July (9*–25* July)	10 July (29 June –21 July*)	5 July (16 June*–18* 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.

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(BCR 5) TONGASS HUMMINGBIRD PROJECT, 2016 UPDATE

Gwen Baluss, Juneau Audubon Society

The Rufous Hummingbird (*Selasphorus rufus*, 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 BCR 5.

In 2016, I repeated effort from 2013-2015 banding hummingbirds, with protocols developed by Rocky Point Bird Observatory (<http://www.rpbo.org/hummingbirds.php>) and the Hummingbird Monitoring Network (<http://hummonnet.org>). I banded at 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. Captures were generally on consecutive or within two days apart to allow comparison between the two sites.

From 2013 through 2016, 473 RUHU were banded at the two stations: 156 after-hatch-year (AHY) males, 228 AHY females, 33 hatch-year (HY) females, and 56 HY males.

2016 captures yielded a sizeable decrease of adults and young birds compared to previous years, with only slightly less effort. Annual variation will be discussed further in the 2017 report. The daily probability of capturing birds at a feeder is likely a function of not only the actual number of birds in the area but the availability of natural food. Thus, changes in phenology could affect capture rates. The spring of 2016 was unusually warm with traditionally cultivated plants recorded blooming about a month earlier than normal at the arboretum, and an apparent exodus of hummingbirds late in the summer reported by the managers. This is only a single year of data, and may or may not reflect a local or regional change in populations, but does reflect the high degree of variability in attempting to encounter hummingbirds for any type of survey.

Percentage returns of adults from previous years to be recaptured at the same location in another year, to date, is 9.9% for JCGA and 10.6% for JOAR. Additionally, one male and two females banded as juveniles have returned as adults.

Anna's Hummingbirds are uncommon in Alaska, but, according to bird-watcher's observations increasing in the last 5 years with more records year-round. Starting in fall of 2015, I banded Anna's Hummingbirds (*Calypte anna*) opportunistically at feeders in Juneau and Sitka. The purpose of the captures is to 1) enlist citizen scientists to re-sight banded birds so that winter persistence of individuals can be determined and 2) record age, sex and molt stages to gain perspective on the likelihood that this species has begun to breed in Alaska. To date, 14 Anna's Hummingbirds have been banded (5 AHY males, 5 HY males, 1 AHY female and 3 HY females). Several individuals have been re-sighted.

Initial support for the establishment of Rufous Hummingbird banding stations was provided by the US Forest Service, Region 10, Alaska. This is now a volunteer-run project. Additional support has been provided by the Juneau Community Garden Association, and the City and Borough of Juneau.

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#### (BCR 5) SITKA WINTER BIRD OBSERVATION PROJECT, 2016 SEASON UPDATE

Gwen Baluss, Juneau Audubon Society; Matt Goff, [sitkanature.org](http://sitkanature.org); Kitty LaBounty, University of Alaska Southeast; Scott Harris, University of Oregon

Southeast Alaska hosts migratory birds both as a summer breeding ground, and a winter destination. Few studies focus on winter birds.

From 2012 to 2016 we investigated wintering land bird species in Sitka, Alaska. We targeted for banding Dark-eyed (Oregon) Junco, Song Sparrow, and Chestnut-backed Chickadee. 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. Dark-eyed Juncos (301) were banded at nine locations over four years. Chestnut-backed Chickadees (29) and Song Sparrows (18) were banded in much smaller numbers. Other species captured were banded simply with USGS numbered metal bands. Citizen scientists enter sightings of color banded birds. Findings are entered into a spacial database for further analysis.

- Oregon Juncos (ORJU) capture rates in Sika a highly skewed towards hatch-year birds, and males. This result suggests habitat partitioning by age and sex may be occurring on the Pacific coast similar to that recorded in studies of Slate-colored Juncos on the Atlantic coast.
- About 3% of juncos captured were Slate-colored Junco (SCJU) or mixed types (either direct crosses of interior and coastal types, or the “cismontane” population from the Canadian Rockies). The nearest breeding zone for SCJU is about 200 miles from Sitka.
- Many ORJU were insular in their mid-winter movements. Of over 600 reports, ORJU were rarely seen outside of the neighborhood in which they were banded, even across years. The maximum distance was 2.3 km away.
- Some individual ORJU have returned to Sitka to be re-sighted or recaptured in subsequent winters suggesting some winter site fidelity, despite the suggestion of the above result that the majority of older males and females may be wintering in other areas.
- Three ORJU were re-sighted during the breeding season (approx. Apr. 15-Aug. 15), each within .5km of the site it was banded

- Song Sparrows in Sitka appear to be a mix of resident and migrant subspecies, as suggested by measurements as well as re-sighting patterns of some individual birds. However, sample size is small.
- Chestnut-backed Chickadees, as expected, have been entirely resident and encounters have been relatively close to banding sites. As in SOSP, sample size is small.
- Some unexpected captures of “bycatch” to the target species included a White-throated Sparrow, and Puget Sound subspecies White-crowned Sparrow.
- Hundreds of students have received bird-themed lessons with the excitement of a bird in hand, and the community continues to report banded birds.

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

To report encounters of color-banded birds in Sitka, see:  
[http://wiki.seaknature.org/Form:SBBP\\_observation](http://wiki.seaknature.org/Form:SBBP_observation)

In other communities, please contact the author if you have seen a color-banded bird of the above species.

Any banded bird can be reported to the USGS Bird Banding Laboratory:  
<https://www.pwrc.usgs.gov/bbl/>

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#### (BCR 5) JUNEAU TREE SWALLOW NEST WATCH

Brenda Wright and Gwen Baluss, Juneau Audubon Society

In 2015 and 2016 Juneau Audubon Society and local volunteers constructed Tree Swallow nest boxes (using a pattern developed the Golondrinas project <http://golondrinas.cornell.edu/>) and placed them in wetlands near Juneau, Alaska. They were monitored for occupancy by citizen scientists. Observers were encouraged to use the Cornell Nestwatch (<http://nestwatch.org/>) protocol when checking nest boxes, and to visit at least bi-weekly.

In 2016, there were 15 successful nests in the 40 nest boxes erected. There were 4 unhatched eggs, 2 dead fledglings, 1 dead adult, and 3 partial nests. A bear knocked down 2 nest boxes at Pioneer marsh and chewed the tops off to reach the nestlings.

The first tree swallows were observed on April 18. The first eggs were observed May 2. Active feeding at nest boxes occurred June 2-25. Boxes were removed in August for the winter.

The goals for continuing the project in 2017 include: having about 50 boxes up before April 1, recruiting more citizen scientists, continuing to record phenology, and finding optimal locations for occupancy. Construction designs will need to be modified in areas frequented by bears. Eventually, we hope for a good sample size of regularly occupied boxes for use in further studies.

This project was started with support from Audubon Alaska for swallow box building materials.

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#### (BCR 5) 2016 LANDBIRD UPDATE FROM THE TONGASS NATIONAL FOREST

Bonnie Bennetsen, Cheryl Carrothers, Gwen Baluss, Susan Oehlers, Joe Delabruce, Chris Leeseberg, Toby Bakos, and Robin Hasselquist, US Forest Service, Alaska Region

#### *Inventory & Monitoring*

*Breeding Bird Survey Routes* USFS personnel continued to count routes at Yakutat (2 routes), 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 fourteenth year of implementing the ALMS protocol. Four long-term monitoring sites were counted on Prince of Wales Island, Mitkof Island, Zarembo Island, and a mainland alpine site near Juneau.

*Tongass Landbirds and Thinning (TLAT) Study* TNF launched this project in 2016. Using a modified version of the ALMS protocol, with the addition of timber and deer habitat measures, 4 stands were surveyed for the purpose of assessing 50+ year old young growth habitat and comparing treatments of pre-commercial timber thinning vs. no thinning. Two grids were on Vank Island and two Mitkof Island.

*Northern Goshawk Surveys* The TNF continues to conduct surveys annually for occupancy by breeding goshawks in areas where uses such as timber sales, roads, mining, hydroelectric, recreational trails, 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's spacial database Natural Resource Information Systems (NRIS).

#### *Environmental Education and Citizen Science*

*Christmas Bird Count* Wrangell, Petersburg (WRD & PRD) personnel continue to help coordinate the local CBC efforts in their communities. 2016 will be the first CBC in Hoonah.

Hoonah Ranger District (HRD) provided training and equipment loans to local counters to help kick start the event.

*International Migratory Bird Day* Juneau Ranger District (JRD) offered songbird banding demonstration and kid's activities in partnership with Juneau Audubon Society and the Juneau Community Garden Association.

*Festivals* The sixth annual Yakutat Tern Festival was held in June. The USFS is one of multiple partners for the community event designed to highlight the extraordinary natural and cultural resources of Yakutat and to stimulate the local economy. Birdwatching, including landbirds, is an important aspect of the festival. Four days of bird-themed youth and adult activities included field trips, and presentations by bird researchers.

WRD is a key partner in the Stikine River Birding Festival annually. The SRBF celebrates spring migration, and the local and international importance of the Stikine River Delta to people and wildlife. Activities include talks by landbird researchers and bird field trips.

Ketchikan celebrates the Alaska Hummingbird Festival. The USFS Southeast Alaska Discovery Center help 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.

*Other Educational Efforts* Sitka Ranger District assisted with annual community BioBlitz, which included an extensive bird count. JRD technicians provided bird-watching presentations to about 100 fourth grade students for local elementary school BioBlitz. Mendenhall Glacier Visitor Center Interpreters received training on Southeast Alaska bird ID and conservation. They in turn were able to share their skills and enthusiasm for bird viewing with some of the 450,000 center visitors in 2016. HRD provided a local bird-watching class in partnership with a local professional bird guide. PRD, WRD and HRD personnel conducted multiple bird-themed elementary school presentations in their respective communities.

*Partnerships* TNF and Alaska region USFS continue to participate in the Western Hummingbird Partnership. And hosted an intern from the Environment for the Americas (EFTA) who assisted with various bird projects in the ALMS and TLAT studies.

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(BCR 5) 2016 LANDBIRD UPDATE FROM THE CHUGACH NATIONAL FOREST

Jessica Ilse, Melissa Gabrielson, Erin Cooper, and Mary Anne Benoit, 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 by the Cordova Ranger District in June 2016.

Alaska Landbird Monitoring Survey (ALMS) – Cordova Ranger District

This was the 12th year of implementing this point count protocol on the Chugach National Forest. Two ALMS blocks were surveyed in 2016 on the Cordova Ranger District. Locations included Alaganik and Okalee Blocks. All grids were successfully accessed and surveyed. One full-time technician and two 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 750 people attended, the vast majority were 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 316 people attended. The program was conducted in partnership with the Alaska Wildlife Conservation Center at their new boardwalk.

Copper River Delta Shorebird Festival: The 26th annual shorebird festival was held on May 5-8, 2016. 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.

### *Habitat Enhancement*

Portage Valley Lower Explorer Pond and Williwaw Creek: willow stakes, cottonwood stakes, and sedge clumps were planted along shorelines in a continuation of habitat improvement of waterfowl breeding habitat in Portage Valley area of the Chugach National Forest.

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## (BCR 5) OLIVE-SIDED FLYCATCHERS IN SOUTHEAST ALASKA, 2016 UPDATE

Catherine Pohl, Julie Koehler and Karla Hart, Catherine Pohl Biological Consulting

The following report summarizes research activities conducted on Tongass National Forest lands on Northeast Chichagof Island from 2014 to 2016.

Populations of the Olive-sided Flycatcher, *Contopus cooperi*, an aerial-feeding songbird, are declining across much of the breeding range in northern and mountainous areas of North America. As for several other long-distance migrants and aerial insectivores, the declines are precipitous and the cause is unknown. Breeding Bird Survey data from the U.S. and Canada point to annual declines of over 3% per year between 1980 and 2007 and a 76% decline in 40 years (Matsuoka and Pardieck, 2009; Butcher and Niven, 2007).

Olive-sided Flycatchers announce their presence in some of southeast Alaska's wetlands and forest openings, but they are not common and little is known concerning their status and distribution in the region-- or their habitat use, breeding phenology, reproductive success, or migratory connections. The species has been designated a priority in Alaska Landbird Conservation Plan for the southeast Alaska biogeographic region (Boreal Partners in Flight Working Group, 1999).

Olive-sided Flycatchers have been observed consistently since the mid-1990s at several stops on the two Breeding Bird Surveys on NE Chichagof Island. Most of these "stops" are at higher elevations in open forest and forest edges, including some combination of forested peatlands, subalpine slopes, streamside forest and regenerating clearcuts. At one location along route #435, the species was occasionally captured at a MAPS banding station, with evidence of breeding.

Olive-sided flycatchers were also observed at additional locations, including private forestlands, during C. Pohl's 2007 non-native plant survey of the Hoonah road system. In June 2013, with logistical support from the Tongass National Forest, and Jim Johnson (USFWS), C. Pohl located 40 active territories along roads on federal and private lands during a few days of informal surveys of the Hoonah road system, further confirming the potential of this area for research on this little-known and vulnerable species.

In 2014 we initiated a small capture/re-sight color-banding project focused on obtaining estimates of adult year-to-year (apparent) survival-- a parameter of particular interest given the population declines reported for this species across its range. Adult survival information may be helpful for comparison to populations in other locations and was suggested by the federal Bird Banding Laboratory as a baseline for future deployment of geolocators in Southeastern Alaska.

Informal road-based auditory surveys are first conducted on the Hoonah road system in late May or early June to document the presence of Olive-sided Flycatchers at known and additional sites and to prioritize capture efforts. The survey and mist net sites target higher elevation forest edges and openings on the Game Creek, Freshwater Bay, and False Bay portions of the Hoonah road system, including several valley head spurs. Ancillary data is collected concerning plumage and morphology to contribute to information on age, sex, and regional differences. Feather samples

are collected to contribute to analysis of wintering (or molting) areas. Habitat, foraging, and nesting observations are recorded opportunistically.

*2014 and 2015 Results:* Although capture success varied from day to day and site to site, we have found that the species can be effectively captured in our region with a single mist net and small crew (via audio playback and papier mache decoys), and color-banded individuals can be reliably re-sighted with high quality spotting scopes-- despite challenging conditions of Chichagof Island's coastal rainforest.

In early June of 2014 and 2015, we captured, uniquely color-banded, and re-sighted Olive-sided Flycatchers in the Suntaheen, Pavlov, Game Creek, Seagull Ck. and Freshwater Pass areas of the Hoonah road system. Several sites were re-visited later in the season to observe the behavior of pairs and recently banded birds. In 2015, we re-sighted 5 of the 6 color-banded birds from 2014, documenting impressive site fidelity and overwinter survival.

In 2015, J. Koehler found a nest high in a thin-canopy old growth hemlock, well away from its trunk, at the edge of a sloping clearcut and forested peatland. It was found during re-sighting efforts and may be the only record in southeastern Alaska; K. Hart documented the nest and nestlings with video. Prey included large dragonflies and bumblebees.

*2016 Results:* The 2016 season was also successful, with additional progress toward estimates of year-to-year survival and information on habitat and breeding biology. In 2016, we re-sighted 3 of the 6 birds banded in 2014 and 2 of the 4 banded in 2015. While our return rate has been somewhat variable, it approximates expected adult return/survival and should be sufficient for geolocator deployment in future seasons. Unbanded birds were present at most of the territories where we searched for, but did not find, previously banded individuals; territory occupancy appears to be even more consistent than return rate.

As in 2015, birds were wary of the nets at the majority of capture sites, particularly with wind or bright light. Five additional birds were captured and banded in 2016, although early season capture rates were lower than in previous years. In spite of an earlier start, we may have missed the "pre-incubation interval" due to the very warm spring.

We plan to continue re-sighting efforts in 2017. There is interest in extending the scope as originally conceived to include contaminant sampling and documentation of migration routes and wintering areas via geolocators and PinPoint GPS. We welcome an invitation to work aside others with such experience with this species, or other aerial insectivores, in late May of 2017. We may expand surveys and captures to adjacent private (native corporation) forestlands. We are also interested in conducting GIS analyses of occupancy and habitat, including use of newly available LIDAR data and detailed second growth vegetation mapping recently acquired by the Hoonah Indian Association and its TNC Sustainable Southeast Program partners.

*Acknowledgments:* The waiver of fees, timely permit review, bunkhouse space and other assistance was provided by the Hoonah and Juneau Ranger Districts. Juneau collaborators Julie Koehler and Karla Hart made key contributions and donated their prodigious field skills to the project. Hoonah birding guide Amy Clark Courtney, educator/adventurers Ben McLuckie and

Stephanie Harold, and the late USFS HRD wildlife biologist Jack Ruggerello generously assisted with captures.

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#### (BCR 6 & 7) LANDBIRD MONITORING IN THE NORTHWEST TERRITORIES

Samuel Hache and Rhiannon Pankratz, Environment And Climate Change Canada, Yellowknife, Northwest Territories, Canada.

Key mandates for Environment and Climate Change Canada (ECCC) include understanding distribution, abundance, habitat association, and trends in populations of migratory birds and species at risk (SAR) in Canada to inform conservation strategies (i.e. monitor and conserve). The Landbird Program of the Eastern Arctic Unit (Northern Region) monitors bird populations in the boreal portion of the Northwest Territories and Nunavut. In 2016, two new monitoring programs were initiated in BCR 6 and 7 (*Edhezhie Landbird Monitoring Program* and *Winter Road Landbird Monitoring Program*) and fieldwork was completed for directed studies that aim to quantify effects of natural disturbances and better understand the ecology of SAR. Below is an overview of these projects.

*Edhezhie Landbird Monitoring Program:* Edézhíe (Horn Plateau) is a candidate National Wildlife Area (NWA) being proposed through the process outlined in the Northwest Territories Protected Areas Strategy. The candidate NWA (~ 14,000km<sup>2</sup>) is located between Fort Providence, Jean Marie River, Fort Simpson, and Wrigley (BCR 6). In May 2016, Automated Recording Units (ARUs) were deployed at 41 study sites systematically distributed across the NWA (20 km apart; total of 205 sampling stations). Each ARU was preprogrammed to record for 10 minutes on the hour - 1 hour before sunset and each hour until 5 hours after sunrise. Additional 10 minutes were recorded at sunrise, 12:00 AM, and 15:00. Data were collected each day from early May to late July. Recordings are currently being interpreted for community-level assessments and classification algorithms (i.e. recognizers) are being used to determine

presence/absence of SAR (i.e. Olive-sided Flycatcher, Common Nighthawk, Rusty Blackbird, Canada Warbler, and Yellow Rail). A manuscript presenting results from species distribution models and population size estimates for the study area should be submitted to a peer-reviewed journal in December 2017.

*Winter Road Landbird Monitoring Program:* ARUs can be deployed along winter roads to provide important data along latitudinal gradients and increase geographic coverage of landbird monitoring programs in northern boreal regions at relatively low costs. Preliminary results from a pilot study (winter 2015 - deployment and winter 2016 - retrieval; n = 9 units) conducted along the Tibbitt to Contwoyto winter road (BCR 7) suggest that some species poorly monitored on their Canadian breeding grounds are present at relatively high densities (e.g. Harris Sparrow, White-crown Sparrow, Grey-cheeked Thrush, American Tree Sparrow, Blackpoll Warbler, etc.). In March 2016, we deployed 100 ARUs along the same winter road using a *Generalized Random Tessellation Stratified (GRTS)* sampling design. These units will be retrieved in February 2017 and acoustic data from April to July 2016 will be interpreted using a similar protocol (community and SAR) being used for the *Edhezhie Landbird Monitoring Program*. A technical report presenting baseline data for this monitoring program should be available in September 2017.

*Fire Severity:* A directed study was conducted to quantify the effects of forest fire severity on landbird communities (Michelle Knaggs - MSc candidate, University of Alberta). The project started in 2015 following the large forest fires of 2014 along Highway 3 between Behchokò and Fort Providence (BCR 6). In June 2016, ARUs were deployed at 28 study sites (448 sampling stations). For each station, acoustic data was collected for 4 days following a similar recording schedule used for the *Edhezhie Landbird Monitoring Program*.

*Phenology of Signing Rate in Olive-sided Flycatchers:* In the same study area as the *Fire Severity Project*, another directed study evaluated the potential of ARU-based data to infer demographic processes (i.e. spring arrival date and pairing/nesting success) based on variation in signing rate and inform Critical Habitat Identification for the Olive-sided Flycatcher (Emily Upham-Mills - MSc candidate, UofA). Field observations were used to identify the demographic processes underlying changes in song phenology recorded by ARUs throughout the breeding season. These MSc projects are in collaboration with Dr. Erin Bayne. Manuscripts from these projects should be submitted to peer-reviewed journals in December 2017.

*Population Genetic Structure of Canada Warbler:* Novel microsatellite markers were used to conduct population genetic analyses from feather samples of Canada Warblers collected in the Liard Valley (n = 40; BCR 6), New Hampshire, and North Carolina. Lack of genetic differences between Canada Warblers breeding in Fort Liard and New Hampshire suggests a panmictic population across boreal and hemiboreal regions, whereas birds from North Carolina (i.e. southern limit of the species breeding range) were considered a different genetic unit (Ferrari et al. in prep.). This project is in collaboration with Dr. Richard Chandler and Dr. Joe Nairn of the University of Georgia, and Dr. Len Reitsma of Plymouth State University.

*Delineation of Northern Breeding Range Limits:* Along with ECCC colleagues from Eastern and Western Arctic Units, a collaboration with the Boreal Avian Modelling Project

([www.borealbirds.ca](http://www.borealbirds.ca)) was initiated to collect as much avian data as possible from the Northern Region (Yukon, Northwest Territories, and Nunavut) and store the information in a standardized database. The main goal is to build an analytical framework that will allow for the use of an automated approach to delineate northern limits of the known distribution of breeding birds to identify gaps in geographic coverage.

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## (MULTIPLE BCR'S) UPDATE ON THE BOREAL AVIAN MODELLING PROJECT

Nicole Barker, Boreal Avian Modelling Project

The Boreal Avian Modelling (BAM) Project was founded in 2005 to address critical knowledge gaps challenging the management and conservation of boreal birds in Canada (Cumming et al. 2010). In 2010, the program expanded to include boreal forest regions of Alaska, the Upper Midwest, and New England. BAM develops, distributes, and applies statistical models of avian populations and the impacts of human activity on boreal bird species. Our work draws upon a powerful database created through a large initial investment in assembling and harmonizing data from individual research and monitoring efforts conducted in the Canadian and US boreal & hemi-boreal forest (Sólymos et al. 2013, Barker et al. 2015). As of 2015, BAM's Avian Database included data from over 210,000 point-count locations across North America's boreal forest region (Barker et al. 2015).

BAM has continued work to standardize avian data to be used in common models. Most recently we explored methods to combine roadside point count data with off-road point count data, and to combine traditional human point count data with data from automated recording units. BAM's recently completed and ongoing work analyzing these point count data addresses questions regarding (1) impacts of energy-sector development on avian density in the Alberta oil sands, (2) the ability of local-scale models to predict avian density at larger scales, (3) range expansion to Alaska with climate change (Stralberg et al. 2016), (4) national impacts of human-induced forest change, (5) how avian density varies with forest fragmentation and forest stand attributes, and (6) how inter-annual variability in avian breeding density is affected by factors on the breeding and wintering grounds. This year, we also explored new methods to model avian density (Ball et al. 2016); boreal-wide models using this method are in progress.

BAM's spatially explicit national models of avian density (Barker et al. 2014, Haché et al. 2014, Stralberg et al. 2015b) have been used to (1) recommend conservation planning approaches that account for climate change refugia (Stralberg et al. 2015a), (2) identify Zones of Interest for migratory birds in the boreal (see account in this report, page 17) and (3) inform conservation planning and prioritization efforts of the Canadian Boreal Forest Agreement, Northwest Boreal Landscape Conservation Cooperative, Nature Conservancy of Canada, and Ducks Unlimited

Canada, Parks Canada, and Alberta Environment and Parks. They are also being used to inform Critical Habitat identification for Species at Risk in Canada (Haché et al. 2014).

The BAM website ([www.borealbirds.ca](http://www.borealbirds.ca)) includes information on avian breeding densities by habitat type, maps of avian distribution, and recommendations on conducting point-count surveys. Spatially explicit models of species' distribution and abundance relative to current and future climates across the boreal forest are now available as maps on DataBasin (<http://borealbirds.databasin.org>). BAM's annual and technical reports and publications are available at [www.borealbirds.ca/library/](http://www.borealbirds.ca/library/).

BAM includes the following individuals:

*Steering Committee:* Erin Bayne (U.Alberta), Steve Cumming (U.Laval), Fiona Schmiegelow (U.Alberta), and Samantha Song (ECCC-CWS). *Staff:* Nicole Barker (Coordinating Scientist, U.Alberta), Trish Fontaine (Spatial Database Manager, U.Alberta), Diana Stralberg (Ecologist, U.Alberta), and Péter Sólymos (Statistical Ecologist, U.Alberta). *Post-doctoral fellows and students:* Alberto Suarez-Esteban (U.Alberta), Lionel Leston (U.Alberta), Tara Stehelin (U.Alberta). *Contributing Scientists:* Samuel Haché (ECCC-CWS), Lisa Mahon (ECCC-CWS), Steve Matsuoka (USGS), Steve Van Wilgenburg (ECCC-CWS), Alana Westwood (independent), and Judith Toms (ECCC-CWS). *Technical Committee:* Marcel Darveau (DUC), André Desrochers (U.Laval), Pierre Drapeau (UQAM), Charles Francis (ECCC-CWS), Colleen Handel (USGS), Keith Hobson (UWO), Craig Machtans (ECCC-CWS), Julianne Morissette (DUC), Gerald Niemi (U.Minnesota), Rob Rempel (OMNRF), Stuart Slattery (IWWR), Phil Taylor (BSC), Lisa Venier (CFS), Pierre Vernier (U.Alberta), and Marc-André Villard (U.Moncton).

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## (MULTIPLE BCR'S) NORTH AMERICAN BREEDING BIRD SURVEY, ALASKA 2015 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 2015 (Fig. 1). Through the dedication of many observers, the program has now run 87 routes for  $\geq 10$  years and 46 routes for  $\geq 20$  years. Six routes have been run for 30 years or more: Juneau, Seven Lakes (30 years), Anchor River, Galena (31 years), Little Salcha (32 years), and Swan Lake Road (34 consecutive years!). In 2015, BBS surveys were conducted on 56 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 (<https://www.pwrc.usgs.gov/bbs/RouteMap/Map.cfm>) with the goal of running a minimum of 70 routes in 2017.

Long-term trends of species from 1966 to 2013 are available for most Bird Conservation Regions and states and provinces (Sauer et al. 2014, Environment Canada 2014). Alaska trends are not currently available on the website. However, John Sauer and his colleagues have a paper in press with the *Journal of Fish and Wildlife Management* that includes new BBS trend estimates for Alaska birds. John Sauer and Colleen Handel also recently submitted a paper as part of a special section on the BBS that includes trend estimates for birds in Alaska calculated from a

combination of data from the BBS and the Alaska Landbird Monitoring Surveys. Thus, keep an eye out for these new papers in 2017.

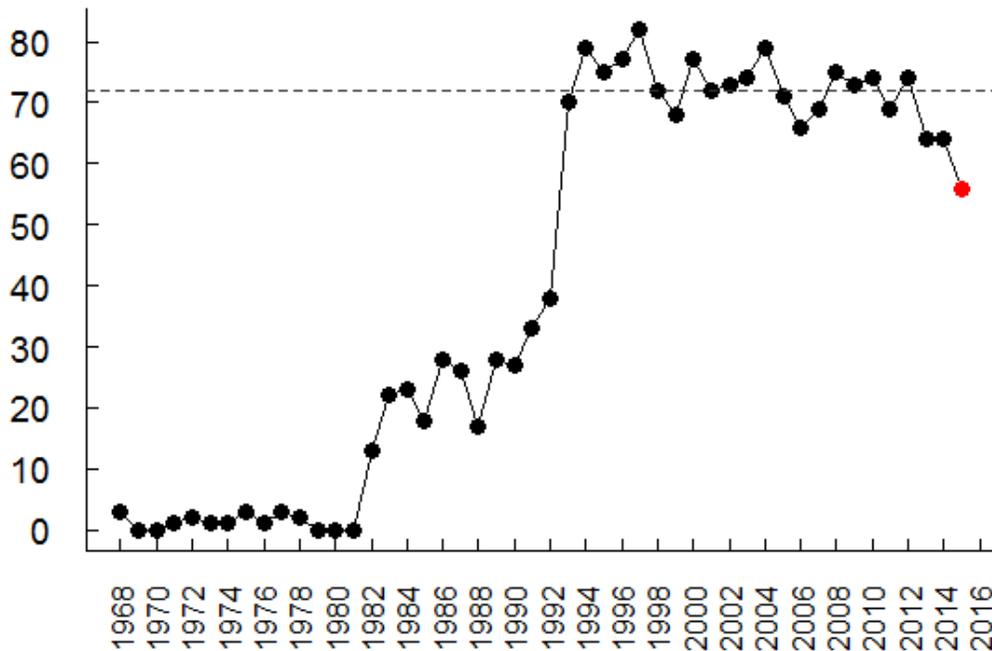


Fig. 1. Annual number of routes (y-axis) surveyed in Alaska as part of the BBS, 1968–2015. Reference line is the mean number of routes surveyed 1993–2015 (72 routes).

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#### (MULTIPLE BCR'S) BEAK DEFORMITIES IN ALASKA : A NEW VIRUS IDENTIFIED

Colleen M. Handel, Caroline Van Hemert, Lisa M. Pajot, and Rachel Richardson, USGS Alaska Science Center; Maxine Zylberberg and Joe DeRisi, University of California San Francisco; Jack Dumbacher, California Academy of Sciences

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 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 have recently discovered a novel picornavirus, provisionally named Poecivirus, that is strongly associated with AKD in Alaskan birds (Zylberberg et al. 2016). We applied metagenomic next-generation sequencing to various tissues of Black-capped Chickadees affected

and unaffected by AKD and detected Poecivirus in 19/19 (100%) of the affected birds and only 2/9 (22%) of the unaffected birds. Subsequent efforts have confirmed this association with larger sample sizes of Black-capped Chickadees from buccal swabs and cloacal swabs. In total, 26/26 (100%) individuals with AKD and only 2/80 (2.5%) control individuals were infected. Thus, individuals with AKD are significantly more likely to be infected with Poecivirus than expected by chance ( $p < 0.0001$ , likelihood Chi square test). We also detected a closely related picornavirus in two Northwestern Crows and two Red-breasted Nuthatches that showed pathology consistent with AKD. This virus is now the prime candidate etiological agent of AKD and we are currently designing an experiment to determine whether Poecivirus replicates in an avian host, whether it is transmissible between avian hosts, how it is transmitted between avian hosts, and whether infection with Poecivirus is sufficient to cause AKD.

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#### (MULTIPLE BCR'S) ROAD-SYSTEM GROUSE AND PTARMIGAN ABUNDANCE SURVEYS, ALASKA, 2016 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 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), Palmer (1992), and Tok (2014) and have been completed annually since their inception. Sharp-tailed Grouse lek surveys were established in the Delta Junction Agricultural Project (2000) near

Delta Junction, and on state lands near Tok (2014). The average number of males per lek is used as a relative index of abundance. Sooty Grouse roadside and trail transects with listening posts approximately every 0.5 mile were established in Juneau and Petersburg (2015) and have been completed annually. Willow and Rock Ptarmigan roadside and walking surveys have been established along the Denali (1997), Parks (2000), Richardson (1997), Steese (2007), and Taylor (2015) highways and within the Anchorage bowl (2008), Denali National Park (2014), and on the Kenai Peninsula (2014).

A broadcasted recording is used for assessing the breeding population of male Willow and Rock Ptarmigan along established transects. Willow and Rock Ptarmigan roadside and walking surveys have been established along the Denali (1997), Parks (2000), Richardson (1997), Steese (2007), and Taylor (2015) highways, and within the Anchorage bowl (2008), Denali National Park (2014), and the on Kenai Peninsula (2014). In addition to the broadcast recording and since spring 2015, the Small Game Program has conducted spring breeding surveys of male territorial Rock Ptarmigan near Eagle Summit as part of a larger research project using distance sampling methodology (Buckland et al. 2001).

Based on surveys in spring 2016, monitored populations are generally abundant and widespread. Interior Ruffed Grouse populations are stable to increasing in abundance after reaching a low in 2010-11. Sharp-tailed Grouse populations near Delta Junction and Tok appear to be relatively stable. Sooty Grouse densities are also abundant near Juneau and Petersburg although it is difficult to know how this relates to historical densities with only two years of data. Monitored Willow and Rock Ptarmigan populations throughout the road system appear to be at average to higher abundance than in recent years. However ptarmigan populations throughout the Alaska Peninsula and southwest Alaska appear to be lower than in recent years.

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#### *Literature Cited*

Carroll, C. J., R. A. Merizon. *In Prep.* Status of Grouse, Ptarmigan, and Hare in Alaska, 2015-2016. Alaska Department of Fish and Game, Wildlife Management Report ADF&G/DWC/WMR-2017-XX, Palmer, Alaska.

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(MULTIPLE BCR'S) STATEWIDE HUNTER HARVESTED GROUSE AND PTARMIGAN WING COLLECTION PROGRAM, ALASKA, 2016 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 5 hunting seasons (2011/12 - 2015/16) has received samples from over 215 hunters statewide. During the 2015 regulatory year (RY; July 1, 2015 to June 30, 2016) hunters provided wings from 152 Ruffed, 486 Spruce, 113 Sharp-tailed, and 20 Sooty Grouse in addition to 379 Willow, 73 Rock, and 79 White-tailed Ptarmigan wings statewide (R. Merizon pers. communication). 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 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 2016 hunters have provided nearly 600 samples statewide.

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## (MULTIPLE BCR'S) BLOOD PARASITES IN LANDBIRD HOSTS IN ALASKA

Caroline Van Hemert, Colleen Handel, and Matthew Smith, USGS Alaska Science Center

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, diversity, fitness effects, and potential vectors 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. Between 2012 and 2015, we sampled more than a thousand passerines at three sites on the Seward Peninsula for analysis of blood parasite

infections. We also collected samples of mosquitoes, midges, and biting flies to evaluate the effects of habitat on vector abundance. Lab work is ongoing but preliminary analyses have detected *Leucocytozoon*, *Haemoproteus*, and *Plasmodium* in avian samples and *Leucocytozoon* in arthropods. Future work will address relationships between habitat, host factors, and rates of infection as well as identification of likely vectors.

- 2) 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 PCR from samples collected 2013-2016.
- 3) As part of our work on *Plasmodium* in resident Black-capped Chickadees, in 2016 we sampled mosquitoes from south-central Alaska for analysis of blood parasites. Identification of *Plasmodium* in vectors would provide the first such evidence in Alaska and facilitate understanding of the potential effects of climate change on patterns of blood parasite infection in Alaskan songbirds.

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## APPENDIX 1. RECENT BPIF MEMBER PUBLICATIONS

Stralberg, D., S. M. Matsuoka, C. M. Handel, F. K. A. Schmiegelow, A. Hamann, and E. M. Bayne. 2016. Biogeography of boreal passerine range dynamics: past, present, and future. *Ecography*. doi:10.1111/ecog.02393

Stralberg, D. 2016. Projecting boreal bird responses to climate change considering uncertainty, refugia, vegetation lags, and post-glaciation history. PhD Thesis. University of Alberta, Edmonton, Alberta. <https://era.library.ualberta.ca/files/cw3763683p#.WHIT1MrKpo>

## 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. However, circumboreal collaboration is reflected in this report. For more information on the BCR concept, see <http://nabci-us.org/committee/>.