



Alaska Shorebird Group

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*Annual Summary Compilation:*  
**New or ongoing studies  
of Alaska shorebirds**

**December 2017**



Black Oystercatcher defending its nest in Katmai National Park and Preserve; Project # 8. Photo: Brian Robinson.

## EXECUTIVE SUMMARY

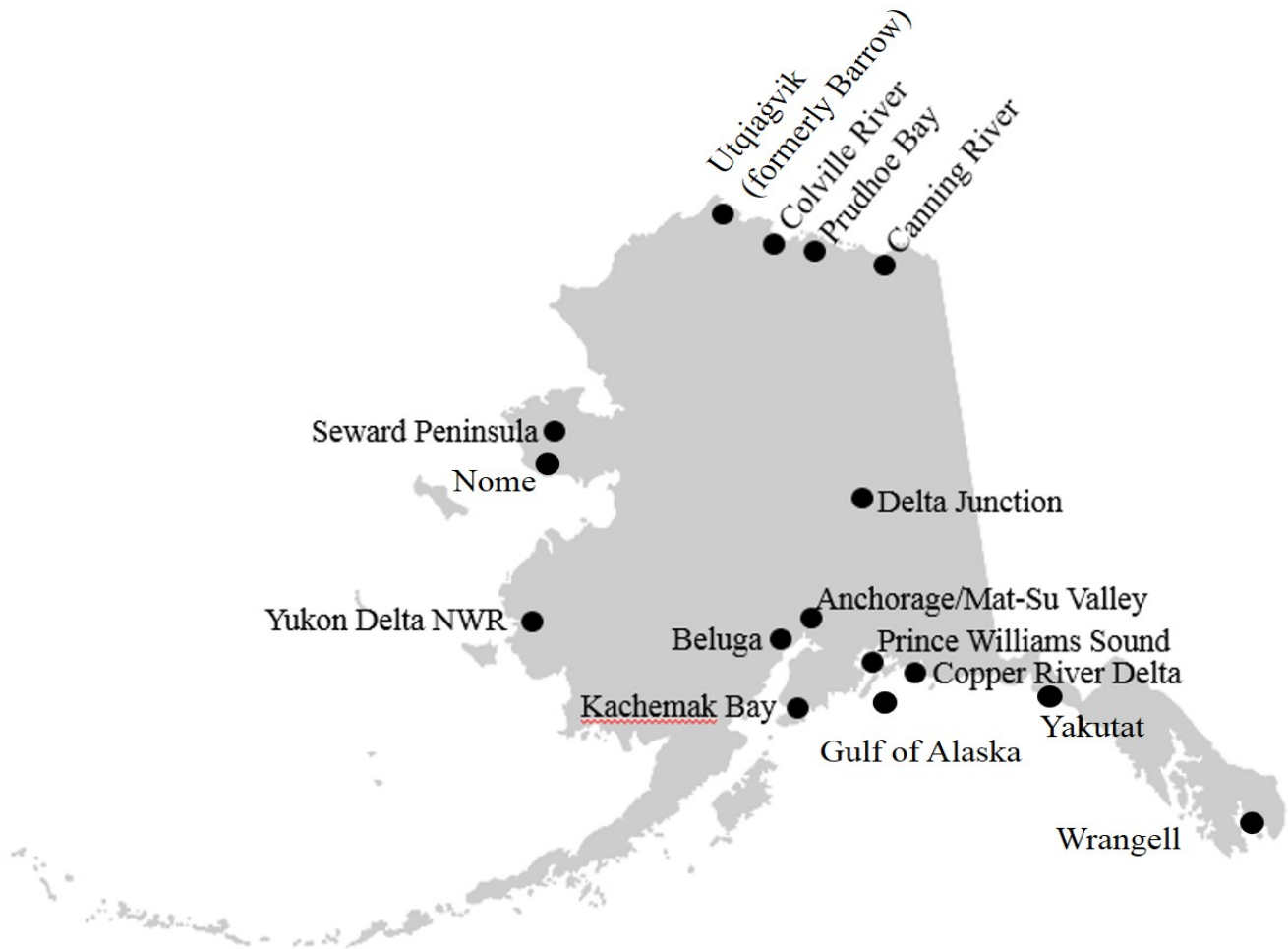
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Welcome to the 2017 summary report of ongoing or new studies of Alaska shorebirds. This is the seventeenth consecutive report put together by the Alaska Shorebird Group. In this document, members of the Alaska Shorebird Group compiled annual summaries for 29 studies, highlighting many interesting projects investigating Alaska shorebirds. The Alaska Shorebird Group continues to be a highly collaborative organization with a large membership of productive principal investigators. This annual compilation is the only written record we have of projects addressing shorebirds occurring in the state of Alaska and provides a valuable timeline of shorebird science activities for this region.

The map of our study site locations within Alaska (next page) shows the statewide distribution of projects. Additionally some projects include work that occurs outside of Alaska; this is indicated in each project description. Much of the work in Alaska was conducted at arctic breeding sites and in south-central Alaska, with additional studies in western and interior Alaska. I would also like to thank all of the talented photographers who submitted their images for use in this document. Photo credits (when given) and a brief caption are listed for each photo.

Thank you to the principal investigators for making contributions to this year's annual summary report, as well as huge thanks to all the field biologists for their valiant efforts in conducting these important field studies in Alaska. We look forward to many more years of fruitful research and conservation of Alaska's breeding and migratory shorebirds.

Kim Jochum, Ph.D.  
Secretary, Alaska Shorebird Group



Dispersal of 2017 Alaska Shorebird Group projects throughout Alaska. Locations may represent more than one project.

Many projects also are conducted or extend outside of Alaska, are cross-arctic projects, or landscape-scale projects (see individual project summaries for more detail).

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## #1— PRUDHOE BAY LONG-TERM NEST MONITORING

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Investigators: Rebecca Bentzen, Arctic Beringia Program, Wildlife Conservation Society;  
Martin Robards, Arctic Beringia Program, Wildlife Conservation Society

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Since 2003, the Wildlife Conservation Society, in cooperation with BP Exploration (Alaska), Inc., has monitored nest survivorship, nest predator abundances, predator identity, and other parameters that may influence nesting success in the Prudhoe Bay Oilfield. This ongoing monitoring effort is allowing a better understanding of potential impacts from industry, climate change, and other factors on breeding birds.

In 2017 we discovered and monitored 84 nests of 10 tundra-nesting species (7 shorebird species) from 11 June to 8 July on 12 10-ha study plots using both rope drag and behavioral nest search techniques. Semipalmated Sandpiper, Pectoral Sandpiper, and Lapland Longspur nests accounted for the majority (61%) of those found. Of the 84 nests found, 54 were successful, 17 were predated, 1 was abandoned, 1 failed due to a researcher, and 11 were unknown (Table 1.1). These numbers are lower than for previous years; we located 106 nests on the plots in 2016, 123 nests in 2015, and 130 nests in 2014. Lower nest numbers may be due to the late spring (relative to recent years) and increased snow and ice during nest initiation. Particularly affected were Red-necked Phalaropes and Long-billed Dowitchers, whose nest numbers were much lower than last year, possibly since they nest in wetter environments that were frozen longer than the upland areas.

*Location:* Prudhoe Bay, Alaska, Arctic coastal plain: 70.30754°N, 148.6104°W

*Contact:* Rebecca Bentzen, Arctic Beringia Program, Wildlife Conservation Society, 3550 Airport Way unit 5, Fairbanks, AK, 99709, Email: rbentzen@wcs.org, Phone: 907-505-0071.

Table 1.1. Numbers and fates of nests found on the long-term nest monitoring plots in Prudhoe Bay, 2017

| Species                     | Nests | Predation | Success | Unknown | Abandoned | Other |
|-----------------------------|-------|-----------|---------|---------|-----------|-------|
| <b>Shorebirds</b>           |       |           |         |         |           |       |
| Semipalmated Sandpiper      | 23    | 5         | 14      | 4       | 0         | 0     |
| Pectoral Sandpiper          | 10    | 2         | 4       | 4       | 0         | 0     |
| Long-billed Dowitcher       | 3     | 1         | 1       | 0       | 0         | 1     |
| Stilt Sandpiper             | 4     | 0         | 3       | 1       | 0         | 0     |
| Red-necked Phalarope        | 7     | 1         | 5       | 0       | 1         | 0     |
| Red Phalarope               | 3     | 0         | 1       | 2       | 0         | 0     |
| Dunlin                      | 4     | 0         | 4       | 0       | 0         | 0     |
| <b>Waterfowl</b>            |       |           |         |         |           |       |
| Greater White-fronted Goose | 10    | 1         | 9       | 0       | 0         | 0     |
| Cackling Goose              | 2     | 2         | 0       | 0       | 0         | 0     |
| <b>Passerines</b>           |       |           |         |         |           |       |
| Lapland Longspur            | 18    | 5         | 13      | 0       | 0         | 0     |
| <b>Total</b>                | 84    | 17        | 54      | 11      | 1         | 1     |



Figure 1.1. Mist netting Buff-breasted Sandpipers at Prudhoe Bay.

## #2 — MONITORING SEMIPALMATED PLOVERS BREEDING AT EGG ISLAND, COPPER RIVER DELTA

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Investigators: Mary Anne Bishop, Prince William Sound Science Center and Erica Nol, Trent University

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North American shorebirds have experienced population declines over the last several decades. Semipalmated Plover, however, is one shorebird species whose numbers are apparently stable. Building on research conducted in 2006 and 2008, we began a study in 2011 on a breeding population of Semipalmated Plovers at Egg Island, a barrier island on Alaska's Copper River Delta. The objectives of our study are to monitor breeding phenology and to determine survivorship based on return rates of banded breeders. Between 4 and 7 June 2017 we located 7 plover nests. In all, we banded 7 Semipalmated Plover adults but surprisingly resighted only 5 banded birds from previous years. Additional field work is planned for Egg Island in 2018.

*Location:* Copper River Delta: 60° 22.7'N, 145° 53.6'W

*Contact:* Mary Anne Bishop, Prince William Sound Science Center, PO Box 705, Cordova, AK 99574. Phone: 907-424-5800 x 228; email: mbishop@pwssc.org.



### #3— BLACK OYSTERCATCHER SURVEYS IN PRINCE WILLIAM SOUND – 2017 FOREST PLAN MONITORING

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Investigators: Melissa Gabrielson, U.S. Forest Service, Cordova, AK; Ramiro Aragon Perez, U.S. Forest Service, Cordova, AK

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Black Oystercatchers are listed as a “species of high concern” in the U.S. Shorebird Conservation Plan, a “focal species” for the U.S. Fish & Wildlife Service (USFWS), a “management indicator species” for the Chugach National Forest (CNF), and a “sensitive species” for the U.S. Forest Service Alaska Region. The Chugach Forest Plan (2002) advises monitoring population trends, habitat relationships, and habitat changes for nesting Black Oystercatchers in Prince William Sound (PWS). The Chugach National Forest has been monitoring Black Oystercatcher nest locations in PWS since 1999.

The sampling design for this survey was developed in an attempt to retain the historically important survey areas while incorporating shoreline segments from the entire PWS. A regional sampling approach was used to minimize travel time and expenses. In addition, this split-panel rotating design was developed to provide a balance between estimation of trend and estimation of yearly status. A split-panel rotating design also has the advantage of allowing more shorelines to be visited during the life of the monitoring program, which provides more opportunity to detect changes in the spatial distribution of nesting Black Oystercatchers in PWS.

In June 2017, the following areas were surveyed in Prince William Sound: Port Chalmers, Dutch Group, Harriman Fjord, Rocky Bay, Port Etches/Hitchenbrook, Barry Arm/Coxe Glacier, Blackstone Bay, and Ingot Island (Figure 3.1).

Overall, 101 (breeding and non-breeding) adults, 15 active nests, 29 total eggs, and 2 chicks were observed during the 2017 survey. In addition, 16 active Black Oystercatcher nesting territories were identified during the survey with the greatest density occurring at Port Chalmers on Montague Island ( $n = 5$ ). The greatest number of Black Oystercatcher encounters ( $n = 45$ , breeding and nonbreeding) also occurred at Port Chalmers (Table 3.1).

Data from the 2017 survey will be entered into the CNF Black Oystercatcher GIS database. A six-year analysis is currently being conducted to a) identify any Black Oystercatcher trends and assess the strength of evidence that an overall trend exists, and b) suggest potential changes on the sampling design and survey method. Future analysis will continue to compare Black Oystercatcher populations and human-use effects across Prince William Sound.

*Location:* Prince William Sound (landscape-scale project with multiple study sites), 2017 sites listed in Table 3.1.

*Contact(s):* Melissa Gabrielson, U.S. Forest Service, Chugach National Forest, Cordova Ranger District; PO Box 280, Cordova, AK 99574; Phone: (907) 424-7661 x 243; Email: melissalgabrielson@fs.fed.us

Table 3.1. 2017 Black Oystercatcher results by survey location.

| Sites/transects                 | Total Adults  | Nesting territories | Active Nests | Total of eggs | Total of chicks |
|---------------------------------|---------------|---------------------|--------------|---------------|-----------------|
| Port Chalmers (Montague Island) | 45            | 5                   | 5            | 10            | 1               |
| Dutch Group                     | 20            | 3                   | 2            | 3             | 1               |
| Harriman Fjord                  | 10            | 3                   | 3            | 5             | 0               |
| Rocky Bay (Montague Island)     | 6             | 0                   | 0            | 0             | 0               |
| Port Etches/Hitchenbrook        | 4             | 1                   | 1            | 2             | 0               |
| Barry Arm/Coxe Glacier          | 5             | 1                   | 1            | 3             | 0               |
| Blackstone Bay                  | 7             | 1                   | 1            | 2             | 0               |
| Ingot Island                    | 4             | 2                   | 2            | 4             | 0               |
| <b>Total</b>                    | <b>101</b>    | <b>16</b>           | <b>15</b>    | <b>29</b>     | <b>2</b>        |
| <b>Range (Min-Max)</b>          | <b>(4-45)</b> | <b>(0-5)</b>        | <b>(0-5)</b> | <b>(0-10)</b> | <b>(0-1)</b>    |
| <b>Mean</b>                     | <b>12.6</b>   | <b>2.0</b>          | <b>1.9</b>   | <b>3.6</b>    | <b>0.3</b>      |

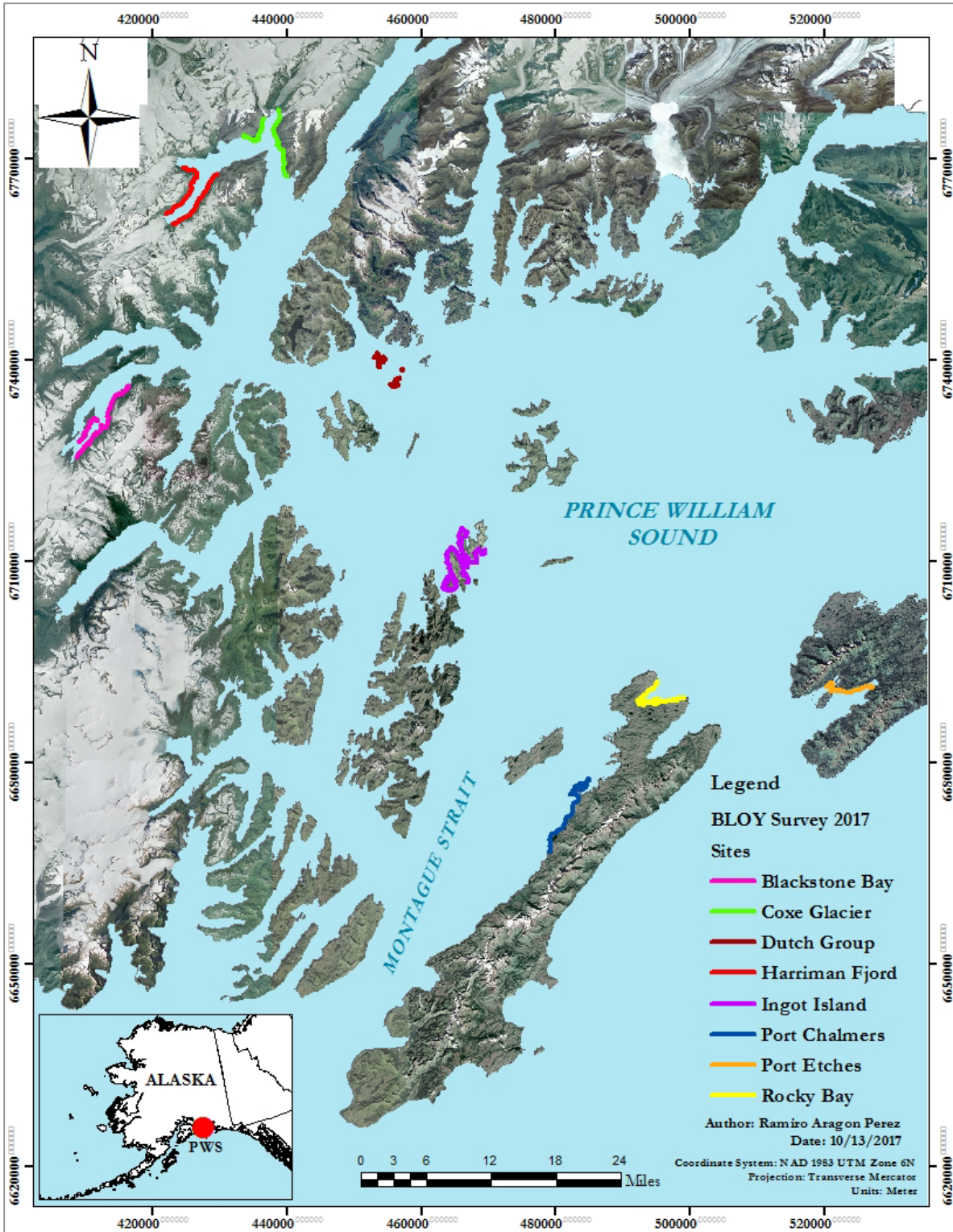


Figure 3.1. Black Oystercatcher transects monitored in Prince William Sound during 2017 survey.





*Figure 3.2.* Black Oystercatcher observed during 2016 surveys in Prince William Sound. Photo Credit: Matthew Prinzing, SCA Intern, USFS.



*Figure 3.3.* Black Oystercatcher nest found during 2017 surveys in Prince William Sound. Photo Credit: Christine Smith, USFS





*Figure 3.4. Black Oystercatcher chick found during 2017 surveys in Prince William Sound. Photo Credit: Melissa Gabrielson, Wildlife Technician, USFS.*



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## #4— SHOREBIRDS & PATHOGENIC AVIAN INFLUENZA EMERGENCE IN ALASKA

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Investigators: Nichola Hill, Tufts University; Mary Anne Bishop, Prince William Sound Science Center; Jonathan Runstadler, Tufts University

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The inter-hemispheric movement of influenza places Arctic- and sub-Arctic-breeding shorebirds at high risk of infection with novel, pathogenic strains. This study aims to understand the exposure of Alaskan shorebirds to infection by both low and high pathogenic avian influenza. Our sampling took place on the Copper River Delta because of its importance as a spring migration stopover area. Between 2 and 12 May 2017, we captured primarily Western Sandpiper (*Calidris mauri*,  $n = 180$ ) and Least Sandpiper (*C. minutilla*,  $n = 68$ ) at Hartney Bay on Orca Inlet. For each shorebird, both cloacal and pharyngeal swabs as well as a blood sample were collected. Samples are currently being tested for influenza with preliminary results indicating a prevalence of 4%. This study will be continued during spring 2018 with the goal of understanding how transmission occurs between shorebirds, gulls and ducks that co-mingle at Orca Inlet during spring migration. The 2008 Alaska Shorebird Conservation Plan identifies disease as a major conservation issue for Alaska shorebirds, including direct or indirect effects of virulent avian-borne diseases.

*Location:* Copper River Delta ; 60° 30'N, 145° 51.9'W

*Contact:* Mary Anne Bishop, Prince William Sound Science Center, PO Box 705, Cordova, AK 99574. Phone: 907-424-5800 x 228; email: mbishop@pwssc.org.



Figure 4.1. Sampling a Least Sandpiper for avian influenza, 2017. Photo by N. Hill.



*Figure 4.2.* Team Cordova avian influenza samplers.

## #5—EWHALE LAB SHOREBIRD PROJECTS

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Investigators: Falk Huettmann, EWHALE lab, University of Alaska Fairbanks

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The EWHALE lab works on the data of several shorebird projects. Recent field work and exploration was done in Hangzhou Bay near Shanghai, East China Sea, as well as Mongolia, Taiwan, Bangladesh and Papua New Guinea. New work is funded to support international avian influenza explorations. The new publication (Zoeckler et al. 2016) deals with Spoon-billed Sandpipers from the Bering Sea wintering in tropical areas (the latter was previously not so well-known). So here is a first machine-learning approach using model-predictions that we started at UAF with PhD student K. Herrick (Akasofu) in 2012 and that seems to match real-world data pretty well (Bangladesh, Myanmar and China come up as hotspots, Papua New Guinea does not).

Work of this sort has much merit, we find, because it shows best-compiled data for such a species and habitats of major international conservation concern. It was never done before, it involves the Alaska Bering Sea region as a flyway, and can be projected into future scenarios of the entire Pacific Rim using development and climate change scenarios that are of urgent conservation relevance. Finally, it is relatively cheap and easily done (e.g., no birds get stressed through heavy gear attachments or catching/banding) even when compared to other research-intensive flyway subjects that have equal or less conservation progress and data to show to the global public.

*Location:* Hangzhou Bay near Shanghai, East China Sea, as well as Mongolia, Taiwan, Bangladesh and Papua New Guinea

*Contact(s):* Dr. Falk Huettmann, Biology and Wildlife Department, Institute of Arctic Biology, University of Alaska-Fairbanks; Phone: 907-474-7882; Email: fhuetmann@alaska.edu

## #6— SUBSPECIFIC MIGRATION ECOLOGY AND REGIONAL CONSERVATION PRIORITIES FOR AN ARCTIC BREEDING SHOREBIRD, THE DUNLIN (*CALIDRIS ALPINA*)

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Investigators: Ben Lagasse and Mike Wunder, University of Colorado Denver; Richard Lanctot, Chris Latty, Sarah Saalfeld, and Kristine Sowl, U.S. Fish and Wildlife Service; Stephen Brown, Manomet Center for Conservation Science; Rebecca Bentzen and Martin Robards, Wildlife Conservation Society; Olivier Gilg, University of Burgundy, Groupe de Recherche en Ecologie Arctique, Frencheville, France; Rob van Bemmelen, Wageningen University, Netherlands; Aleksandr Sokolov; Jannik Hansen, Aarhus University, Denmark; Pavel Tomkovich, Lomonosov Moscow State University, Russia; Velli-Matti Pakanen, University of Oulu, Finland; Laura McKinnon and Leah Wright, York University, Canada; Barbara Ganter and Hans-Ulrich Rosner, Husum, Germany; Olga Valchuk, Institute of Biology and Soils, Vladivostok, Russia; Konstantin Maslovsky, Far Eastern University, Vladivostok, Russia; Alexei Dondua, St. Petersburg, Russia; Ekaterina and Alexander Matsyna, Moscow, Russia

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Understanding the spatiotemporal connectivity of migratory populations is essential for developing landscape-scale conservation plans. The Dunlin is a migratory shorebird with 10 subspecies that breed throughout the circumpolar Arctic and Subarctic (Figure 6.1). These subspecies migrate south, sometimes with other subspecies and sometimes alone, along most of the eight flyways emanating from the Arctic. Many of these subspecies are showing declines. Understanding the spatiotemporal extent that subspecies segregate or mix while migrating together is important for directing conservation efforts in the appropriate locations. This is particularly true along the East Asian-Australasian Flyway given the extensive alteration and loss of habitat (e.g., intertidal habitats around the Yellow Sea have declined by >65%), and large differences in population sizes of the four subspecies that use this area (*C. a. actites* number <1000 and the others are <550,000).

The primary objectives of this study are to generate spatiotemporally explicit migratory tracks for Dunlin from 18 breeding sites throughout the circumpolar Arctic using archival light-level geolocators (Figure 6.1). With this information, we plan to identify 1) migratory bottlenecks and subspecific regions of conservation priority at the flyway level, 2) the extent different subspecies mix during migration and on terminal wintering grounds, and 3) possible sex-specific differences in distribution and migratory timing.

Between 2010 and 2016, a total of 362 geolocators were deployed and 158 recovered from tagging efforts focused on 5 subspecies at 11 breeding sites throughout North America, Finland, and eastern Russia (Figure 6.1). In the summer of 2016 an additional 184 geolocators were deployed at 13 sites including three subspecies that had not been previously tracked. During the summer of 2017, 60 of the 184 were subsequently recovered and an additional 47 were deployed across four sites including the first for the *C. a. kistchinski* subspecies (Figure 6.1). Within Alaska, 6 geolocators were recovered at Kanaryarmiut on the Yukon-Kuskokwim Delta, 3 at the Canning River, and 16 near Point Barrow

(Figure 6.1). Field biologists will continue to capture tagged Dunlin in 2018 as they are relocated. Once these data are available, we will use FLIGHTR and a network model approach to determine patterns of connectivity between nonbreeding regions for 9 of the 10 subspecies of Dunlin. The information from this study is intended to help inform international efforts to develop effective landscape-scale conservation plans for the Dunlin and other sympatric migratory shorebirds throughout the Northern Hemisphere.

This study is focused on the Dunlin, one of the priority shorebird species identified in the Alaska Shorebird Conservation Plan (Alaska Shorebird Group 2008). The study also fulfills action items identified in the Alaska Shorebird Conservation Plan under the Research section (i.e., “develop and implement contemporary research techniques (e.g., geolocators) to identify unique populations of shorebirds that reside in Alaska and to link sites used throughout their annual cycles”), and the International Collaborations section (i.e., “foster cooperative research efforts throughout the Western Hemisphere, Asia, and elsewhere along migratory flyways”, AND “participate in species-specific conservation planning efforts”).

*Locations within Alaska:* Kanaryarmiut, Yukon-Kuskokwim Delta (61.3700°N, 165.1200°W); Canning River, North Slope (70.1180°N, 145.8506°W); Utqiagvik, North Slope (71.2652°N, 156.6359°W)

*Contact:* Ben Lagasse, University of Colorado Denver, Campus Box 171, P.O. Box 173364, Denver, CO 80217; Phone: 774-722-5397; email: Benjamin.Lagasse@ucdenver.edu





## #7— KACHEMAK BAY SHOREBIRD MONITORING PROJECT: 2017 REPORT

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Investigators: George Matz and Kachemak Bay Birders volunteers.

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In May 2017, Kachemak Bay Birders (based in Homer, Alaska) completed its ninth consecutive shorebird monitoring project. The main purpose of this citizen science project is to attain a better understanding of the status of shorebird populations in the Kachemak Bay area, particularly during spring migration. Secondary purposes are: 1) to contribute information that might be useful to others assessing shorebird populations across the entire Pacific Flyway, and 2) to use the monitoring data to help protect Kachemak Bay/Homer Spit shorebird habitat. We continued monitoring at Anchor Point/River and the Kasilof River, which now have five years of data. We had a record number of volunteers this year; a total of 53 with 40 at Homer Spit, 5 at Anchor Point, and 8 at Kasilof River.

Between April 13 and May 23, 2017, we had nine monitoring sessions. We simultaneously monitored five Homer Spit sites and the Anchor River for two hours once every five days when the outgoing tide reached 15.0 feet (or at high tide if less). These tide conditions provide consistency and optimized shorebird viewing conditions. We also recorded any disturbance to shorebirds, which were minimal this year. Monitoring occurred the same day at the Kasilof River and via boat on the south side of Kachemak Bay.

This year at the Homer Spit sites, we observed a total of 22 species of shorebirds and counted a total of 10,413 individual shorebirds. The number of shorebird species counted this year is slightly less than our nine-year average (24). There were no new species. The total number of individual shorebirds counted this year was also slightly less than average (13,130). At the Anchor River, which is about 15 miles north of Homer, we saw a total of 17 species of shorebirds and the total count was 1,819. The five-year average for this site is 18 species of shorebirds with a count of 1,878 shorebirds. At the Kasilof River, about 60 miles north of Homer, we saw 16 species of shorebirds and had a total count of 3,014 shorebirds. The five-year average for this site is 17 species of shorebirds and the average annual count is 7,295 shorebirds. These observations, plus other species of birds seen, were entered in eBird.

Table 7.1 provides a summary of the total count per species for Homer Spit sites over the past nine years. For more detailed information for all sites is in the Kachemak Bay Shorebird Monitoring Project, see our 2017 report which is available at [kachemakbaybirders.org](http://kachemakbaybirders.org).

Table 7.1. Annual shorebird count by species and sorted by average abundance.

| 2009-2017 Kachemak Bay Shorebird Count |                          |       |       |        |        |        |        |       |        |        |         |
|--|--------------------------|-------|-------|--------|--------|--------|--------|-------|--------|--------|---------|
| Sorted by average abundance            |                          |       |       |        |        |        |        |       |        |        |         |
| # of Sp.                               | Species                  | 2009  | 2010  | 2011   | 2012   | 2013   | 2014   | 2015  | 2016   | 2017   | Average |
| 1                                      | Western Sandpiper        | 3,229 | 4,996 | 4,100  | 16,375 | 7,964  | 4,000  | 2,267 | 1,403  | 7,225  | 5,729   |
|  | LESA/WESA/SESA           | 104   | 803   | 3,336  | 844    | 5,305  | 987    | 306   | 6,269  | 360    | 2,035   |
| 2                                      | Red-necked Phalarope     | 1,630 | 1,500 | 5,152  | 1,501  | 703    | 3,006  | 1,503 | 39     | 102    | 1,682   |
| 3                                      | Surfbird                 | 292   | 110   | 574    | 2,919  | 748    | 2,644  | 2,111 | 1,335  | 1,186  | 1,324   |
| 4                                      | Dunlin                   | 1,097 | 561   | 1,283  | 1,205  | 2,548  | 1,530  | 826   | 508    | 590    | 1,128   |
| 5                                      | Semipalmated Plover      | 194   | 203   | 197    | 142    | 92     | 251    | 273   | 270    | 246    | 208     |
| 6                                      | Black-bellied Plover     | 179   | 315   | 282    | 354    | 221    | 114    | 210   | 107    | 80     | 207     |
| 7                                      | Least Sandpiper          | 136   | 245   | 219    | 103    | 128    | 195    | 168   | 245    | 102    | 171     |
| 8                                      | Black Turnstone          | 81    | 373   | 121    | 71     | 21     | 56     | 352   | 55     | 122    | 139     |
| 9                                      | Rock Sandpiper           | 141   | 405   | 482    | 6      | 4      | 6      | 6     | 4      | 47     | 122     |
|  | Dowitcher sp.            | 99    | 82    | 57     | 76     | 344    | 49     | 65    | 17     | 14     | 89      |
| 10                                     | Greater Yellowlegs       | 24    | 36    | 59     | 68     | 90     | 24     | 39    | 44     | 58     | 49      |
| 11                                     | Wandering Tattler        | 13    | 56    | 30     | 18     | 62     | 39     | 39    | 58     | 58     | 41      |
| 12                                     | Short-billed Dowitcher   | 125   | -     | 33     | 76     | 18     | 15     | -     | 20     | 57     | 38      |
| 13                                     | Pacific Golden Plover    | 5     | 42    | 5      | 95     | 96     | 17     | 4     | 23     | 13     | 33      |
| 14                                     | Whimbrel                 | 10    | 22    | 27     | 28     | 65     | 26     | 28    | 43     | 51     | 33      |
| 15                                     | Pectoral Sandpiper       | -     | 7     | -      | 1      | 146    | 98     | 11    | -      | 15     | 31      |
| 16                                     | Long-billed Dowitcher    | -     | -     | 15     | 1      | 22     | 36     | -     | 1      | 37     | 12      |
| 17                                     | Semipalmated Sandpiper   | 1     | 5     | 3      | 34     | -      | 13     | 33    | 3      | 10     | 11      |
| 18                                     | Black Oystercatcher      | 11    | 11    | 13     | 8      | 2      | 8      | 18    | 15     | -      | 10      |
| 19                                     | Lesser Yellowlegs        | -     | 26    | 3      | 15     | 9      | 4      | 11    | 1      | 5      | 8       |
| 20                                     | Marbled Godwit           | 3     | 12    | 1      | 7      | -      | 8      | 5     | 5      | 11     | 6       |
| 21                                     | Ruddy Turnstone          | 1     | 10    | 1      | 2      | 9      | 2      | 6     | 9      | 7      | 5       |
|  | Yellowlegs sp.           | 2     | 18    | -      | 2      | 2      | -      | 5     | -      | 15     | 5       |
| 22                                     | Hudsonian Godwit         | 18    | -     | 2      | -      | 3      | 3      | -     | -      | 1      | 3       |
| 23                                     | Sanderling               | -     | 1     | 8      | 8      | -      | 2      | -     | -      | -      | 2       |
| 24                                     | American Golden-Plover   | 3     | 1     | 1      | 1      | 10     | -      | -     | -      | -      | 2       |
| 25                                     | Bar-tailed Godwit        | 3     | -     | -      | 4      | 6      | -      | -     | 1      | 1      | 2       |
| 26                                     | Wilson's Snipe           | 1     | 5     | 1      | 1      | -      | -      | -     | -      | -      | 1       |
| 27                                     | Baird's Sandpiper        | 1     | -     | -      | 6      | -      | -      | -     | 1      | -      | 1       |
| 28                                     | Bristle-thighed Curlew   | -     | -     | -      | -      | 5      | -      | -     | -      | -      | 1       |
| 29                                     | Red Phalarope            | -     | -     | -      | -      | -      | 5      | -     | -      | -      | 1       |
| 30                                     | Spotted Sandpiper        | 3     | -     | -      | 1      | -      | -      | -     | 1      | -      | 1       |
| 31                                     | Red Knot                 | -     | -     | 2      | -      | -      | 1      | 1     | -      | -      | 0       |
|  | <b>Total Individuals</b> | 7,406 | 9,845 | 16,007 | 23,972 | 18,623 | 13,139 | 8,287 | 10,477 | 10,413 | 13,130  |
|  | <b>Total Species</b>     | 24    | 23    | 25     | 27     | 23     | 25     | 21    | 23     | 22     | 24      |

The most significant event this year was the large pulse of sandpipers (mostly Western Sandpipers and Dunlin) that briefly stopped-over at the Homer Spit on May 10. There was a report of 150,000 Western Sandpipers and 6,000 Dunlin spread over about 1.4 miles of the Homer Spit intertidal area (see Figures 7.1 and 7.2; photos by Laura and Toby Burke). The arrival of this pulse coincided with perfect weather conditions for migrating birds. A strong low pressure stalled over the Gulf of Alaska resulting in counterclockwise winds across Southeast Alaska that turned west around Yakutat and then southwest to the Copper River Delta and then Kachemak Bay, much like the pattern of the Pacific Flyway. This pulse was considerably larger than any Kachemak Bay report over the past decade. However, some of the first Kachemak Bay shorebird monitoring surveys three decades ago had similar observations. Unfortunately, the peak of this pulse did not occur on a scheduled monitoring day, but the first and last day of the pulse did. However, because a significant number of migrating shorebirds may arrive and leave between monitoring days, and thereby not be included in our count, we also use eBird reports to

provide supplemental data to fill in the gaps. This gives us a more accurate assessment of the total number of shorebirds that stopover at Kachemak Bay during spring migration. More details are in the 2017 report.



*Figure 7.1.* Shorebirds on a portion of Mud Bay.



*Figure 7.2.* Illustrating the density of shorebirds.

Every year, we compare our count to the eight years of monitoring done by the late George West in 1986 and 1989\_1994. Adjustments are needed to account for West having a daily count and not at all the same sites we now do. Figure 7.3 provides a long-term perspective of shorebird populations that stopover at Homer Spit sites during spring migration. Our current shorebird counts are about 55% of what West observed.

*Location:* Kachemak Bay, Alaska.

*Contact:* George Matz, Kachemak Bay Birders, Homer, AK. [geomatz@alaska.net](mailto:geomatz@alaska.net), (907) 235-9344.

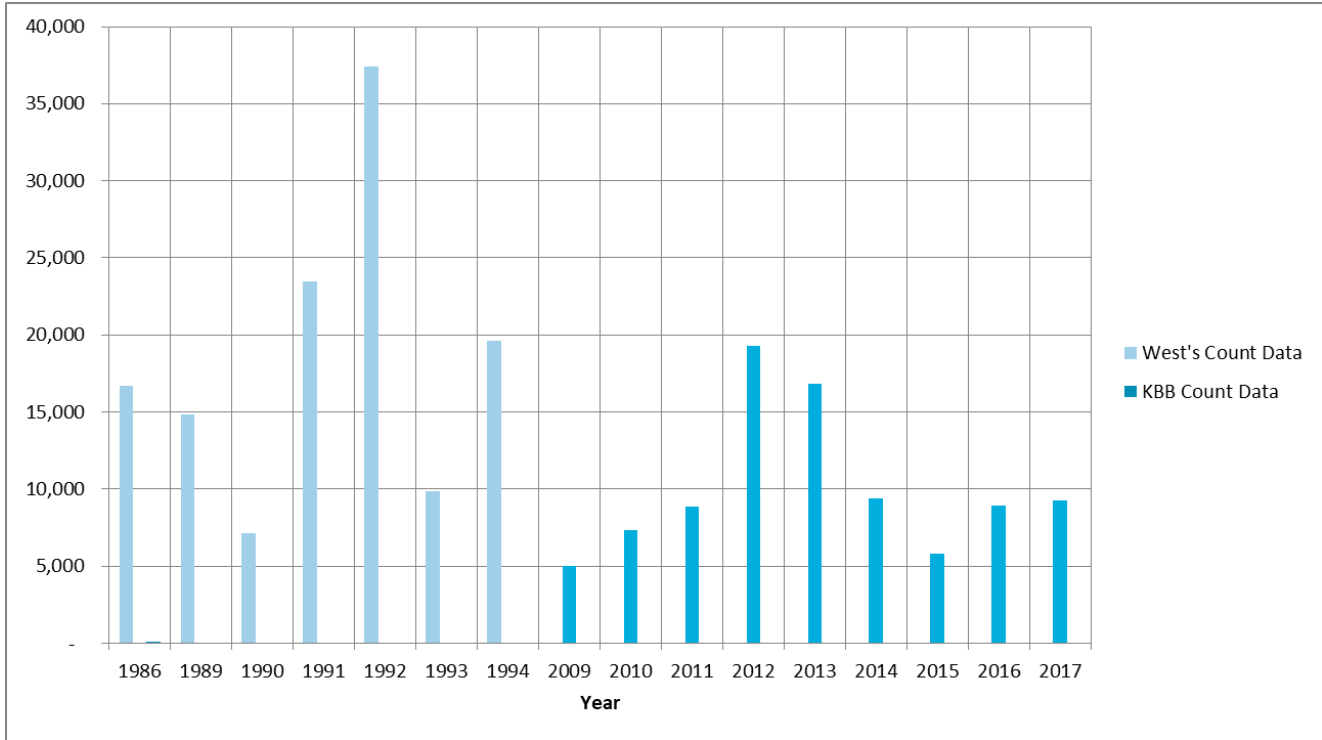


Figure 7.3. Total shorebird counts by year for the Homer Spit



## #8— LONG-TERM MONITORING OF BLACK OYSTERCATCHERS IN THE GULF OF ALASKA

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Investigators: Brian Robinson and Daniel Esler, U.S. Geological Survey; Heather Coletti,  
National Park Service

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The Gulf Watch Alaska nearshore program monitors ecologically important species and key physical parameters in the nearshore marine environment. These species include sea ducks, sea otters, intertidal invertebrates, and Black Oystercatchers. Monitoring of Black Oystercatchers began in 2006 and is done yearly in three areas: Katmai National Park and Preserve, Kenai Fjords National Park, and western Prince William Sound. In each area, surveys are conducted along five 20-km transects to determine nest density, productivity, and chick diet. We estimate species composition and size distributions of prey fed to chicks by collecting and measuring all prey remains found near a nest, indicative of adults provisioning their offspring. Here we present preliminary results.

In 2017, we located a total of 27 nests in all three areas. Nest density this year ranged from 0.03 to 0.07 nests per km of shoreline, with the highest density in Katmai National Park and Preserve. Productivity (number of eggs/chicks) was highest ( $1.80 \pm 0.49$ ; mean  $\pm$  SE) in western Prince William Sound and lowest ( $0.87 \pm 0.53$ ) in Kenai Fjords National Park. Although highly variable in all three areas, nest density appears to be similar across the 11 years of sampling, with little evidence of a trend. We collected 661 prey items from nests in 2017, representing 11 different species. While chick diet varied by area and transect, overall it was dominated by three species of limpets (*Lottia pelta*, *L. persona*, and *L. scutum*) and Pacific blue mussels (*Mytilus trossulus*); together these species made up 86% of the diet in 2017 and have dominated chick diet throughout the 11 years of sampling. In 2018, we will expand our efforts to include Kachemak Bay. Long-term monitoring of Black Oystercatchers provides an opportunity to understand how a top-level predator in the intertidal food web may respond to changes in a highly dynamic ecosystem.

*Location:* Katmai National Park and Preserve, Kenai Fjords National Park, and Prince William Sound.

*Contact:* Brian Robinson, Alaska Science Center, U.S. Geological Survey, 4210 University Drive,  
brobinson@usgs.gov, 907-786-7058



Figure 8.1. The Black Oystercatcher is one of many ecologically important species in the nearshore marine ecosystem that is monitored by Gulf Watch Alaska.



*Figure 8.2.* Black Oystercatcher defending its chicks in Katmai National Park and Preserve. Photo: Brian Robinson.

## #9— POTENTIAL CLIMATE-MEDIATED IMPACTS ON THE REPRODUCTIVE OUTPUT OF SHOREBIRDS AT THE COLVILLE RIVER, ALASKA

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Investigators: Dan Ruthrauff and Vijay Patil, US Geological Survey.

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2017 marked the sixth year of monitoring the reproductive output of shorebirds at the Colville River Delta (70.437°N, 150.677°W) under the Alaska Science Center's Changing Arctic Ecosystems initiative. We monitored the seasonal timing and outcomes of reproductive events of the nine most-common species of shorebirds at the site, and documented seasonal trends of their invertebrate prey resources following Arctic Shorebird Demographic Network protocols. In contrast to many of the preceding years, spring phenology was considerably delayed in 2017 due to unusually cold temperatures and persistent snow cover. We arrived at the site on 21 May to mild, sunny weather, but average daily temperatures during the first 3 weeks of June were 2–10° C colder than the long-term mean. This period of unusual cold overlapped with the period during which most shorebirds were attempting to establish nest sites and lay eggs, and caused significant impacts to the shorebird community at our site.

Over the previous six years of study, the mean date of nest initiation across all species was 10 June, but nests were delayed by about four days in 2017. Additionally, we found and monitored >50% fewer nests in 2017 than in the previous two years. We monitored 109 shorebird nests in 2017 compared to 259 and 242 in 2015 and 2016, respectively. All shorebird species were impacted by the cold; most nested in much lower numbers, but some apparently did not attempt to breed. For instance, we typically monitor 8–10 Ruddy Turnstones nests each year, but this year we found only one nest, and it contained only one egg. Despite the cold spring, temperatures returned to normal during the third week of June, and those shorebirds that managed to initiate nests generally experienced a high abundance of arthropods during the chick-rearing period. As in the previous two years, we monitored chicks of Semipalmated Sandpipers, but due to lower numbers of nests we monitored only 29 broods, compared to ~75 broods in both 2015 and 2016. Having fewer chicks to monitor made it more difficult to obtain repeated measures of chick growth, but our limited recaptures and the high abundance of arthropods in our invertebrate traps indicated that conditions were favorable for chicks. Thus, despite severe impacts to the timing and overall number of shorebirds nesting at the Colville River in 2017, it appears that those individuals that did manage to successfully hatch their eggs likely experienced good conditions for raising chicks. In contrast to 2015 when unusually cold weather in mid-July negatively affected chick growth, weather conditions were mild across most of the brood-rearing period. These studies relate to conservation issues identified for BCR 3 in the Alaska Shorebird Conservation Plan relating to Energy Production and Mining as well as Climate Change and Severe Weather. This year concluded our study of the growth of Semipalmated Sandpiper chicks in relation to the timing and abundance of their insect prey.

*Location:* Colville River, Alaska

*Contact:* Dan Ruthrauff: druthrauff@usgs.gov



## #10— SHOREBIRD MONITORING ON THE YUKON DELTA NATIONAL WILDLIFE REFUGE, 2016–17

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Investigators: Stephen Brown and Brad Winn, Manomet Center for Conservation Sciences; Brad Andres, Diane Granfors, Jim Johnson, Richard Lanctot, and Sarah Saalfeld, U.S. Fish and Wildlife Service; Jim Lyons, USGS; Kristine Sowl and Brian McCaffery, Yukon Delta National Wildlife Refuge

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The Program for Regional and International Shorebird Monitoring (PRISM) is a broad-scale effort to estimate size, trend, and distribution of North American shorebird populations. Since the late 1990s, PRISM surveys have been completed across much of Arctic Alaska and Canada. However, there has been one major and important gap in the data from these surveys. Except for a 853-km<sup>2</sup> portion of the central coast, the majority of the approximately 95,000-km<sup>2</sup> Yukon-Kuskokwim Delta (Delta) had not been surveyed. The Delta encompasses about 75% of Alaska's coastal wetlands and hosts a large proportion of the breeding grounds of many North American shorebird species as well as a unique Beringian breeding component. Accurate continental population sizes and trends cannot be estimated without completing surveys in this region. In 2016, we completed a second year of breeding shorebird surveys across the Delta. In addition, we conducted intensive nest searching on plots at two sites to determine actual nesting densities. Rapid surveys were conducted on these intensive plots to determine detection rates that could be used to correct counts on a large number of other rapid plots selected rapidly throughout the Delta. A second year of intensive nest searching was conducted at one of the sites in 2017 to confirm nesting densities.

Rapid survey plots, 16-ha in size, 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 non-suitable habitat, such as forested areas. Plots were divided amongst three survey teams that consisted of four observers each. Three members of each team were transported to survey plots by R44 helicopter, while the fourth team member conducted rapid surveys of intensive plots. During rapid surveys, a single observer walked a plot for 1 hour and 36 minutes, mapping all shorebird observations and recording their behaviors. At the end of the survey, the observer tallied the number of breeding pairs and total number of individual birds. Other species of birds observed during surveys were noted as present on the data form.

A total of 321 rapid plots were surveyed 15–26 May 2016. The surveys documented 8,114 individuals of 25 species. The most numerous were Red-necked Phalarope (28% of birds observed), Western Sandpiper (17%), Dunlin (15%), Pectoral Sandpiper (8%), Long-billed Dowitcher (8%), Black Turnstone (4%), Bar-tailed Godwit (4%), and Wilson's Snipe (4%). As expected, there appears to be a strong coastal density gradient with the highest densities of shorebirds occurring within a few kilometers of the coast. Data from the surveys should help clarify the distributions of several species on the Delta, such as Short-billed and Long-billed Dowitchers, Greater and Lesser Yellowlegs, and American and Pacific Golden-Plovers. Unfortunately, the surveys may not be adequate for documenting the breeding

distribution of several other species. For example, Pectoral Sandpipers are known to be an uncommon or rare breeder on the Delta. But they have a propensity to display during migration, making it difficult to classify any given bird as migrant or breeder. The phalaropes are also problematic since they are essentially non-territorial, which presents some difficulties in estimating the actual numbers of breeding pairs.

Intensive plots were established in two non-randomly chosen locations, and had four plots per site, in 2016. The sites were chosen as likely sites for breeding Dunlin (*pacifica* subspecies) and Western Sandpiper, as these were common species for which we wanted detection ratios. During intensive surveys, another crew searched plots for four hours per day throughout the nesting period in an effort to find all nests. Each rapid survey crew member (see above) conducted blind surveys of four intensive plots. Data on the suspected (based on intensive surveys) and estimated (based on rapid surveys) number of birds nesting on the plots will be compared to develop detection ratios. The northern plots were established at a site called “Boot Lake,” in the northern portion of the Delta. Unfortunately, it proved to be low density shorebird nesting habitat and only 15 nests of two species (Western Sandpiper and Red-necked Phalarope) were found. Intensive plots were also established at Kanaryarmiut Field Station in the central Delta, a known high-density nesting area. In 2016, a total of 111 nests of nine species were found on the four intensive plots at this site. The nest of a tenth species (Ruddy Turnstone) was found just outside of a plot. The common breeders included Western Sandpipers ( $n = 50$ ), Red-necked Phalaropes ( $n = 31$ ), and Dunlin ( $n = 19$ ). Although rapid surveys were not conducted at intensive plots in 2017, the four intensive plots located at Kanaryarmiut Field Station were surveyed for a second year. In 2017, a total of 139 nests of six species were found on the four plots at this site. The nest of a seventh species (Rock Sandpiper) was found just outside of a plot. Once again, the common breeders included Western Sandpipers ( $n = 52$ ), Red-necked Phalaropes ( $n = 62$ ), and Dunlin ( $n = 21$ ). Numbers of nests were similar between years for Western Sandpipers and Dunlin, but twice as many Red-necked Phalarope nests were found in 2017 as in 2016.

This was the final year for the PRISM survey work conducted at Yukon Delta National Wildlife Refuge (YDNWR). The project was a huge cooperative effort. Partners included YDNWR, 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), and the USFWS Refuge Inventory and Monitoring Program.

This study fulfills two of the primary conservation objectives for Bird Conservation Region 2 as outlined in the Alaska Shorebird Conservation Plan (2008), which are to “determine better estimates of population status and investigate causes of shorebird population declines” and “implement long-term population monitoring programs for priority species, including Bristle-thighed Curlew, Hudsonian Godwit, Marbled Godwit, Bar-tailed Godwit, and Black Turnstone.”

*Location:* Yukon Delta National Wildlife Refuge

*Contact:* Kristine Sowl, Wildlife Biologist (Non-game), Yukon Delta National Wildlife Refuge, PO Box 346, Bethel, AK 99559. Phone: 907-543-1015; email: kristine\_sowl@fws.gov.



*Figure 10.1.* Rock Sandpiper nest. Kanaryarmiut, 06-25-2017. Photo Credit: Kristine Sowl.

## #11— MONITORING HUDSONIAN GODWITS AT BELUGA RIVER

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Investigators: Rose J Swift, Cornell Lab of Ornithology, Cornell University; Amanda D Rodewald, Cornell Lab of Ornithology, Cornell University; Nathan R Senner, University of Montana, Missoula

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In an effort to identify the potential causes underlying population declines, we again monitored Hudsonian Godwits (*Limosa haemastica*) at Beluga River, Alaska, in 2017. While research on the relative influence of within breeding season vs. non-breeding season factors on reproductive performance wrapped up in 2016, our efforts focused on two main goals: **(1)** Continue monitoring fluctuations in adult survival in order to develop a full annual cycle population model that can be used to pinpoint the season(s) during which adult godwits are experiencing the highest mortality rates and thus, likely, in need of the most conservation attention; **(2)** Continue monitoring the relationship between godwit reproductive efforts and local insect phenology, as the survival of godwit young has decreased over the past seven years, potentially reflecting a recent shift in the local climate change regime that may be causing them to become mismatched with their main food resources.

In addition, three manuscripts highlighting work at Beluga River with Hudsonian Godwits were published this past year:

Rose J. Swift, Amanda D. Rodewald, and Nathan R. Senner. 2017. Environmental heterogeneity and biotic interactions as potential drivers of spatial patterning of shorebird nests. *Landscape Ecology* 32(8):1689–1703.

Rose J. Swift, Amanda D. Rodewald, and Nathan R. Senner. 2017. Breeding habitat of a declining shorebird in a changing environment. *Polar Biology* 40(9):1777–1786.

Nathan R. Senner, Maria Stager, and Brett K. Sandercock. 2017. Ecological mismatches are moderated by local conditions for two populations of a long-distance migratory bird. *Oikos* 126:61–72.

*Location:* Beluga River, Cook Inlet, 61.161728°N, 151.056379°W

*Contact:* Rose Swift, Cornell Lab of Ornithology, 159 Sapsucker Woods Rd, Ithaca, NY 14850; email: rjs484@cornell.edu



## #12— CHARACTERIZING ARCTIC SHOREBIRD CHICK DIETS: PROVIDING INSIGHTS INTO TROPHIC MISMATCH WITH DNA BARCODING AND NEXT-GENERATION SEQUENCING

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Investigators: Danielle Gerik, University of Alaska Fairbanks; Richard Lanctot & Sarah Saalfeld, U.S. Fish and Wildlife Service; Kirsty E. Gurney, Environment Canada; and Andrés López, University of Alaska Fairbanks

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Climate-driven shifts in the phenology and availability of arthropod prey for nesting adult shorebirds and their young may have both short-term and long-term implications for shorebirds nesting in the Arctic. The advancement of spring is shifting temperature-dependent pulses of arthropod emergence. Should shorebirds be unable to adjust their phenology at the same rate as arthropods (resulting in a trophic mismatch), these changes may result in reduced growth and survival of shorebird young. Determining chick diet through development is important for understanding whether and how chicks adjust their diet with changes in the emergence of arthropods.

We used DNA metabarcoding to characterize the diets of pre-fledged Red Phalarope (*Phalaropus fulicarius*), Pectoral Sandpiper (*Calidris melanotos*), and Dunlin (*Calidris alpina*) at Utqiagvik (formerly Barrow), Alaska, from June to July 2014–2015. A reference library of invertebrate taxa was collected at Utqiagvik and DNA barcodes were developed to represent their genetic signatures. Prey DNA obtained from feces of chicks 1 to 15 days old were identified through alignment with this reference library, in addition to ‘barcodes’ obtained from the Barcode of Life, to determine arthropod taxa eaten by chicks. Taxonomic classification was assigned using a match of 98% between DNA query and barcode reference. For those operational taxonomic units that could not be assigned to an arthropod species, we used a Bayesian phylogeny-based inference approach to classify prey taxonomically.

Preliminary DNA metabarcoding results of chick diets (combined for the three species of shorebird young) revealed surprising diversity with 62 arthropod prey species representing 3 classes, 6 orders, 23 families, and 41 genera. By proportion of occurrence, 23% of chick feces contained Chironomidae, 16% Muscidae, 12% Carabidae, 8% Linyphiidae, 7% Cecidomyiidae, and 5% Culicidae, while the remaining families were detected in less than 5% of feces. Of the prey families detected, 13 were novel, and had not been described in the diets of these shorebird species through gut content analyses carried out in Utqiagvik in the 1960s. The major orders found in the highest proportion of occurrence (Diptera, Coleoptera, and Araneae) were found through both gut content analyses and molecular approaches.

We monitored the availability of arthropods in mesic and dry habitats near chick-rearing areas at Utqiagvik by deploying ‘malaise’ pitfall traps during the same study period each year. We found that the composition of the arthropods in the environment generally reflected prey found in chick diets based on DNA barcoding. However not all arthropod families detected in chick diets were found in arthropod traps and vice versa. Work is ongoing to assess how timing and abundance of these prey measured through environmental sampling relates to chick diet composition.

Additionally, we evaluated the efficacy of the gene sequence-based technique to recover prey DNA from shorebird feces by conducting a captive feeding study during the summer of 2015 with pre-fledged Pectoral Sandpipers and Red Phalarope. Chicks were experimentally fed arthropods (Chironomidae, Coleoptera, Brachycera, Plecoptera, Culicidae, Trichoptera) and their subsequent feces were systematically collected over a 70-minute period. On-going analyses of these feces will allow us to assess how technical and biological factors (chick age, prey type, prey size, and PCR amplification efficiency) affect the recovery of prey DNA. Preliminary results suggest that prey detection may vary by prey type and mitochondrial marker (CO1 and 16s). Combined coverage by two markers enhanced the overall recovery of prey DNA in feces. In addition, we measured the size of prey eaten by captive chicks as they matured. Prey size is frequently ignored when determining prey available to chicks through environmental sampling. This study fulfills one primary objective for Bird Conservation Region 3 to “develop models to predict the effects of long-term climate change on shorebird populations,” as outlined in the Alaska Shorebird Conservation Plan (2008).

Thanks goes out to the volunteers, technicians and collaborators on this project. Funding was provided by the Arctic Landscape Conservation Cooperative, Arctic Audubon Society, U.S. Geological Survey, the National Fish and Wildlife Foundation, and the U.S. Fish and Wildlife Service.

*Location:* Utqiagvik (formerly Barrow), North Slope, 71° 17'N, 156° 47'W

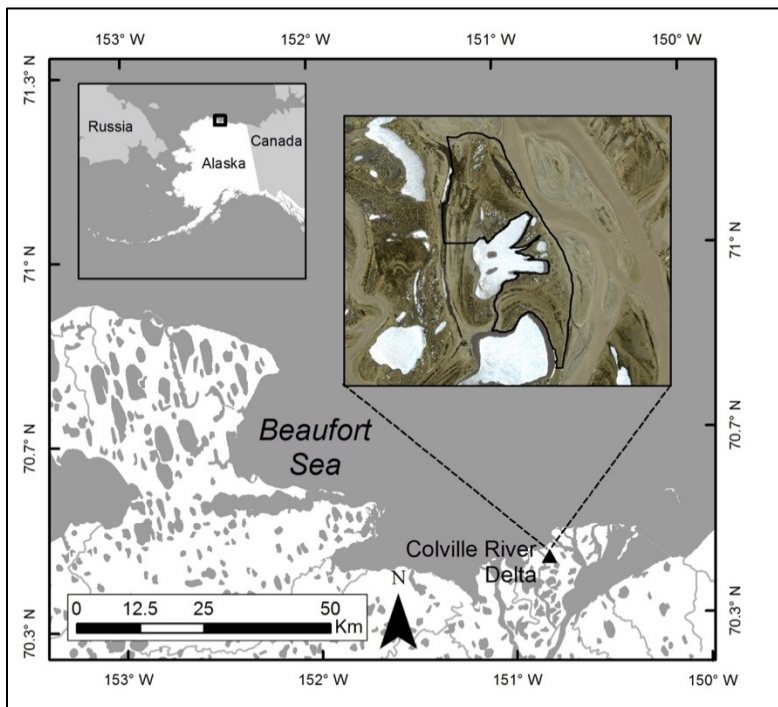
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## #13— THE INTERACTIVE EFFECTS OF TEMPERATURE AND ORGANIC CONTAMINANTS ON EMBRYO DEVELOPMENT IN SHOREBIRDS

Investigators: Ella Lunny, Kirsty Gurney, Dan Ruthrauff

Suboptimal incubation temperature and environmental contaminants can both affect avian development *in ovo*, and the combination of these stressors may have more detrimental effects than either stressor individually. For example, incubation temperature can influence physiological processes, and thus may affect the rate at which contaminants are absorbed and subsequent effects on the developing embryo. Yet, to our knowledge, no avian ecotoxicological studies have evaluated the relationship between incubation temperature and contaminants in eggs. This type of interaction could especially be a concern for avian species breeding in the Arctic, where embryo development is incredibly temperature-sensitive. Shorebirds are the dominant avian fauna in many Arctic systems and can be exposed to elevated organic contaminant concentrations when foraging in wetlands and estuaries. Therefore, these birds are ideal models to test hypotheses related to the interactive effects of incubation temperature and contaminant exposure. Specifically, our field-based research will focus on Semipalmated Sandpipers (*Calidris pusilla*) breeding at the Colville River Delta (Figure 13.1), where we will evaluate organic contaminant levels of shorebirds eggs and investigate linkages between organic contaminants, incubation duration, and chick mass at hatch. This research addresses the issue regarding environmental pollution in the 2008 Alaska Shorebird Conservation Plan.

*Location:* Colville River site, Alaska (70°42'N, 150°68'W) (Figure 1.1).



*Figure 13.1.* The Colville River Delta is used by many shorebirds, including Semipalmated Sandpipers, during breeding and migration.

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## #14— SHOREBIRD USE AND ABUNDANCE ON MILITARY LANDS IN INTERIOR ALASKA

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Investigators: Ellen Martin, Colorado State University; Paul F. Doherty, Jr, Colorado State University; Kim Jochum, Center for Environmental Management of Military Lands; Calvin Bagley, Center for Environmental Management of Military Lands

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The boreal forest in interior Alaska is difficult to access and remote. Few studies have been conducted on shorebird status and trends, and little evidence exists documenting shorebird presence, areas of use, or abundance in interior Alaska (Bird Conservation Region [BCR] 4). We implemented a design-based survey of shorebird habitat use in interior Alaska. This study used a modified Arctic PRISM protocol to determine shorebird habitat relationships in the interior boreal forest of Alaska, specifically on military lands on Tanana Flats Training Area and Donnelly Training Area in Fairbanks and Delta Junction, Alaska, respectively (Figure 14.1). Over 450,000 hectares of land in interior Alaska are managed by the Department of Defense and are composed of a vast boreal forest, where shorebird densities are believed to be low. Although densities are predicted to be low, this area is so large that we hypothesize it may be an important breeding area for nesting shorebirds. From 2016 to 2018, we conducted plot surveys to meet three objectives: (1) Identify shorebird species using military lands in interior Alaska (BCR 4), (2) create occupancy/habitat use models for these species and test hypotheses about species-specific covariate relationships (e.g., elevation, shrub height, distance to water), and (3) estimate shorebird abundance for species of conservation concern in Alaska.

We surveyed 78 plots in 2016 and 142 plots in 2017 twice on both training areas (Figure 14.2). On these plots, we conducted habitat surveys and presence/absence surveys for all species of shorebirds. We found 12 of 14 hypothesized species of shorebirds on plot, both lowland and upland (Table 14.1). Several of the species found are of high conservation concern as listed by the USFWS and the Alaska Shorebird Conservation Plan. From these raw data, we tested a series of occupancy models (MacKenzie et al. 2006) to estimate habitat use and used AIC<sub>c</sub> values for model selection and ranking (Burnham and Anderson 2003). The top model had distance to wetland and elevation as the strongest covariate predictors of occupancy.

Ultimately, we can use this information to provide the military with maps of high probability use areas by shorebirds during the breeding season. From these, we can overlap proposed development or training activities with areas of high probability of shorebird occupancy and make management recommendations to the military about location and timing of activities. The next step is to calculate abundance estimates for species found on plot during surveys and expand occupancy analysis.

*Location:* Tanana Flats Training Area and Donnelly Training Area, Fairbanks and Delta Junction, Alaska (Figures 14.1. and 14.2).



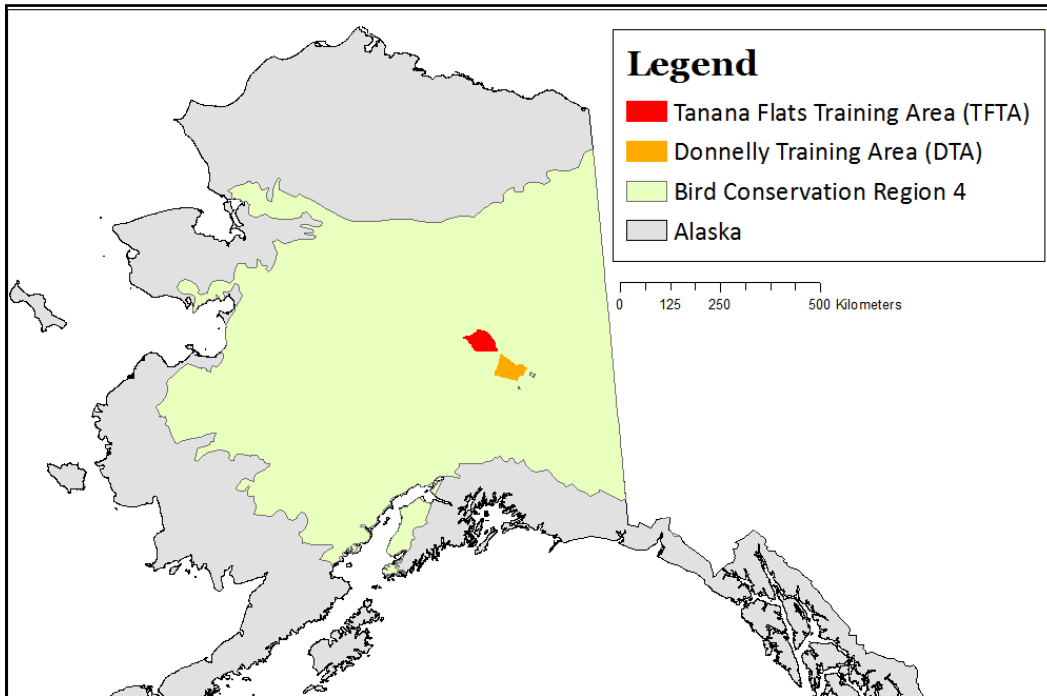


Figure 14.1: Study areas in interior Alaska, Bird Conservation Region 4.

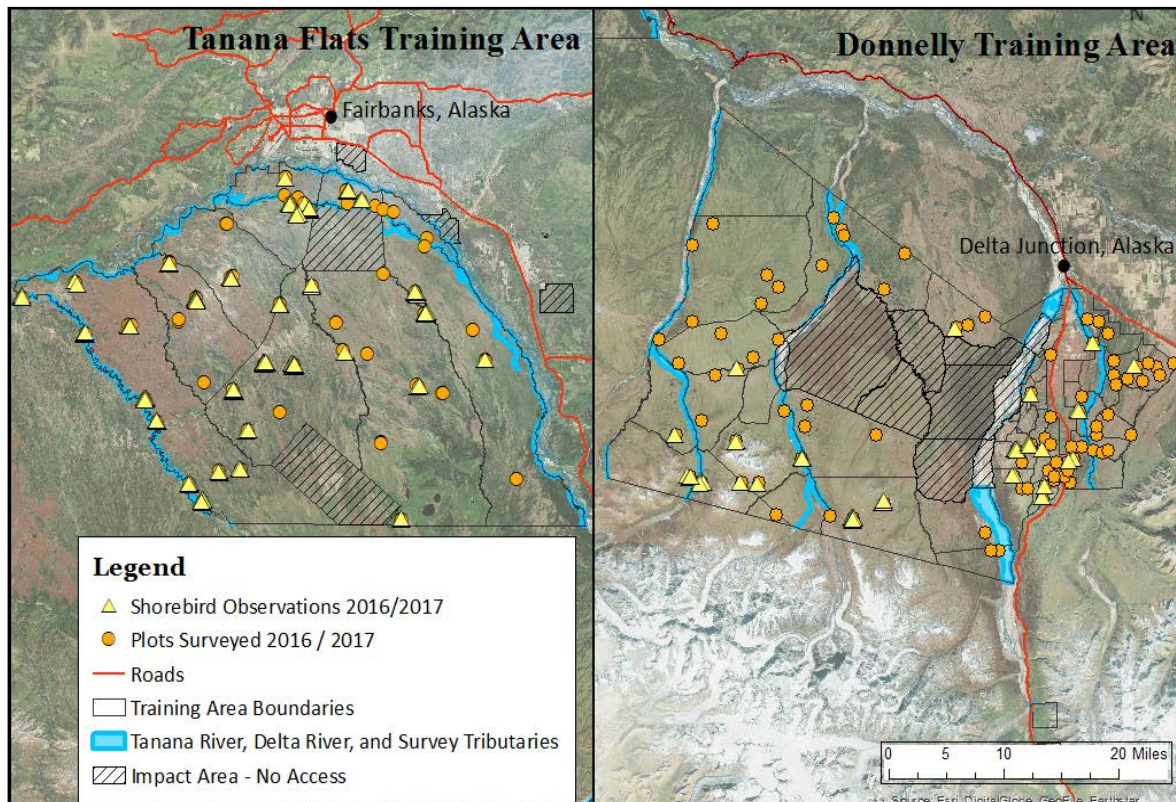


Figure 14.2. All shorebirds observed on plots surveyed during 2016 and 2017 shorebird surveys.

Table 14.1: Shorebird raw counts and their conservation status.

| Species  | Upland<br>vs<br>Lowland | 2016<br>Count | 2017<br>Count | AK Shorebird<br>Cons. Plan<br>(High Concern List) | USFWS<br>(High Concern List) |
|--|-------------------------|---------------|---------------|---|------------------------------|
| Lesser Yellowlegs ( <i>Tringa flavipes</i> )         | Lowland                 | 43            | 144           | ✓   | ✓                            |
| Wilson's Snipe ( <i>Gallinago delicata</i> )         | Lowland                 | 41            | 153           |   |                              |
| Spotted Sandpiper ( <i>Actitis macularius</i> )      | Lowland                 | 10            | 21            |   |                              |
| Solitary Sandpiper ( <i>Tringa solitaria</i> )       | Lowland                 | 4             | 5             | ✓   | ✓                            |
| Dunlin ( <i>Calidris alpina</i> )                    | Lowland                 | 1             | 0             | ✓   |                              |
| Least Sandpiper ( <i>Calidris minutilla</i> )        | Lowland                 | 0             | 1             |   |                              |
| Whimbrel ( <i>Numenius phaeopus</i> )                | Upland                  | 5             | 11            | ✓   | ✓                            |
| Black-bellied Plover ( <i>Pluvialis squatarola</i> ) | Upland                  | 2             | 3             |   |                              |
| Upland Sandpiper ( <i>Bartramia longicauda</i> )     | Upland                  | 1             | 3             | ✓   | ✓                            |
| American Golden-Plover ( <i>Pluvialis dominica</i> ) | Upland                  | 0             | 1             | ✓   |                              |
| Baird's Sandpiper ( <i>Calidris bairdii</i> )        | Upland                  | 0             | 1             |   |                              |
| Pectoral Sandpiper ( <i>Calidris melanotos</i> )     | Upland                  | 0             | 1             |   |                              |
| Total  | --                      | 120           | 364           |   |                              |

*Contact(s):*

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## #15— POST-BREEDING MOVEMENTS AND HABITAT USE OF SHOREBIRDS ON ALASKA’S NORTH SLOPE

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Investigators: Richard Lanctot, U.S. Fish and Wildlife Service; Stephen Brown, Manomet, Inc.; Sarah Saalfeld, U. S. Fish and Wildlife Service; Rebecca Bentzen, Wildlife Conservation Society; Christopher Latty, U.S. Fish and Wildlife Service; and Daniel Ruthrauff, U.S. Geological Society

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To better understand shorebird post-breeding movements and habitat use along the Arctic Coast, we initiated a multi-year GPS tracking project in 2017. This study will provide essential baseline information on shorebird use of coastal regions and contribute to understanding how climate-mediated and development-related habitat change is likely to affect shorebirds. Because we do not currently know basic information on the inter-connectedness of breeding and stopover sites, as well as residency time and movements among stopover sites, it is difficult to know what resources are at risk, and therefore what mediation responses to recommend.

During the 2017 field season we deployed 1.2-g GPS PinPoint-10 tags manufactured by Lotek Wireless on 57 Dunlin and 68 Semipalmated Sandpipers at four breeding sites along the Arctic Coastal Plain of Alaska (Utqiagvik, Colville River, Prudhoe Bay, and Canning River). These tags will collect GPS-quality location data primarily during the post-breeding season (June–October) but also throughout the southbound migration and wintering period at less intensity. We will retrieve tags from birds when they are recaptured during the 2018 nesting season. For each tagged individual, we also collected information on nest survival rates that will allow us to compare productivity rates in relation to migration patterns. Additionally, we collected feather and blood samples for each tagged individual, allowing us to genetically sex birds, and in a future study, assess stress levels from winter-grown feathers that can be related to migration patterns and productivity. We plan to expand this work in 2018 to monitor post-breeding movements and habitat use of female Pectoral Sandpipers, male and female American Golden-Plovers, and male Red Phalarope breeding at these same sites in Arctic Alaska.

This study fulfills action items identified in the Alaska Shorebird Conservation Plan under the Research section (i.e., “develop and implement contemporary research techniques to identify unique populations of shorebirds that reside in Alaska and to link sites used throughout their annual cycles”) and the Habitat Management and Protection section (i.e., “identify important shorebird habitats throughout the state”).

Field assistance for conducting this work was provided by Ben Lagassé, Sarah Hoepfner, and Lindall Kidd at Barrow; Kim Alexander, Nick Caswell, and Micaela Snyder at the Colville River Delta; Peter Detwiler and Devon Short at Prudhoe Bay; and Shiloh Schulte, Alan Kneidel, Alex Lamoreaux, Metta McGarvey, Elyssa Watford and Wilhelm Wiese at the Canning River. Funding or logistical support for this study was provided by the National Fish and Wildlife Foundation, Manomet, Inc., U.S. Fish and Wildlife Service, Wildlife Conservation Society, U.S. Geological Survey, and BP Exploration (Alaska), Inc.

*Location:* Cross-Arctic project with multiple study sites located at Utqiagvik, Colville River, Prudhoe Bay, and Canning River

*Contact(s):* Richard Lanctot, Shorebird Coordinator, U.S. Fish and Wildlife Service, 1011 East Tudor Road, MS 201, Anchorage, AK 99503, Email: richard\_lanctot@fws.gov, Phone: 907-786-3609



## #16— REPRODUCTIVE ECOLOGY OF SHOREBIRDS: STUDIES AT UTQIAGVIK (FORMERLY BARROW), ALASKA, IN 2017

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Investigators: Richard Lanctot, U.S. Fish and Wildlife Service; Sarah Saalfeld, U. S. Fish and Wildlife Service

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In 2017, we conducted the 15th year of a long-term shorebird study at Utqiagvik (formerly Barrow), Alaska (71.29°N, 156.64°W). The objectives of this study are to (1) collect baseline data on temporal and spatial variability of shorebird diversity and abundance, (2) collect information on nest initiation and effort, replacement clutch laying, clutch and egg size, nest and chick survival, and other demographic traits of Arctic-breeding shorebirds, (3) establish a marked population of as many shorebird species as possible that will allow us to estimate adult survival, mate and site fidelity, and natal philopatry, and (4) relate weather, food availability, and predator and prey abundances to shorebird productivity and survival.

The summer of 2017 had one of the latest snow melts recorded in the past 15 years, with 20% snow cover remaining on the tundra until 17 June (average long-term date is 10 June and only 2010 had as late of conditions). Lemming numbers in 2017 were lower than the previous few years, and far below that experienced in 2006–2008. Despite the lack of lemmings, avian predator densities were still fairly high. Arctic foxes were also fairly common, as fox removal to help the threatened Steller's Eider was not continued in 2017.

We located and monitored nests in six 36-ha plots in 2017. All six plots were the same as those sampled in 2016, with five of the six plots sampled since 2005; all plots were searched with the same intensity as in past years. A total of 237 nests were located on plots and an additional 52 nests were found outside the plot boundaries. Our total number of nests located on plots was lower than the past six years (i.e., 2011–2016 where number of nests ranged from 337–506), but generally higher than the first eight years of this study (i.e., 2003–2010; only 2006 had more nests with 318 nests located; all other years had 75–233 nests located). Nests on plots included 97 Red Phalarope, 41 Pectoral Sandpiper, 32 Dunlin, 22 Semipalmated Sandpiper, 15 Western Sandpiper, 10 Long-billed Dowitcher, 10 Red-necked Phalarope, and 10 American Golden-plover. No Ruddy Turnstone, White-rumped, Baird's, or Buff-breasted sandpiper nests were found on the plots in 2017. The breeding density of all shorebird species on our study area was 109.7 nests/km<sup>2</sup>; this was less than our long-term average of 129.2 nests/km<sup>2</sup>. In 2017, three species nested in higher densities than the 15-year average (American Golden-Plover, Red-necked Phalarope, and Western Sandpiper) and nine nested at densities below the 15-year average (Dunlin, Baird's Sandpiper, Buff-breasted Sandpipers, Long-billed Dowitcher, Pectoral Sandpiper, Red Phalarope, Ruddy Turnstone, Semipalmated Sandpiper, and White-rumped Sandpiper).

The first shorebird clutch was initiated on 4 June—3 days later than the long-term average of 1 June. Median initiation date was 20 June—5 days later than the long-term average. Median nest initiation dates for the more abundant species were 13 June for Dunlin, 16 June for Semipalmated Sandpiper, 20

June for Red Phalarope, and 20 June for Pectoral Sandpiper. Median initiation dates were 2–6 days later for all species compared to their respective 15-year averages.

Predators destroyed 86.5% of the known-fate nests in 2017 (excluding human-caused mortalities). This is substantially greater than the long-term average of 31.3%, but only somewhat greater than the 62.2% average for other years without fox control (2003–2004). Apparent hatching success (# hatching at least one young/total number of known-fate nests) was highest in Dunlin (33.3%) and Red-necked Phalarope (20%), and lowest in Red Phalarope (12.4%), American Golden-Plover (10.0%), Western Sandpiper (6.7%), Pectoral Sandpiper (2.6%), Long-billed Dowitcher (0.0%), and Semipalmated Sandpiper (0.0%).

We captured and color-marked 170 adults located both on and off plots. This was less than the 308 banded in 2016 and the 15-year average of 287. Thirty of these adults (24 Dunlin, 3 Semipalmated Sandpiper, 2 American Golden-Plover, and 1 Red Phalarope) had been banded as adults in a prior year. Adults captured included 62 Dunlin, 40 Semipalmated Sandpiper, 32 Red Phalarope, 15 Pectoral Sandpiper, 11 American Golden-plover, and 10 Western Sandpiper. We also re-sighted 29 adults banded in prior years nesting on our plots in 2017. This included 17 Dunlin, 4 Semipalmated Sandpiper, 2 American Golden-Plover, 2 Red Phalarope, 2 Red-necked Phalarope, and 2 Western Sandpiper. We captured and color-marked 112 chicks. This was less than the 15-year average of 536, and lower than any other year.

This study fulfills action items identified in the Alaska Shorebird Conservation Plan under the Research section (i.e., “encourage long-term studies synthesizing measures of shorebird breeding phenology and environmental conditions”) and Population Monitoring section (i.e., “monitor demographic parameters to better understand limiting factors at the population level”).

Field assistance for conducting this work was provided by Ben Lagassé (crew leader), Jillian Cosgrove (Director’s Fellow Program), Wyatt Engelhoff, Sara Hoepfner, Lindall Kidd, Laura Makielski, Alexandra Munters, and Kaori Tsujita. Funding and logistical support was provided by the National Fish and Wildlife Foundation, Manomet, Inc., and USFWS Migratory Bird Management division.

*Location:* Utqiagvik (formerly Barrow), Alaska, North Slope, 71.29°N, 156.64°W

*Contact(s):* Richard Lanctot, Shorebird Coordinator, U.S. Fish and Wildlife Service, 1011 East Tudor Road, MS 201, Anchorage, AK 99503, Email: richard\_lanctot@fws.gov, Phone: 907-786-3609

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## #17— TRACKING MIGRATIONS OF PACIFIC GOLDEN-PLOVERS

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Investigators: Oscar Johnson, Montana State University; Michael Weber, BYU-Hawaii; David Bybee, BYU-Hawaii; Lee Tibbitts, USGS, Anchorage; Diane Smith, Cape Elizabeth, ME; Paul Brusseau, Anchorage; Nancy Brusseau, Anchorage

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*Summary:* We attached Lotek Pinpoint GPS tags to 11 Pacific Golden-Plovers (8 males, 3 females) nesting near Nome. Tags were programmed to record the fall migration. Data recovery via Argos indicated pre-departure stopovers on the Yukon-Kuskokwim Delta, followed by flights to wintering grounds in Marshall Is. (Mili Atoll), Kiribati (Maiana Atoll), Midway Is., New Guinea (the foregoing all nonstop), and Queensland (possibly nonstop). In addition, there were two notable findings associated with previous studies: 1) We recaptured a geolocator-equipped male plover that we had tagged near Glacier Creek in 2015. Although two years had elapsed, we were able to recover tracking data from the logger showing that the bird had wintered in Hawaii, at or near Hilo. 2) To our surprise, the mate of the geo-bird also was banded, and she turned out to be an individual we had marked in 2010 (the bird had been unseen since that time) at a nest 5 km distant. This substantial shift in nesting locations was yet another example of low site-fidelity among female plovers, a trait that makes them difficult to study.

*Location:* Nome, Seward Peninsula. Two study sites: Glacier Creek Area (64.58° N, 165.46° W) and Woolley Lagoon (64.87° N, 166.26° W).



*Figure 17.1.* A male plover near his nest at Glacier Creek, June 2017. The bird is carrying a Pinpoint-GPS tag with trailing aerial. Photo by O.W. Johnson.

*Contact:* Oscar (Wally) Johnson [owjohnson2105@aol.com](mailto:owjohnson2105@aol.com)

#18— SHOREBIRD INTERPRETIVE WORK AND RELATED FESTIVALS  
ON THE TONGASS NATIONAL FOREST IN 2017

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Compiled by Bonnie Bennetsen, Wildlife Program Manager, Tongass National Forest  
Contributors: Susan Oehlers, Joe Delabruue

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During 2017, the Yakutat Ranger District led shorebird viewing field trips for elementary school students during their annual “Sea Week.” Student Conservation Association intern Analeigh Sanderson also led a bird-themed interpretive dance session with the students. The Yakutat Tern Festival in early June additionally included several adult and youth field trips, some of which included viewing of late migrating shorebirds.

*Location:* Yakutat, Alaska

*Contact:* Susan Oehlers, Wildlife Biologist, Yakutat Ranger District, mailing: P.O. Box 327, physical: 712 Ocean Cape Road, Yakutat, AK 99689, [soehlers@fs.fed.us](mailto:soehlers@fs.fed.us), 907-784-3359

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The 2017 Stikine River Birding Festival featured activities including art, photo, bird song & food contest, marine debris collection, birding 101 class, mini film fest, video and still photography presentation, bird walk, bird house building and a presentation from USGS Alaska Science Center biologist Dan Ruthrauff who spoke about Rock Sandpipers. Dr. Ruthrauff’s presentation was titled *Coping with the Cold: The Unusual Occurrence of Rock Sandpipers in Cook Inlet during Winter*.

*Location:* Wrangell, Alaska

*Contact:* Joe Delabruue, Wildlife Biologist, Wrangell Ranger District, mailing: P.O. Box 51, physical: 525 Bennett Street, Wrangell, AK 99929, [jdelabruue@fs.fed.us](mailto:jdelabruue@fs.fed.us), 907-874-7523



## #19 – ARCTIC SHOREBIRD DEMOGRAPHICS NETWORK: OVERVIEW

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Investigators: Emily Weiser, U.S. Geological Survey; Stephen Brown, Manomet Center for Conservation Science; Richard Lanctot, U.S. Fish and Wildlife Service; and Brett Sandercock, Norwegian Institute for Nature Research, and many other ASDN collaborators

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To better understand how shorebirds will respond to climate-mediated changes in the Arctic's morphology and ecology, we established a network of field sites across Alaska, Canada, and Russia, known as the Arctic Shorebird Demographics Network (ASDN). Our work was conducted over five years (2010–2014) at 16 field sites by 32 principal investigators and 11 graduate students (4 PhD, 7 M.Sc.) from 15 institutions. We used standardized field protocols to collect information on shorebird ecology and demography, as well as a suite of predictor variables related to demographic parameters and climate change. Here we include the titles from overview papers that were recently published or are in press and discuss other papers in the works. Many additional papers are being prepared by graduate students who used samples collected by ASDN personnel.

Two additional papers are in the works. The first focuses on the effects of leg flags on nesting success of Arctic-breeding shorebirds. The second uses previously published and unpublished estimates of vital rates and relationships with environmental covariates to develop range-wide population models for five species of Arctic-breeding shorebirds: Red Phalarope, Red-necked Phalarope, Dunlin, Semipalmated Sandpiper, and Western Sandpiper.

The ASDN focused on four *priority species* identified in the Alaska Shorebird Conservation Plan (2008), including the American Golden-Plover, Western Sandpiper, Dunlin, and Buff-breasted Sandpiper. The study also fulfills three Alaska-wide *research* objectives, including to: “investigate causes of shorebird population declines,” “encourage long-term studies synthesizing measures of shorebird breeding phenology and environmental conditions,” and “develop quantitative population models, measure key demographic parameters, and analyze population dynamics to estimate the long-term effects of subsistence harvest, depressed productivity, and other factors that may affect viability of shorebird populations” (Alaska Shorebird Conservation Plan 2008). Finally, the study fulfills one Alaska-wide *monitoring* objective, which is to “monitor demographic parameters and use demographic models to better understand limiting factors at the population level” (Alaska Shorebird Conservation Plan 2008).

*Location:* Alaskan ASDN study sites were at Nome, Cape Krusenstern, Utqiagvik (formerly Barrow), Colville River Delta, Prudhoe Bay, and Canning River Delta.

*Contact:* Emily Weiser, U.S. Geological Survey, 2630 Fanta Reed Rd, La Crosse, WI 54603, E-mail: [Emily.l.weiser@gmail.com](mailto:Emily.l.weiser@gmail.com), Phone: 785-571-3403; Stephen Brown, Manomet Center for Conservation Sciences, P.O. Box 545, Saxtons River, VT 05154, Email: [sbrown@manomet.org](mailto:sbrown@manomet.org), Phone: 774-454-

0030; Richard Lanctot, US Fish and Wildlife Service, Migratory Bird Management, 1011 East Tudor Road, MS 201, Anchorage, AK 99503, E-mail: Richard\_lanctot@fws.gov. Phone: 907-786-3609.

## #20— CONSERVING SHOREBIRDS THROUGH COMMUNITY ENGAGEMENT

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Investigators: Richard Lanctot, Jim Johnson, Vanessa Loverti, and Gilbert Castellanos, U.S. Fish and Wildlife Service; Erin Cooper, U.S. Forest Service; Joe Buchanan, Washington Department of Fish and Wildlife; Eduardo Palacios Castro, Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE) Unidad La Paz; Humberto Berlanga, Comisión Nacional para el Conocimiento y Uso de la Biodiversidad; Garry Donaldson, Canadian Wildlife Service, and Vicky Johnston, Environment and Climate Change Canada

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In 2015, a two-year project was funded by the Commission for Environmental Cooperation (the environmental arm of the North American Free Trade Agreement) to engage communities to identify threats and conservation actions for protection at eight sites used by priority shorebirds in Canada, Mexico, and the United States (Bay of Fundy, James Bay, Alto Golfo de California/Delta del Río Colorado, Bahía de Todos Santos, Delaware Bay, Copper River, Georgia Barrier Islands, Willapa Bay). As a result, human disturbance was identified as the main threat to shorebird conservation at several sites, leading to the prioritization of actions to reduce this threat through raising awareness and demonstrating the local benefits of conservation. At more remote sites, the need for more data on the use of the sites by the migratory birds was identified.

In 2017, the second two-year project was funded to implement the actions that were identified for each site during prior project. This new project will conduct educational/outreach efforts at the eight sites identified above to promote community participation and protection of the sites. In addition, funds will be used to track Red Knots as they migrate from Washington State to Alaska and Russia, and back to Mexico again. Other funds will be used to have the Cornell Laboratory of Ornithology create a short video to show how people value shorebirds differently throughout the Pacific Flyway, and to look for “common ground” as a means to conserve shorebirds. The project will also monitor the effectiveness of selected actions and provide an analysis of the economic incentives and key considerations of ecotourism.

This project focuses on three *priority species* identified in the Alaska Shorebird Conservation Plan (2008), including the Red Knot, Western Sandpiper, and Dunlin. The study also fulfills one Alaska-wide *research* objective: “develop and implement contemporary research techniques to identify unique populations of shorebirds that reside in Alaska and to link sites used throughout their annual cycles”, and one *environmental education and public outreach* objective: “raise the profile of Alaska’s shorebirds by supporting shorebird festivals in Alaska and by collaborating with education programs on the Copper River Delta and elsewhere” (Alaska Shorebird Conservation Plan 2008). Finally, the study fulfills one Alaska-wide *international collaboration* objective, which is to “coordinate and participate in international, national and other regional shorebird conservation planning efforts” (Alaska Shorebird Conservation Plan 2008).

*Location:* The only Alaskan site is at the Copper River Delta, Alaska (60.54°N, 145.7°W).

*Contact:* Richard Lanctot, US Fish and Wildlife Service, Migratory Bird Management, 1011 East Tudor Road, MS 201, Anchorage, AK 99503, E-mail: Richard\_lanctot@fws.gov. Phone: 907-786-3609.

## #21— PACIFIC AMERICAS SHOREBIRD CONSERVATION STRATEGY: IMPLEMENTING SHOREBIRD CONSERVATION ACROSS THE PACIFIC AMERICAS FLYWAY.

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River Gates, Stan Senner, and Brad Andres

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The Pacific Americas Shorebird Conservation Strategy (Strategy) is an international effort to identify significant threats, develop effective conservation actions, and establish coordinated approaches necessary to maintain and restore populations of shorebirds and their habitats in the Pacific Americas Flyway. Shorebirds are faced with many challenges due to their often long-distance migrations, reliance on coastal, wetland, and grassland habitats, and vulnerability to environmental and anthropogenic perturbations. The Strategy focuses primarily on the Pacific coasts of the Americas and spans 120 degrees of latitude from northeastern Russia to southern Chile (Figure 21.1). We used the *Open Standards for the Practice of Conservation* to identify 21 target species, 7 major threats, and 60 effective actions across the project area. We aggregated a series of regional activities into a portfolio of actions that can be implemented to conserve shorebirds throughout the Flyway.

The very process of developing the Strategy has already enabled partners to work together throughout the Flyway in a more coordinated way. We established a working group to address the threat of shrimp aquaculture operations in Latin America. The working group will initially focus on developing a *Shrimp Aquaculture and Shorebird Assessment* to provide a comprehensive overview of shrimp aquaculture production and the positive and negative interactions with shorebirds. The initial geographic focus will examine the context of shrimp production and shorebird use and distribution in Northern and Southern Mesoamerican Mangrove Forests of Mexico, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama. After the assessment is complete the working group will develop regional and site-specific conservation strategies and actions. Our ongoing efforts are focused on implementation of key components of the Strategy, including increased coordination and communications, and identifying areas of overlap where shorebird conservation strategies and actions align with the programs and priorities of international conservation agreements, international lending institutions and natural resource agencies. More specifically, we are evaluating the potential to advance implementation of the Strategy by linking it to ongoing missions and programs within these institutions.





Figure 21.1. Project area for the Pacific Americas Shorebird Conservation Strategy. Map credit: Liling Lee/National Audubon Society

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## #22— MIGRATORY MOVEMENTS OF SOLITARY SANDPIPER

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Investigators: Jim Johnson, USFWS; Laura McDuffie, USFWS; Lucas DeCicco, University of Kansas

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The migratory tracking study of Solitary Sandpipers began on Joint Base Elmendorf-Richardson, Anchorage, Alaska, in 2016 (Figures 22.1, 22.2). The study objectives include: 1) understanding site fidelity and vital rates of breeding adults and 2) determining important stopover sites for migrating Solitary Sandpipers. In 2016, we deployed 0.7-g geolocators attached to modified leg bands on four adults. In 2017, we recovered 3 geolocators and deployed an additional 10 geolocators on breeding adults.

Our preliminary results indicate that birds used the Central Flyway in autumn to reach wintering areas in northeastern Argentina. On average, it took birds 70 days to reach wintering areas due to the frequency of stops and the length of stay at each stopover site, which ranged from 2 to 29 days. Spring migration routes were similar to autumn routes; however, birds completed spring migration in 30 days on average, and stopped for shorter durations of 2 to 21 days. The average distance traveled during autumn and spring migrations was 24,734 km.

*Location:* Joint Base Elmendorf-Richardson, Anchorage, AK

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*Figure 22.1.* Solitary Sandpiper adult carrying a geolocator. Credit: Benjamin Clock, Conservation Media.



*Figure 22.2.* The first ever Solitary Sandpiper upon which a geolocator was deployed on and from which data were retrieved. L. McDuffie, USFWS.

## #23— MIGRATORY CONNECTIVITY OF LESSER YELLOWLEGS

Investigators: Katie Christie, ADFG; Jim Johnson, USFWS; Laura McDuffie, USFWS; Audrey Taylor, UAA; Lee Tibbitts, USGS

Shorebird hunting is a significant threat to Lesser Yellowlegs that stage and/or overwinter in Caribbean and northern South American countries (Clay et al. 2012). It has been estimated that 7,000 to 15,000 individuals are killed in shooting swamps on Barbados annually (Burke 2008, Reed and Burke 2011). The objectives of this study include: 1) determining migratory pathways and important sites using light-level geolocators and GPS tags, 2) determining if genetic markers can be used to identify migratory connectivity, 3) understanding the breeding origins of harvested birds, 4) determining the vital rates of populations in Alaska, and 5) understanding what conservation actions can be taken to reduce unregulated hunting in the Caribbean and South America.

This collaborative study will include several locations across the species' breeding range, from Alaska to Ontario (Figures 23.1, 23.2). In 2018, we will expand upon current migration tracking efforts by deploying GPS tags on breeding adults. Our goal is to collect data on the complete migratory movements of birds during autumn migration.

*Location:* Joint Base Elmendorf-Richardson, Anchorage, AK; McClelland Lake, Alberta; Yellowknife, Northwest Territories; Churchill, Manitoba; James Bay, Ontario.



Figure 23.1. Proposed capture locations for Lesser Yellowlegs.



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Figure 23.2. A Lesser Yellowlegs wearing a geolocator deployed in 2016. Credit: L. McDuffie, USFWS.

*Citations:*

- Clay, R. P., A. J. Lesterhuis and S. Centrón. Conservation plan for the Lesser Yellowlegs (*Tringa flavipes*) (Version 1.0). Manomet Center for Conservation Sciences 2012.
- Burke, W. 2008. "Barbados." In Important bird areas in the Caribbean: Key sites for conservation, edited by D. Wege and V. Anadón-Irizarry, 82-89. Cambridge: BirdLife International.
- Reed, E. T. and W. Burke. 2011. Assessment of shorebird harvest in Barbados and development of a harvest strategy. Vancouver: Presentation at IV Western Hemisphere Shorebird Group.



## #24— BIRDS ‘N’ BOGS CITIZEN SCIENCE PROGRAM

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Investigators: Audrey Taylor, University of Alaska Anchorage; Marian Snively, Katie Christie, and Julie Hagelin, Alaska Department of Fish & Game; Laura McDuffie, U.S. Fish and Wildlife Service; Andi Parrott, University of Alaska Anchorage; Liz Gustafson and Nils Warnock, Audubon Alaska

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2017 represented the fifth year of Birds ‘n’ Bogs, a citizen science program initiated through Audubon Alaska and the University of Alaska Anchorage’s (UAA) Department of Geography and Environmental Studies. The goal of this program is to document spring distribution of boreal birds in wetland habitats of Anchorage and the Matanuska Valley, as well as to foster communication and collaboration between university students and long-term Anchorage residents, two populations for whom contact is limited. In 2016, we combined the Birds ‘n’ Bogs program with the Alaska Department of Fish and Game’s Loon and Grebe Watch program, so we now monitor a total of 12 boreal wetland species throughout the month of May by visiting each surveyed wetland at least 4 times. Thus, totals presented in this abstract likely include repeat observations of a single individual.

A total of 41 volunteers participated in the Birds ‘n’ Bogs program in 2017. Participants reported (visual and audible detections combined) 170 Lesser Yellowlegs, 82 Greater Yellowlegs, 13 Solitary Sandpipers, 86 Rusty Blackbirds, 7 Olive-sided Flycatchers, 563 Tree Swallows, 309 Violet-Green Swallows, 9 Common Loons, 33 Pacific Loons, 110 Red-throated Loons, 10 Horned Grebes, and 289 Red-necked Grebes. Data analysis for our annual report is ongoing.

We plan to continue this effort in 2018 using a more rigorous survey framework that will enable occupancy analysis moving forward. Additionally, we are working on a publication assessing Common and Pacific Loon abundance and productivity trends from the first 30 years of loon data from the Loon and Grebe Watch program. Lastly, Sabre Hill (MS student, UAA) will be using the Anchorage Birds ‘n’ Bogs data from 2013–2017 to compare habitat use by declining boreal wetland bird species (including Greater and Lesser Yellowlegs and Solitary Sandpipers) across wetlands in Joint Base Elmendorf-Richardson (JBER) and Anchorage.

*Location:* south-central Alaska: Anchorage, JBER, Matanuska-Susitna Borough

*Contact(s):* Audrey Taylor, Department of Geography & Environmental Studies, UAA. (907) 786-6854, [artaylor@alaska.edu](mailto:artaylor@alaska.edu)

#25— INFLUENCE OF WETLAND CONTEXT ON THE DISTRIBUTION AND  
ABUNDANCE OF BOREAL BIRDS

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Investigators: Sabre Hill, University of Alaska Anchorage; Dr. Audrey Taylor, University of Alaska Anchorage

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The human footprint on boreal forest habitat is increasing, particularly in the Anchorage/ Matanuska-Susitna region where an average annual growth rate of 0.85% has been recorded since 2010. Modification of boreal forest for commercial and residential development may be affecting habitat quality for boreal bird species, many of which are already in decline.

The purpose of this research is to better understand how habitat used by declining boreal bird species may be changing as a result of this human footprint. We plan to accomplish this objective by contrasting the nesting habitat use of migratory boreal bird species on relatively unimpacted wetlands located on Joint Base Elmendorf-Richardson (JBER) with comparable wetlands within the urbanized Anchorage metropolitan area (Figure 25.1).

We will use ArcGIS to quantify habitat characteristics at the wetland and landscape scales and use these variables to predict occupancy of several declining boreal bird species, including Greater and Lesser Yellowlegs, Solitary Sandpiper, and Wilson's Snipe. We will then evaluate how occupancy and habitat use differ by location as a means of understanding how development in Anchorage is affecting habitat selection by boreal birds. This work began in spring 2017 and will likely be completed by spring 2019.

*Location:* Anchorage and JBER wetlands.

*Contact(s):* Sabre Hill, University of Alaska Anchorage, MS Candidate, smhill2@alaska.edu, (303) 912-1447; Audrey Taylor, University of Alaska Anchorage, Department of Geography and Environmental Studies, artaylor@alaska.edu, (907) 786-6854.



*Figure 25.1. JBER Summer 2017 Photo Credit: Sabre Hill.*

## #26— FACTORS INFLUENCING WATERBIRD ABUNDANCE ON THE COPPER RIVER DELTA

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Investigators: Jillian Jablonski, Audrey Taylor, University of Alaska Anchorage

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The Copper River Delta (Delta) is a highly productive coastal wetland and an important breeding ground for waterbirds. We are investigating a suite of biological, chemical, and physical factors to understand what is driving waterbird distribution and breeding chronology on the Delta, and how the aquatic invasive plant *Elodea canadensis* and differences in pond temperatures may be affecting the food web supporting the waterbird community. 2017 was the second and final field season for this project. Sixteen study ponds were selected along a gradient of temperature and hydrological characteristics. In 2017, each pond was visited five times, at approximately two-week intervals from May 24–August 2. All waterbirds on or within 10 m of the pond edge were recorded to species. Nests near ponds were recorded and monitored for success.

During the 2017 field season, we recorded a total of 523 adult waterbirds, including 4 shorebird species: Lesser Yellowlegs, Red-necked Phalarope, Short-billed Dowitcher, and Wilson's Snipe. Red-necked Phalarope was the species of greatest shorebird and overall abundance in our surveys, with a total of 102 observations across 10 ponds. Lesser Yellowlegs, Short-billed Dowitchers, and Wilson's Snipe were observed in substantially fewer numbers. Five Red-necked Phalarope nests (or suspected nests) were observed, four of which were located adjacent to the same pond. We plan to analyze waterbird foraging guild densities, species diversity (Shannon Weiner Diversity Index), and habitat characteristics across study ponds using multivariate analysis of variance (MANOVA) techniques. Significant relationships identified via multivariate techniques will then be analyzed using univariate and regression techniques. Given that Red-necked Phalaropes were the most abundant species across study ponds, we will also investigate relationships specifically between habitat variables and their distribution and abundance. Anticipated project completion date is June 30, 2018.

*Location:* Copper River Delta

*Contact(s):* Jillian Jablonski, Department of Geography and Environmental Studies, University of Alaska Anchorage. Phone: 630-542-9424; email: [jjablonski@alaska.edu](mailto:jjablonski@alaska.edu)

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## #27— MIGRATION OF BUFF-BREASTED SANDPIPERS

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Investigators: Lee Tibbitts, U.S. Geological Survey; Rebecca Bentzen, Wildlife Conservation Society; Bart Kempenaers, Max Planck Institute for Ornithology; and Richard Lanctot, U.S. Fish and Wildlife Service

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We continued a satellite telemetry study in 2017 to determine range-wide migratory routes, migratory timing, and stopover habitats of Buff-breasted Sandpipers (*Calidris subruficollis*). This species breeds in low densities across the High Arctic in Russia, Alaska, and Canada, and winters primarily in the pampas grasslands of Brazil, Uruguay, and Argentina. Ten 2.0-gram PTT Argos tags manufactured by Microwave Telemetry, Inc. were deployed in May on males at stopover sites in coastal Texas (Figures 27.1, 27.2) and transmitted locations daily as birds migrated north along the Central Flyway, spent the summer in Arctic Canada, and then traveled south also along the Central Flyway and on to wintering areas. Eight 4.0-gram GPS Argos Pinpoint tags manufactured by Lotek Wireless were deployed in June on males at Prudhoe Bay, Alaska; these tags collected locations every two days, and transmitted three locations at a time to the Argos satellite system as birds left Prudhoe Bay and migrated east to Arctic Canada and then south along the Central Flyway. We currently are deploying 12 PTT Argos and 18 GPS Argos Pinpoint tags on birds wintering in Argentina, Brazil and Uruguay (more on this in the 2018 summary).

We received location data from all of the PTT-tagged birds that confirmed last year's tracks that indicated birds left Texas during the second week of April and hopped north along a narrow corridor in the Central Flyway to arrive in late May at a pre-breeding stopover area in southern Saskatchewan. Total distance travelled was about 2,500 km and birds made two or more stops in Oklahoma, Kansas, Nebraska, South Dakota, or North Dakota. Birds continued north an additional 1,800–2000 km in the first week of June and arrived near potential breeding sites in the Central Canadian Arctic that concentrated on the east peninsula region of Nunavut. In contrast to the 2016 deployment, none of the birds traveled to Alaska. Most of the birds moved among the Canadian islands during June where they spent several days to weeks at each spot before beginning their southbound migration in early August. Five birds remained on the air to document southbound migration, which occurred over a broader front within the Central Flyway and progressed more slowly than during the spring. Three of these birds migrated south across Central America in September (after hunkering down during Hurricane Harvey); two stopped in Panama and ground observations there suggest these may be previously undocumented stopover locations. Birds also stopped in diverse habitats in Colombia, Bolivia, and Paraguay during September and October before reaching sites in inland Argentina and Uruguay.

We also received good information from the Pinpoint-tagged birds. All eight birds traveled slowly eastward along the North Slope and then spent several days to weeks at multiple locations in Nunavut. Stopover durations suggest males may be displaying in new locations or fattening up prior to migrating south. Their locations overlapped with those of the PTT Argos-tagged birds in several cases. Birds continued south along a broad front in the Central Flyway before data collection ceased (a maximum of 30 locations was reached).



This study is focused on the Buff-breasted Sandpiper, one of the priority shorebird species identified in the Alaska Shorebird Conservation Plan (Alaska Shorebird Group 2008). The study also fulfills action items identified in the Alaska Shorebird Conservation Plan under the Research section (i.e., “develop and implement contemporary research techniques (e.g., PTT and GPS tags) to identify unique populations of shorebirds that reside in Alaska and to link sites used throughout their annual cycles”), and the International Collaborations section (i.e., “foster cooperative research efforts throughout the Western Hemisphere, Asia, and elsewhere along migratory flyways”, AND “participate in species-specific conservation planning efforts”).

Field assistance for conducting this work was provided by Brent Ortego and Bob Friedrichs in Texas, and Devon Short and Peter Detwiler at Prudhoe Bay. Lang Alford and the Texas Parks and Wildlife Department allowed us to stay at their Mad Island Wildlife Management Area bunkhouse in Texas. BP Exploration (Alaska), Inc. (especially Christina Pohl, Kyla Choquette, and Anna Dugan) helped us gain access to the Prudhoe Bay oil field and provided logistical support. Funding was provided by the Max Planck Society, Environment and Climate Change Canada, US. Geological Survey Science Support Program, U.S. Fish and Wildlife Service, and the U.S. Geological Survey.

*Location:* Prudhoe Bay Alaska, North Slope, 70.36°N, 148.75°W

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*Figure 27.1.* Cannon netting for Buff-breasted Sandpipers, Texas. Photo Credit: Loren Gallo



*Figure 27.2.* Rick Lanctot waiting at whoosh net to capture Buff-breasted Sandpipers, Texas. Photo Credit: Brent Ortego

## #28— SHOREBIRDS IN ALASKA NATIVE CULTURES: SUBSISTENCE HARVEST AND LOCAL AND TRADITIONAL KNOWLEDGE

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Investigators: Liliana C. Naves and Jacqueline M. Keating, Alaska Department of Fish and Game Division of Subsistence; Daniel R. Ruthrauff and Theresa Lee Tibbitts, U.S. Geological Survey Alaska Science Center

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Shorebird population declines in the East Asian-Australasian Flyway have increased the need for information and collaboration across shorebird distribution ranges. Shorebirds represent about 1% of the subsistence bird harvest in Alaska. But shorebird harvest data are not easily accessible and little is known about the importance of shorebirds as subsistence resources for Alaska's indigenous peoples. The objectives of this study are: (1) to compile available subsistence harvest data, (2) to learn about the importance of shorebirds as cultural and food resources for Alaska's subsistence communities, and (3) to document indigenous knowledge about shorebirds. This study has three components: a compilation of available harvest data for all Alaska regions; indigenous knowledge interviews in the Yukon-Kuskokwim Delta region; and communication and outreach efforts to increase awareness among subsistence users about shorebird conservation issues.

Interviews with local, knowledgeable people have documented shorebird indigenous knowledge, clarified ethnotaxonomy and Native bird names, and provided better understanding of shorebirds as cultural and food resources. About 70 interviews were completed at Quinhagak, Toksook Bay, Platinum, Hooper Bay, and Bethel. Ethnotaxonomy and ethnographic information are being summarized.

Preliminary harvest estimates were generated for each of Alaska's regions and for the whole state using data from surveys conducted in 1990–2015. The main data sources were the databases of the Harvest Assessment Program of the Alaska Migratory Bird Co-Management Council [http://www.adfg.alaska.gov/index.cfm?adfg=subsistence.migratorybird\\_cmc](http://www.adfg.alaska.gov/index.cfm?adfg=subsistence.migratorybird_cmc) and the Community Subsistence Information System <http://www.adfg.alaska.gov/sb/CSIS/>.

Information collected in the local and traditional knowledge interviews are guiding the development of conservation messages that are culturally appropriate and meaningful. Communication and outreach materials referring to shorebird ecology, migrations, subsistence uses, and conservation will be produced in English and Yup'ik and distributed in western Alaska communities.

*Location:* Harvest estimates were generated for each of Alaska's regions and for the whole state; ethnotaxonomy and ethnography findings focus on the Yukon-Kuskokwim delta region.

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## #29— BREEDING ECOLOGY OF TUNDRA NESTING BIRDS AT THE CANNING RIVER DELTA ON ARCTIC NWR

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Investigators: Christopher Latty, U.S. Fish and Wildlife Service; Stephen Brown,  
Manomet, Inc

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The Canning River Delta study site in Arctic Refuge was established in the late 1970s and has since become the primary tundra nesting bird research station for the refuge. Work at this location is a collaboration between Arctic National Wildlife Refuge, Manomet, Inc., FWS Migratory Birds, University of Alaska Fairbanks, and the U.S. Geological Survey. From May 31-July 18, 2017, a crew of up to 9 conducted work at the camp. The first shorebird nest was found on June 6. We located 340 nests, of which, 163 were shorebirds from 9 species. We captured 92 birds and collected cloacal swabs and serum for disease analyses. We also collected geolocators from 3 Dunlin tagged in 2016 and marked 9 Dunlin and 15 Semipalmated Sandpipers with Pinpoint gps loggers as part of the North Slope post-breeding movement study described elsewhere. In addition to our core monitoring of nesting birds, this year we implemented pilot projects for fox and lemming abundance, continued an assessment of the feasibility of using nest cameras to determine predators and reduce human disturbance, and broadened our waterfowl search area and research questions. The 2017 field season was characterized by a cold start in June, apparently low densities of fox and lemmings, and fewer shorebird and more waterfowl nests than have been recorded in prior years. We are still reviewing camera footage, but preliminary data suggests red foxes were responsible for most waterfowl nest depredation, which is noteworthy, as red fox have been relatively uncommon at this location in the past.

*Location:* Canning River Delta, Arctic National Wildlife Refuge

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## PUBLICATIONS

- Bentzen, R., S. Dinsmore, J. Liebezeit, M. Robards, B. Streever, and S. Zack. 2017. Assessing development impacts on Arctic nesting birds using real and artificial nests. *Polar Biology* 1527–1536.
- Brown, S., C. Gratto-Trevor, R. Porter, E.L. Weiser, D. Mizrahi, R. Bentzen, M. Boldenow, R. Clay, S. Freeman, M-A. Giroux, E. Kwon, D.B. Lank, N. Lecomte, J. Liebezeit, V. Loverti, J. Rausch, B.K. Sandercock, S. Schulte, P. Smith, A. Taylor, B. Winn, S. Yezerinac, and R.B. Lanctot. 2017. Migratory connectivity of Semipalmated Sandpipers and implications for conservation. *The Condor: Ornithological Applications* 119:207–224.
- Bulla, M., M. Valcu, A.M. Dokter, A.G. Dondua, A. Kosztolányi, A. Rutten, B. Helm, B.K. Sandercock, B. Casler, B.J. Ens, C.S. Spiegel, C.J. Hassell, C. Küpper, C. Minton, D. Burgas, D.B. Lank, D.C. Payer, E.Y. Loktionov, E. Nol, E. Kwon, F. Smith, H.R. Gates, H. Vitnerová, H. Prüter, J.A. Johnson, J.J.H. St Clair, J-F. Lamarre, J. Rausch, J. Reneerkens, J.R. Conklin, J. Burger, J. Liebezeit, J. Bêty, J.T. Coleman, J. Figuerola, J.C.E.W. Hooijmeijer, J.A. Alves, J.A. M. Smith, K. Weidinger, K. Koivula, K. Gosbell, L. Niles, L. Koloski, L. McKinnon, L. Praus, M. Klaassen, M-A. Giroux, M. Sládeček, M.L. Boldenow, M. Exo, M.I. Goldstein, M. Šálek, N. Senner, N. Rönkä, N. Lecomte, O. Gilg, O. Vincze, O.W. Johnson, P.A. Smith, P.F. Woodard, P.S. Tomkovich, P. Battley, R. Bentzen, R.B. Lanctot, R. Porter, S.T. Saalfeld, S. Freeman, S.C. Brown, S. Yezerinac, T. Székely, T. Montalvo, T. Piersma, V. Loverti, V-M. Pakanen, W. Tijssen, and B. Kempnaers. 2016. Unexpected diversity in socially synchronized rhythms of shorebirds. *Nature* 540:109–113. DOI:10.1038/nature20563.
- Grond, K., R.B. Lanctot, A.M. Jumpponen, and B.K. Sandercock. (in press) Recruitment and establishment of the gut microbiome in Arctic shorebirds. *FEMS Microbiology Ecology*.
- Johnson, O.W., P.S. Tomkovich, R.R. Porter, E.Y. Loktionov, and R.H. Goodwill. 2017. Migratory linkages of Pacific Golden-Plovers *Pluvialis fulva* breeding in Chukotka, Russian Far East. *Wader Study* 124:33–39.
- McCarty, J.P., L.L. Wolfenbarger, C.D. Laredo, P. Pyle, and R.B. Lanctot. 2017. Buff-breasted Sandpiper (*Calidris subruficollis*), version 3.0. . In: *The Birds of North America* (P.G. Rodewald, editor). Cornell Lab of Ornithology, Ithaca, New York, USA.
- Saalfeld, S.T., and R.B. Lanctot. 2017. Multispecies comparisons of adaptability to climate change: a role for life-history characteristics? *Ecology and Evolution* DOI: 10.1002/ece3.3517.
- Senner, N.R., M. Stager, and B.K. Sandercock. 2017. Ecological mismatches are moderated by local conditions for two populations of a long-distance migratory bird. *Oikos* 126:61–72.
- Swift, R.J., A.D. Rodewald, and N.R. Senner. 2017. Environmental heterogeneity and biotic interactions as potential drivers of spatial patterning of shorebird nests. *Landscape Ecology* 32(8):1689–1703.
- Swift, R.J., A.D. Rodewald, and N.R. Senner. 2017. Breeding habitat of a declining shorebird in a changing environment. *Polar Biology* 40(9):1777–1786.



- Taylor, A.R., R.B. Lanctot, and R.T. Holmes. (in press). An evaluation of 60 years of shorebird response to environmental change at Utqiagvik (Barrow), Alaska. *Western Birds*.
- Weiser, E.L., S.C. Brown, R.B. Lanctot, H.R. Gates, K. Abraham, R.L Bentzen, J. Bêty, M.L. Boldenow, R. Brook, T.F. Donnelly, W.B. English, S.A. Flemming, S.E. Franks, H.G. Gilchrist, M.-A. Giroux, A. Johnson, L.V. Kennedy, L. Koloski, E. Kwon, J.-F. Lamarre, D.B. Lank, N. Lecomte, J.R. Liebezeit, L. McKinnon, E. Nol, J. Perz, J. Rausch, M. Robards, S.T. Saalfeld, N.R. Senner, P.A. Smith, M. Soloviev, D. Solovyeva, D.H. Ward, P.F. Woodard, and B.K. Sandercock. (in press) Effects of environmental and ecological conditions on reproductive effort and nest success of Arctic-breeding shorebirds. *Ibis*.
- Weiser, E.L., S.C. Brown, R.B. Lanctot, H.R. Gates, K. Abraham, R.L Bentzen, J. Bêty, M.L. Boldenow, R. Brook, T.F. Donnelly, W.B. English, S. Flemming, S.E. Franks, H.G. Gilchrist, M.-A. Giroux, A. Johnson, L.V. Kennedy, L. Koloski, E. Kwon, J.-F. Lamarre, D.B. Lank, N. Lecomte, J.R. Liebezeit, L. McKinnon, E. Nol, J. Perz, J. Rausch, M. Robards, S.T. Saalfeld, N.R. Senner, P.A. Smith, M. Soloviev, D. Solovyeva, D.H. Ward, P.F. Woodard, and B.K. Sandercock. (in press) Life-history tradeoffs revealed by seasonal declines in reproductive traits of Arctic-breeding shorebirds. *Journal of Avian Biology*.
- Weiser, E.L., R.B. Lanctot, S.C. Brown, H.R. Gates, R.L. Bentzen, J. Bêty, M.L. Boldenow, W.B. English, S.E. Franks, L. Koloski, E. Kwon, J.-F. Lamarre, D.B. Lank, J.R. Liebezeit, L. McKinnon, E. Nol, J. Rausch, S.T. Saalfeld, N.R. Senner, D.H. Ward, P.F. Woodard, and B.K. Sandercock. 2018. Environmental and ecological conditions at Arctic breeding sites have limited effects on true survival rates of adult shorebirds. *The Auk: Ornithological Advances* 135:29–43.
- Zoekler C., A. E. Beresford, G. Bunting, S. U. Chowdhury, N. A. Clark, V.W. Kan Fu, Tony Htin Hla, V.V. Morozov, E. E. Syroechkovskiy, M. Kashiwagi, . G. Lappo, M. Tong , T. Le Long, Y-T Yu, F. Huettmann, H. K. Akasofu, H Tomida and G. M. Buchanan. 2016. The winter distribution of the Spoon-billed Sandpiper *Calidris pygmaeus*. *Bird Conservation International* 26:476–489.