PACIFIC SEABIRDS

A Publication of the Pacific Seabird Group

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PACIFIC SEABIRD GROUP

Dedicated to the Study and Conservation of Pacific Seabirds and Their Environment

The Pacific Seabird Group (PSG) is a society of professional seabird researchers and managers dedicated to the study and conservation of seabirds. PSG was formed in 1972 out of a need for increased communication among academic and government seabird researchers. The principal goals of PSG are to (1) increase the quality and quantity of seabird research through facilitating exchange of information; (2) identify and assess the importance of threats to seabird populations; and (3) provide government agencies and others with expert advice on managing populations of seabirds. PSG is headed by an Executive Council composed of members volunteering their time. Members include biologists, wildlife managers, students, and conservationists from the United States, Mexico, Canada, Japan and 12 other countries. PSG annual meetings and publications provide forums where members can share their findings on all research topics relating to Pacific seabirds and discuss local and large scale conservation issues. Abstracts for meetings are published on our website. PSG publishes the on-line bulletin Pacific Seabirds (formerly the PSG Bulletin; www.pacificseabirdgroup.org) and the journal Marine Ornithology (www.marineornithology.org). Other publications include symposium volumes and technical reports; these are listed near the back of this issue. PSG is a member of the Ornithological Council and the American Bird Conservancy. Annual dues for membership are $40 (individual); $30 (student, undergraduate and graduate); and $1,200 (Life Membership, payable in five $240 installments). Dues are payable to the Treasurer; see the PSG website or the Membership Information at the back of this issue.

Website

http://www.pacificseabirdgroup.org

Donations

The Pacific Seabird Group is a nonprofit organization incorporated under the laws of the State of California. Contributions to the Pacific Seabird Group are tax deductible to the fullest extent allowed by U.S. law (IRS Section 501[c][3]).

Pacific Seabirds

This on-line bulletin reports on the work and committee activities of the Pacific Seabird Group, conservation news, and other items of importance to conservation of seabirds in the Pacific Ocean. The bulletin is a twice-yearly on-line news bulletin and archive of PSG activities. This issue provides current and recent seabird work to PSG members for 2017. Back issues of the PSG Bulletin and Pacific Seabirds are posted on the group's web site.

Pacific Seabirds Editor

Jennifer Lang, editor@pacificseabirdgroup.org

Marine Ornithology

Marine Ornithology is published by the Pacific Seabird Group on behalf of a consortium of seabird groups: African, Australasian, Dutch, Japanese, Pacific, and UK. The journal is published two times a year and publishes contributed papers, forum articles, and book, website and software reviews, on all aspects of marine ornithology worldwide. For details on submitting to the journal, please go to marineornithology.org.

Change of Address

Send changes of address to the PSG Membership Coordinator, **Jennifer Lang**, membership@pacificseabirdgroup.org

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REGIONAL REPORTS FOR 2017

Compiled by: Robb Kaler, Edited by: Jennifer Lang

Regional Reports summarize current and recent seabird work to PSG members. Regional Reports generally are organized by location of the work, not affiliation of the biologist. They should not be cited without permission of the researchers.

ALASKA & RUSSIA

Compiled by Robb Kaler

ALASKA-WIDE

Ed Melvin (Washington Sea Grant), **Rob Suryan, Amanda Gladics** (Oregon State University [OSU]), and **Kim Dietrich** (Kim Dietrich Consulting) continued analyses of spatiotemporal patterns and trends in albatross and other seabird bycatch rates in Alaskan longline fleets based on over 20 years of National Oceanic and Atmospheric Administration (NOAA) groundfish fisheries observer data. The project is nearing completion, but the team did continue some outreach to the Alaska longline fishing industry in collaboration with **Anne Marie Eich** (NOAA Fisheries, Alaska Region).

Coastal Observation and Seabird Survey Team (COASST) was recently awarded funding from the North Pacific Research Board to expand beached bird monitoring in Alaska, and specifically to launch a "Die-off Alert" program that provides training on how to submit structured reports and photos of beached seabirds encountered outside of standardized monthly COASST surveys.

Don Lyons (OSU)**, Kelly Nesvacil** (Alaska Department of Fish and Game), and **Susan Oehlers** (U.S. Forest Service [USFS]) initiated a project to track the breeding season movements of Aleutian Terns (*Onychoprion aleuticus*) near Yakutat (Gulf of Alaska) and Dillingham (Bristol Bay, Bering Sea), Alaska. Fifteen terns were captured in late May and early June and fitted with satellite telemetry (Doppler PTTs) tags; most were tracked throughout the entire breeding season. The PTT data documented dispersal from known colony locations to other nesting locations. Two previously unknown colony sites were identified, both with confirmed fledging, and one colony with multiple waves of fledglings produced. Post-breeding migration routes were also identified for a majority of tagged individuals. **Robin Corcoran** (Kodiak National Wildlife Refuge [KNWR], U.S. Fish and Wildlife Service [USFWS]), **Jill Tengeres** (USFWS, OSU), **Susan Oehlers, Sanjay Pyare** (University of Alaska Southeast), **Janelle Lopez** (USFS), and **Don Lyons** conducted Aleutian Tern nest monitoring at colonies in the Kodiak Archipelago and near Yakutat, Alaska. Several types of predators were observed to cause nest failure. Photos of prey fed to chicks were also collected at one colony at Kodiak Island.

Autumn-Lynn Harrison (Smithsonian Migratory Bird Center) together with field assistant **Arliss Winship** (NOAA) deployed 23 geolocators on Arctic Terns on Alaska's north slope at the ConocoPhillips Alpine Camp. The project was part of a North American range-wide study in collaboration with **Mark Maftei** (Environment Canada). In total, close to 120 tags were deployed in 8 Arctic Tern colonies throughout the U.S. and Canada. The project is a part of the Smithsonian Migratory Bird Center's Migratory Connectivity Project with the goal of revealing migratory patterns of understudied fauna, including select birds in the Arctic and North Pacific. The study is funded by ConocoPhillips Global Signature Programs.

A small pilot study to satellite track Long-tailed Jaegers (*Stercorarius longicaudus;* LTJA) from Nome, Alaska was conducted by **Autumn-Lynn Harrison**. Previous satellite tracking studies of LTJA have not been successful possibly due either to the size of the transmitter, the harness type, sensitivity of the species, or a combination of factors. Together with field crew, **Phil Bruner** (BYU-Hawaii) and **Melinda Fowler** (Springfield College), the team deployed three 5 gram satellite tags (smaller than what has previously been tried) on LTJA using leg-loop harnesses (previous harness type was fully-body). About 1 month after deployment, the tags of two birds (a mated pair) stopped transmitting. One bird was recovered dead in July soon after by **Jim Johnson** (USFWS) near its nesting / deployment location. The bird was frozen and sent back for necropsy at the Smithsonian National Zoo. The bird was confirmed shot and it is likely that its mate's tag stopped transmitting for the same reason. The recovered bird was still carrying the satellite tag with no abrasion observed. Diet samples obtained during necropsy included shell, feathers (likely shorebird chick), arthropods, and berries. The third bird remains at liberty. It departed its breeding grounds in August, and on October 7, 2017 began its southward migration after an extended high seas stopover in the eastern North Pacific Transition Zone. On October 20 it entered what may be a second stopover near French Polynesia. It has not entered an EEZ since it departed Alaska. The project is a part of the Smithsonian Migratory Bird Center's Migratory Connectivity Project with the goal of revealing migratory patterns of understudied fauna, including select birds in the Arctic and North Pacific. The study is funded by ConocoPhillips Global Signature Programs.

BERING AND CHUKCHI SEAS

Don Dragoo, Greg Thomson, and **Marc Romano** (Alaska Maritime National Wildlife Refuge [AMNWR]) collected data on populations of Common Murres (*Uria aalge*) and Thick-billed Murres (*Uria lomvia*), as well as productivity of Black-legged Kittiwakes (*Rissa tridactyla*) at Cape Lisburne,

Alaska. Annual seabird monitoring at St. George and St. Paul islands was led by **Marc Romano** (AMNWR) with summer-long field crews consisting of **Ryan Mong** and **Brady Deal** (St. Paul), and **Emily Pollom, John Gorey**, and **Sarah Guitart** (St. George). Both crews collected productivity, diet, and survival data on a variety of species including Red-faced Cormorants (*Phalacrocorax urile*), Common Murres, Thick-billed Murres, Least Auklets (*Aethia pusilla*), Black-legged Kittiwakes, and Red-legged Kittiwakes (*Rissa brevirostris*). In addition, population counts (conducted every three years in the Pribilofs) were conducted, with assistance by **Sarah Gilman** on St. Paul Island, and **Matt Klostermann** and **McKenna Hanson** on St. George Island.

Black-legged Kittiwake. Photo credit: David Pereksta

Rachael Orben, Alexander Kitaysky (University of Alaska Fairbanks), **Rosana Paredes** (OSU), **Abram Fleishman**, and **Scott Shaffer** (San Jose State University), in collaboration with **Marc Romano** (AMNWR), continued a study of carry-over effects on movements and life-history responses of Red-legged Kittiwakes (*Rissa brevirostris*) at St. George Island, Alaska. In late May and June 2017, Rachael Orben and Abram Fleishman recovered overwinter loggers, and deployed GPS tags and over-winter loggers during pre-lay and incubation, despite complete reproductive failure for the red-legged kittiwakes.

Kathy Kuletz and **Liz Labunski** (USFWS) completed another year of offshore seabird surveys (now spanning 2006 – 2017) in the Bering and Chukchi seas, under a new Interagency Agreement with the Bureau of Ocean Energy Management (BOEM). This program relies on collaborations with a variety of oceanographic and fisheries projects, and now includes the Arctic Integrated Ecosystem Research Program Phase II, funded by the North Pacific Research Board and BOEM. In 2017, seabird observers were placed on 9 Bering or Chukchi research cruises from June to early-October. This was also the second field season of the Arctic Marine Biodiversity Observing Network (AMBON), a five-year program to monitor the Chukchi Sea ecosystem, funded by a consortium of federal agencies and industry. **Dan Cushing** (Pole Star Ecological Research LLC) is conducting analyses for the AMBON surveys. The 2017 seabird observers for Bering/Arctic surveys were **Brian Hoover, Terry Doyle, Liz Labunski, Catherine Pham, Zak Polen, Martin Reedy, Charlie Wright,** and **Tamara Zeller**. Data will be archived in the North Pacific Pelagic Seabird Database. **Kathy Kuletz** and **Liz Labunski** also finalized the final report for the previous five-year project funded by BOEM, available at: https://www.boem.gov/2017-004/

During June to September 2017, the U.S. Fish and Wildlife Service Alaska Region received reports of more than normal dead and dying seabirds from the Bering and Chukchi regions. Specifically, carcasses were observed from Point Hope south to Bristol Bay, with highest onshore counts recorded near Nome. Federal, state, and local agencies as well as the Coastal Observation and Seabird Survey Team (COASST) collaborated to collect information, synthesize records, and send carcasses for necropsies and disease testing to the U.S. Geological Survey (USGS) National Wildlife Health Center and to the USGS Alaska Science Center for harmful algal bloom analysis. Results indicate that birds died of starvation; however, some birds were exposed to saxitoxin via the marine food web but levels detected did not provide clear evidence of acute toxicity as a cause of death.

James Lovvorn and graduate student **Timothy Knudson** of Southern Illinois University (SIU) completed the tenth season of nesting ecology research for the Kittlitz's murrelet (*Brachyramphus brevirostris*; KIMU) on the western end of the Kenai National Wildlife Refuge. This is the final year of field research that started in coordination with Alaska Maritime National Wildlife Refuge, U. S. Geological Survey Alaska Science Center, and Region 7 U. S. Fish and Wildlife Service Office of Ecological Services. The initial five-year plan was to characterize nesting habitat, monitor activities at the nest (incubation shifts, meal delivery to chicks, prey delivered to chicks, etc.), measure chick growth rate, measure reproductive success, and collect samples for genetic analyses. Ongoing analysis at SIU will investigate the influence of diet on nest success, and will assess the hypothesis that the KIMU population has declined in part due to lower chick growth rates resulting from reduced availability of high-energy forage fish. Support was

provided by the USFWS (KNWR and Office of Ecological Services) and the National Fish and Wildlife Foundation.

ALEUTIAN ISLANDS

Annual seabird monitoring at Buldir and Aiktak islands was led by **Nora Rojek** (Alaska Maritime National Wildlife Refuge [AMNWR]) with summer-long field crews. On Buldir, **Kevin Pietrzak**, **McKenzie Mudge** and **Stephanie Walden** collected productivity, diet and population data on a variety of species including Common (*Uria aalge*) and Thick-billed Murres (*U. lomvia*); Parakeet (*Aethia psittacula*), Least (*A. pusilla*), Whiskered (*A. pygmaea*), and Crested (*A. cristatella*) Auklets; Horned (*Fratercula corniculata*) and Tufted Puffins (*F. cirrhata*); Black-legged (*Rissa tridactyla*) and Red-legged Kittiwakes (*R. brevirostris*); and Fork-tailed (*Oceanodroma furcata*) and Leach's Storm-petrels (*O. leucorhoa*). **Sarah Youngren** and **Dan Rapp** at Aiktak Island monitored Common and Thick-billed Murres; Ancient Murrelets (*Synthliboramphus antiquus*); Horned and Tufted Puffins; Glaucous-winged Gull (*Larus glaucescens*); Fork-tailed and Leach's Storm-petrels; and Double-crested, Red-faced, and Pelagic Cormorants (*Phalacrocorax pelagicus, P. urile*, and *P. auritus*).

Nora Rojek also conducted seabird coastline surveys in late July and August in the eastern Aleutians, based off the AMNWR'S research vessel the M/V Tiglax. The surveys included completion of Unalaska Island (started in 2016), as well as all islands east of Unalaska to Unimak Pass (Krenitzin islands). Additional survey crew members included **Jeff Williams** and **Aaron Christ** (AMNWR), **Dean Kildaw, Barry Sampson, Deb Rudis, Judy Alderson**, and **Steve Holtzman** (USFWS).

GULF OF ALASKA

At East Amatuli Island, **Arthur Kettle** (AMNWR) installed time-lapse cameras for season-long monitoring of Black-legged Kittiwake (*Rissa tridactyla*) and Common Murre (*Uria aalge*) breeding success. In August, he, **Rachel Barda**, and **Jaclyn Lucas** surveyed monitoring plots of Fork-tailed Storm-Petrels (*Oceanodroma furcata*) and Tufted Puffins (*Fratercula cirrhata*).

Kathy Kuletz and **Liz Labunski** (U. S. Fish and Wildlife Service) worked with **Dan Cushing** (Pole Star Ecological Research LLC) to conduct offshore seabird surveys and analyses as part of the Long Term Monitoring - Northern Gulf of Alaska project, led by **Russ Hopcroft** (University of Alaska, Fairbanks). This (primarily oceanographic/zooplankton) program has been monitoring the 'Seward Line' and adjacent regions via spring and fall cruises for 20 years, with the USFWS team involved since 2006. In addition, **Kathy Kuletz** partnered with NOAA Alaska Fisheries Science Center and the Exxon Valdez Oil Spill Trustee Council to have **Jessica Stocking** (Prince William Sound Science Center) conduct seabird surveys onboard the NOAA research vessel Oscar Dyson in the northern Gulf of Alaska.

Kathy Kuletz submitted the final report for seabird surveys (funded by BOEM) conducted in conjunction with NOAA and the Kachemak Bay National Estuary Research Reserve in Lower Cook Inlet (authors **Martin Renner, Kathy Kuletz,** and **Liz Labunski**; available at: https://www.boem.gov/2017-011/). The report summarizes surveys conducted 2012-2016, as well as maps of historic seabird data for the region.

Seabird research and monitoring continued on Middleton Island in 2017, conducted by an international team from Canada, France, and the United States. The work was overseen by **Kyle Elliott** (McGill University), **Sarah Leclaire** (Universite Paul Sabatier, Toulouse, France), **Morgan Benowitz-Fredericks** (Bucknell University), **Vicki Friesen** (Queen's University), **Shoshanah Jacobs** (University of Guelph), and **Scott Hatch** (Institute for Seabird Research and Conservation). The Middleton project was fortunate in 2017 to begin collaboration with **Mayumi Arimitsu** and **John Piatt** (U.S. Geological Survey) on long-term monitoring of forage fish in the Gulf of Alaska and Prince William Sound as part of GulfWatch Alaska. Vital funding comes from the Exxon-Valdez Oil Spill Trustee Council. **Scott and Martha Hatch,** joined by **Shawn and Kelly Pummill,** opened the season in early April for spring cleaning, facility maintenance, and camp set-up. The core research team—**Kyle Elliot, Sarah Leclaire, Morgan Benowitz-Fredericks,** camp leader **Shannon Whelan, Josh Cunningham, Anne Moullier, Sidney Collins, Kristen Lalla, Mae Lacey, Drew Sauve, Maxime Pineaux, Ségolène Humann-Guilleminot, Thomas Pagnon, Lucie Abolivier,** and **Camille Toscani** arrived at intervals from late April through June and continued the work through 15 August. In 2017, the team saw a continuation, though possible waning, of conditions dominated by the so-called "warm blob" anomaly in the North Pacific. As in 2016, Black-legged Kittiwakes (*Rissa tridactlya*) had virtually no fish available during April-May, relying instead on invertebrate prey such as copepods and polychaetes. Unusual behavior during chick-rearing, including foraging trips of unprecedented distance and duration, reflected changing conditions in the northern Gulf of Alaska.

PRINCE WILLIAM SOUND

Sam Stark has completed fieldwork for his thesis with **Dan Roby** at Oregon State University. His research, which is funded by the National Fish and Wildlife Foundation and the Exxon Valdez Oil Spill Trustee Council, is part of a long-term effort organized by **David Irons** to restore the nesting populations of Pigeon Guillemot (*Cepphus columba*) in Prince William Sound, Alaska. Sam's project aims to evaluate the effect of removal of introduced mink (*Mustela vison*) on guillemot abundance and nesting success at the Naked Island Group.

ALASKA PENINSULA

Nora Rojek coordinated long-term seabird demography monitoring for Alaska Maritime National Wildlife Refuge [AMNWR] at Chowiet Island, Semidis group, off the coast of the Alaska Peninsula. The summer-long field crew, **Stacie Evans,** and **Dan Schultz**, worked with several species including Common and Thick-billed Murres (*Uria aalge* and *U. lomvia*), Rhinoceros and Parakeet Auklets (*Cerorhinca monocerata* and *Aethia psittacula*), Horned and Tufted Puffins (*Fratercula corniculata* and *F. cirrhata*), Black-legged Kittiwake (*Rissa tridactyla*), Glaucous-winged Gull (*Larus glaucescens*), and Northern Fulmar (*Fulmarus glacialis*).

Rhinoceros Auklet. Photo credit: David Pereksta

WASHINGTON & OREGON

Compiled by Peter Hodum

WASHINGTON

The Marbled Murrelet Effectiveness Monitoring Program continued at-sea surveys for Marbled Murrelets (*Brachyramphus marmoratus*) in 2017 in Washington, Oregon, and California. The goal is to estimate Marbled Murrelet populations and trends and to evaluate the effectiveness of the Northwest Forest Plan in conserving murrelets from the Canada–Washington border to central California. The program has used boat-based transects in the coastal waters of this area since 2000 to monitor murrelets. Other seabird species are also recorded. In 2017, surveys on the outer coast of Washington were led by **Scott Pearson** and **Monique Lance** (Washington Department of Fish and Wildlife) and Oregon and California surveys were led by **Craig Strong** (Crescent Coastal Research). Other contributors to the monitoring program are **Jim Baldwin** and **Nels Johnson** (US Forest Service [USFS]), **Kim Nelson** (Oregon State University), **Deanna Lynch** (USFWS), **Martin Raphael**, **Teresa Lorenz** (USFS), and **Rich Young** (USFWS). Many seasonal technicians made the population surveys possible. **Bill McIver** (USFWS) now coordinates the program.

Martin Raphael, Gary Falxa (USFWS), and **Alan Burger** (University of Victoria) completed a major synthesis of research pertaining to the Marbled Murrelet (*Brachyramphus marmoratus*) in the Northwest Forest Plan area: Raphael, M.G., G.A. Falxa, and A.E. Burger. In press. Chapter 5 – Marbled Murrelet. In: Spies, T.A., Stine, P.A. Synthesis of Science to Inform Land Management Within the Northwest Forest Plan Area. Gen. Tech. Rep. PNW-GTR-XXX. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. **Martin Raphael** and **Teresa Lorenz** also completed an analysis and manuscript on Marbled Murrelet productivity and density data from surveys completed in the San Juan Islands, WA, 1995 to 2012.

Lora Leschner reports that the Pacific Bird Habitat Joint Venture has expanded to include all of the US controlled territories in the Pacific. Partners can now apply for North America Wetland Act grants (NAWCA) plus receive help on habitat protection or restoration projects. See www.pacificbirds.org for more information.

Scott Pearson (Washington Department of Fish and Wildlife), **Tom Good** (National Oceanic and Atmospheric Administration), and **Peter Hodum** (University of Puget Sound and Oikonos) continued their long-term study of reproductive success patterns of Rhinoceros Auklets (*Cerorhinca monocerata*) at Protection (eleventh year) and Destruction (ninth year) Islands, Washington. Dietary studies were conducted during the early and late chick-rearing stages on both islands. Preliminary analyses of burrow occupancy and fledging success suggest that occupancy was comparable to long-term averages at Destruction Island but markedly lower at Protection Island, possibly related to the adult mass mortality event that occurred during the 2016 breeding season. Fledging success on both islands was comparable to long-term averages. Diet on Protection Island was similar to previous years but differed significantly from the historically poor provisioning of 2016. In addition to the Rhinoceros Auklet study, they also expanded their conservation research program on Tufted Puffins (*Fratercula cirrhata*), focusing on mapping of active breeding burrows on Protection, Smith and Destruction islands and breeding season monitoring and foraging ecology of puffins on Destruction Island.

The Coastal Observation and Seabird Survey Team (COASST) had a busy year! Since the fall of 2016 COASST

has documented three unusual mortality events: Rhinoceros Auklets (*Cerorhinca monocerata*) in Puget Sound, Strait of Juan de Fuca and the northern outer coast of Washington; Puffins and Crested Auklets (*Aethia cristatella*) on the Pribilof Islands in the Bering Sea; and Tubenoses (Short-tailed Shearwaters, *Puffinus tenuirostris* and Northern Fulmars, *Fulmarus glacialis*) in the Chukchi and Bering Seas. COASST survey data combined with anecdotal reports documented approximately 950, 350 and 1,200 carcasses respectively for these events. In partnership with tribal, state, federal and NGOs, COASST continues to gather all of the relevant physical and biological data, ranging from records of sea-surface temperature to measures of zooplankton/forage fish abundance and composition, to explore the causal mechanisms of these events and the effects they may be having on breeding population size.

COASST data were used this year in the following publication: Jones, T., Parrish, J.K., Punt, A.E., Trainer, V.L., Kudela, R., Lang, J., Brancato, M.S., Odell, A. and Hickey, B., 2017. Mass mortality of marine birds in the Northeast Pacific caused by Akashiwo sanguinea. Marine Ecology Progress Series, 579, pp.111-127.

Jennifer Lang (Seattle Audubon) is actively managing three community and citizen science programs hosted by Seattle Audubon, including the Puget Sound Seabird Survey (PSSS), a program established in 2007 designed to enumerate wintering seabirds using the nearshore (within 300 m) marine environment in Puget Sound. In 2018, PSSS will be expanding it's range to northern Puget Sound and the San Juan Islands, and will be developing an oil spill response plan thanks to a generous grant from the Environmental Protection Agency through the Washington Department of Fish and Wildlife.

OREGON

U.S. Fish and Wildlife Service (USFWS) wildlife biologists **Shawn Stephensen** and **Mike Szumski** conducted a coastal aerial survey of California Brown Pelicans (*Pelecanus occidentalis californicus*) on 25-26 September 2017. The 2017 survey area included from Smith River, Del Norte County, northern California to Willoughby Rock, Grays Harbor County, central Washington. We included all bays, rocks, reefs, islands, coastal beaches, and waters up to 0.5 mile offshore. The aircraft used was a fixed-wing Cessna 182, FAA registration number N5VE, operated by Inter-State Aviation pilot **Brian Elfers** from Pullman, Washington. Survey flight altitude ranged from 60 to 245 meters above ground level and aircraft speed ranged from 145 to 210 km/h. A Global Positioning System recorded the flight track of the aircraft throughout the entire survey. A total of 3,866 individual pelicans were counted in 2017, in comparison to counts during 2001 to 2016 that resulted in a range of 3,416 to 18,769. Technicians under the direction of **Dan Roby** (Oregon State University [OSU]) counted 2,265 pelicans on East Sand Island from a boat 50-75 meters offshore, whereas USFWS counted 2,300 from the air. East Sand Island continues to be the site of the largest congregation of pelicans during the summer on the Oregon coast.

Shawn Stephensen and **Jennifer Nelson** of the Oregon Coast National Wildlife Refuge Complex conducted an aerial seabird colony survey on 21 and 22 June 2017 that included the entire Oregon coast. The aircraft used was a Bell Jet Ranger III helicopter operated by **Mike Everette** (Northwest Helicopters). Total flight time was approximately 10 hours. All Common Murre (*Uria aalge*), Brandt's Cormorant (*Phalacrocorax penicillatus*), Pelagic Cormorant (*Phalacrocorax pelagicus*), and Double-crested Cormorant (*Phalacrocorax auritus*) colonies were photographed using digital cameras and birds were counted on the digital images utilizing GIS computer software. Thousands of digital images were organized and archived for future reference. Colony attendance by murres was slightly depressed in comparison to previous years; however, murres returned to nest at several historical colony sites (particularly Three Arch Rocks area) that had not been attended the last ten years.

Tim Halloran (USFWS volunteer) and **Shawn W. Stephensen** of the Oregon Coast National Wildlife Refuge Complex conducted a population status assessment of Tufted Puffin (*Fratercula cirrhata*) at Haystack Rock, Cannon Beach which is within the Oregon Islands National Wildlife Refuge. The project also included a pilot study to evaluate the feasibility of monitoring additional reproductive parameters at the island, such as breeding phenology and data collection success from shore-based vantage points. The number of Tufted Puffins present at Haystack Rock was documented during 2010-2017 by conducting instantaneous counts of birds on the land, water, and in the air at 15 minute intervals. The daily mean counts were 42, 33, 13, 35, 22, 21, and 23 birds during 2010, 2011, 2012, 2013, 2014, 2015, and 2016 respectively. Burrow occupancy was determined and the annual breeding population estimate was calculated based on the number of viable occupied burrows. We estimated the Tufted Puffin breeding population (individual birds) at Haystack Rock to be 127 in 2010, 115 in 2011, 92 in 2012, 143 in 2013, 125 in 2014, 121 in 2015, and 124 in 2016. We have not completed 2017 data analysis, however, initial data review indicate 40 to 50 puffins appeared to have nested. We also documented many negative interactions with gulls and disturbances by eagles, as well as interesting social behaviors between puffins.

Joe Liebezeit, Amelia O'Connor (Audubon Society of Portland), and **Jennifer Nelson** (USFWS Intern) conducted a community science seabird monitoring project within the Cape Perpetua and Cape Falcon Marine Reserves. With the help of 26 volunteers, breeding productivity for Brandt's (*Phalacrocorax penicillatus;* BRAC), Pelagic (*P. pelagicus;* PECO),

Brandt's Cormorant. Photo credit: David Pereksta

and Double-crested (*P. auritus;* DCCO) Cormorants and abundance of Rhinoceros Auklets (*Cerorhinca monocerata;* RHAU) and Pigeon Guillemots (*Cepphus columba;* PIGU) were documented. Monitoring sites were in high-use tourist areas, including Heceta Head, Sea Lion Caves and Haystack Rock, where information was provided to the public about Oregon's marine reserves, seabird ecology, and conservation. At Cape Perpetua, five plots (66 nests: BRAC=52, PECO=4, DCCO=10) on five separate cormorant colonies, and RHAU and PIGU counts in the Sea Lion Caves were conducted once a week during the breeding period. Using a 25 day fledging period, 51 chicks (BRAC=30, PECO=0, DCCO=21) fledged from monitored cormorant nests. Sea Lion Cave counts yielded a low estimate of breeding pairs using the cave, 109 individual PIGU adults and 19 individual RHAU adults were the maximum counts. Chicks were rarely sighted, though six different PIGU chicks were observed. At Cape Falcon, 46 cormorant nests (BRAC=17, PECO=16, DCCO=13) in four plots were monitored weekly. These nests fledged 48 chicks (BRAC=18, PECO=10, DCCO=20). For more information on these monitoring results and comparisons to control colonies at Yaquina Head and Haystack Rock see Seabird Colony Monitoring annual reports at http://audubonportland.org/issues/community-science.

The Bureau of Ocean Energy Management (BOEM), Department of the Interior (DOI), and the U.S. Fish and Wildlife Service Pacific Region (USFWS), have completed an agreement to secure proper data management and obtain data synthesis of long-term aerial seabird colony data (photographs) collected at breeding sites surveyed by USFWS Oregon Coast National Wildlife Refuge Complex (OCNWRC) and Washington Maritime National Wildlife Refuge Complex (WMNWRC) along the Oregon and Washington coasts. The specific objectives are: (i) Secure seabird colony count legacy data collected from 1972 to the present by converting film slides to digital images, and cataloging, archiving, and counting birds on aerial images of seabird colonies to estimate colony site populations by species. Slide processing will be conducted by Oregon State University personnel (**Kirsten Bixler** and **Jess Porquez**) under supervision of **Shawn W. Stephensen** and **Erin Stockenberg** (USFWS); (ii) Develop and populate a database that will make data available to the scientific community, the general public, and other government agencies by regular uploading to online portals; and (iii) Provide data products, analyses, and reports that summarize and communicate analyses to BOEM and the general public to support incorporation of marine bird abundance and distribution into planning processes and risk assessment of renewable energy siting and decisions.

Amanda Gladics (OSU)**, Ed Melvin** (Washington Sea Grant)**, Rob Suryan** (OSU)**, Tom Good, Jason Jannot** (NOAA)**,** and **Troy Guy** (Washington Sea Grant) completed their research and outreach project to develop fishery-specific solutions to seabird bycatch in California, Oregon and Washington longline fishery for sablefish (*Anoplopoma fimbria*). Their research findings were recently published in Fisheries Research, and could frame forthcoming policy. The U.S. Fish and Wildlife Service incorporated these findings into a Biological Opinion that will soon trigger new federal regulations to protect the endangered Short-tailed Albatross (*Phoebastria albatrus*) in West Coast longline fisheries. The team will be developing a short outreach publication about the research findings and albatross bycatch avoidance best practices and will distribute it to all sablefish permit holders this winter.

Rob Suryan, **Stephanie Loredo**, **Jane Dolliver**, **Ana Paula Medina Roman**, **Jessica Porquez** (OSU), and **Isabel Justiniano** (Environment for the Americas, Intern) conducted studies of Common Murres (*Uria aalge*) and Pelagic and Brandt's Cormorants (*Phalacrocorax pelgicus* and *P. penicillatus*) at the Yaquina Head colony in Newport, OR. This is the eleventh consecutive year of collaborative studies at this site among OSU, the Bureau of Land Management, and the U.S. Fish and Wildlife Service. For the third consecutive time in the 15-year time series, murres experienced reproductive failure. Reproductive success for murres during the past 6 years (2011-2016; 0-27%) has been greatly reduced compared to prior years (2007-2010; 54-77%).

Rob Suryan, Rachael Orben, Stephanie Loredo, Don Lyons (OSU), and **Josh Adams** (U.S. Geological Survey) continued a project with funding from the Bureau of Ocean Energy Management to use individual tracking to characterize resident and migrant seabird distribution and three dimensional movement patterns during winter, night, and inclement weather for species off Oregon. Stephanie Loredo's MS thesis from this project is titled "Three-dimensional habitat use of common murres off the northern California Current Ecosystem". The project also involves some integration of ship-based surveys. The team tracked Common Murres (*Uria aalge*), Western Gulls (*Larus occidentalis*), and continued to track Pacific Loons (*Gavia pacifica*) with **Joel Schmutz** (USGS). **Shawn Stephensen, Bill Bridgland,** and crew from the Oregon Coast National Wildlife Refuge Complex (OCNWRC, U.S. Fish and Wildlife Service) collaborated in deploying instruments on Common Murres and gulls along the Oregon coast. Western Gulls are being tracked with solar power GPS/GSM tags and gulls are currently still using areas from Cape Mendocino, CA to Willapa Bay, WA. Western Gull studies included collecting bacterial and contaminate samples for a collaboration with **Scott Shaffer, Hillary Young** (U.C. Santa Barbara), and **Corey Clatterbuck** (San Diego State University / U.C. Davis).

Alayna Lawson (OSU Undergraduate), and **Don Lyons** monitored Western Gulls (*Larus occidentalis*) at the Cleft-in-the-Rock colony south of Yachats, Oregon, at the Yaquina Head colony, and on various buildings in Newport, Oregon. Nest success and the average number of fledglings produced per nest were highest on buildings in Newport, with poorest success at Yaquina Head.

Rob Suryan and **Jess Porquez** (OSU) continued coordinating vessel based at-sea surveys of seabird distribution off Oregon. The research areas include the Newport Hydrographic Line, an oceanographic cross shelf sampling line extending west from Newport, Oregon. In collaboration with scientists from the NOAA Northwest and Southwest Fisheries Science Centers and the Farallon Institute, **Michael Force** (Farallon Institute) conducted seabird surveys throughout the southern and northern California Current System.

Rob Suryan, Amanda Gladics, Dan Roby (OSU), **Roberta Swift** (Migratory Birds and Habitat Program, USFWS), **Shawn Stephensen, Bill Bridgeland**, and **Jess Porquez** continued to develop and test non-invasive population monitoring techniques for burrow-nesting seabirds. The approach combines simultaneous data collection using remote cameras and acoustic recorders in long deployments up to an entire breeding season. During 2017, the group deployed equipment at Goat Island, near Brookings, Oregon for a fourth season, and Saddle Island for a second season. This project is in partnership with **Matthew McKown** and **Abram Fleishman** (Conservation Metrics). Analysis comparing and assessing the use of these multiple survey methods at both locations is in progress.

Don Lyons, Kirsten Bixler (OSU)**, Tim Lawes** (OSU), and **Rob Suryan** initiated a pilot effort to create a nest box colony of Pigeon Guillemots (*Cepphus columba*) underneath the ship operations dock at the Hatfield Marine Science Center for education, outreach, and research purposes in 2016. In 2017, a pair of guillemots laid 2 eggs and raised one chick in one of the nest boxes. A live video feed was available (http://webcam.oregonstate.edu/pigu).

Don Lyons and **Renee Albertson** (OSU) continued spring introductory and summer immersive courses on marine and estuarine birds. The fall course on behavior and physiology methods was modified to a hybrid format including a week at Hatfield and then the remainder of the course conducted online. All courses are taught at OSU's Hatfield Marine Science Center in Newport, Oregon, and include several types of experiential learning, such as seabird capture, banding, and tagging, research vessel-based transect sampling, colony visits, beached bird surveys, focal individual behavioral observations, and tracking data analysis.

A protocol framework for Brandt's Cormorants (*Phalacrocorax penicillatus*) and Common Murres (*Uria aalge*) in the California Current System (CCS) was prepared by **Bill Bridgeland** (USFWS), **Nadav Nur** (Point Blue), **Steve Holzman, Roberta Swift** and **Kevin Kilbride** (USFWS) with input from a long list of cooperators, reviewers, and USFWS staff from California, Oregon, Washington, and Alaska, and biologists from British Columbia. Its completion and approval is expected by the end of the 2017. The sampling design will allow both large scale (CCS-wide) and local inference on population trends and distribution of both species. This was the first demonstration project by the USFWS's Pacific Seabird Program, which was recently established to coordinate seabird survey efforts among federal, state, and NGO partners to assess range-wide status and trends for seabirds. **Steve Holzman** (USFWS) was hired as the program's Data Manager and is currently working on a number of priority data management projects, including leading a data management working group to help draft the CCS protocol framework, developing seabird colony catalog online mappers, and identifying and documenting seabird databases to include in a centralized database system planned for development during Fiscal Year 2018.

NORTHERN CALIFORNIA

Compiled by Anna Weinstein

Deborah Jaques (Pacific Eco Logic), **Kyra Mills** (Oiled Wildlife Care Network [OWCN]), **Christine Fiorello** (OWCN), and **Michael Ziccardi** (University of California Davis) completed field work in August 2017 with assistance from citizen scientist, **Barton Selby**, for their study of post-spill survival and field condition of the California Brown Pelican (*Pelecanus occidentalis californicus*) following the 2015 Refugio Beach Oil Spill Incident (RBOS). This study is a companion to an electronic tracking study conducted by OWCN and Clemson University researchers (**Juliet Lamb, Patrick Jodice,** and **Yvan Satge**). Searches for tagged birds took place from Baja California, Mexico to Grays Harbor, WA. More than 50% of the 42 pelicans rehabilitated and released from the RBOS incident were detected alive at non-breeding communal roosts 1-year post spill, and high field encounter rates with color banded post-spill pelicans continued more than 2 years after the spill. Most detections were made in central California at Pillar Point Harbor; several were found as far north as the Columbia River mouth, OR. For the most part, pelicans appeared and behaved like the wild population except for a lag in molt and expression of less gular pouch color approaching the breeding season, possibly indicating lingering spill effects on internal organs. A draft manuscript is in review.

Scott Shaffer and his new student **Cole Jower**, are continuing research with **Russell Bradley, Pete Warzybok**, and **Jamie Jahncke** of Point Blue Conservation Science at the Farallon Islands to examine the foraging and breeding ecology of Western Gulls (*Larus occidentalis*) and Rhinoceros Auklets (*Cerorhinca monocerata*). This research is part of a larger project with **Sue Cockerham, Cleber Ouvnery** (San Jose State University), **Rob Suryan, Leigh Torres, Amanda Gladics, Rachael Orben** (Oregon State University), **Hillary Young** (University of California Santa Barbara), **Josh Adams, Emma Kelsey** (USGS), and **Corey Clatterbuck** (San Diego State University) to compare the foraging ecology of Western Gulls along California and Oregon.

Scott Shaffer and **Greg Taylor** are wrapping up a project with **Josh Ackerman** (USGS) to examine the effects of mercury contamination on the egg attendance behavior of Forster's Terns (*Sterna forsteri*) in San Francisco Bay. Finally, Scott is collaborating with **Olivier Chastel, Pierre Blevin, Henri Weimerskirch, Fredric Angelier,** and **Christophe Barbraud** of Centre National de Recherche Scientifique - Centre d'Etudes Biologiques de Chize (CNRS-CEBC) in France to examine egg attendance behavior and contaminants in high latitude species.

Researchers from H.T. Harvey & Associates, University of California Santa Cruz, Point Blue Conservation Science, Oikonos-Ecosystem Knowledge, National Marine Fisheries Service and National Oceanic and Atmospheric Administration (NOAA)Sanctuaries are synthesizing ~40 years of data on prey availability, seabird diet and population dynamics for Common Murres (*Uria aalge*), Brandt's Cormorants (*Phalacrocorax*

Laysan Albatrosses. Photo credit: David Pereksta

penicillatus), and Rhinoceros Auklets (*Cerorhinca monocerata*) in waters off central California. This project is funded by NOAA. Projects underway include "Environmental conditions and prey-switching by a seabird predator impacts juvenile salmon survival" conducted by **Brian Wells, Jarrod Santora, Mark Henderson, Pete Warzybok, Jaime Jahncke, Russ Bradley, David Huff, Isaac Schroeder, Pete Nelson, John Field,** and **David Ainley**; "Impacts of El Niño on adult Chinook Salmon (*Oncorhynchus tshawytscha*) in the Gulf of the Farallones" conducted by **Pete Adams, David Ainley,** and **Peter Nelson**; "Ecosystem-based management affecting Brandt's Cormorant resources and populations in the central California Current region" conducted by **David Ainley, Jarrod Santora, Phil Capitolo, John Field, Jessie Beck, Ryan Carle, Erica Donnelly-Greenan, Gerry Chesney, Meredith Elliott, Russ Bradley, Kirsten Lindquist, Peter Nelson, Jan Roletto, Peter Warzybok, Michelle Hester,** and **Jaime Jahncke**; and, "Prey switching and consumption by seabirds in the California Current upwelling ecosystem: implications for forage fish management" conducted by **Pete Warzybok, Jarrod Santora, Russ Bradley, David Ainley, John Field, Phil Capitolo, Ryan Carle, Jessie Beck, Meredith Elliott, Gerry McChesney, Michelle Hester,** and **Jaime Jahncke**. H.T. Harvey & Associates, Ecological Consultants, Inc. and Shearwater Expeditions (**Deborah Shearwater**) are summarizing data from 7 major, regional aerial and vessel surveys plus 1,150 citizen science pelagic trips, from 1976-2015, to determine population size and dynamics, and distribution of Ashy Storm-Petrels (*Oceanodroma homochroa*) in the California Current region.

Heather Robinson (Farallon Institute) and **Tori Seher** (National Park Service, Golden Gate National Recreation Area) continued the long-term monitoring of breeding seabird colonies on Alcatraz Island in San Francisco Bay. Favorable ocean conditions and prey availability may have contributed to the highly productive season observed in 2017. Brandt's Cormorants (*Phalacrocorax penicillatus*) were present at the highest level ever observed in the time series and had reproductive success well above the long-term mean (1995-2016). Monitoring of disturbance to the cormorant colony showed the lowest rate of disturbance since 2006, most of which was caused by military aircraft and recreational fisherman in small boats. The Western Gull (*Larus occidentalis*) breeding population declined to low levels, however their productivity was also well above the long-term mean (1999-2016). Pelagic Cormorants (*Phalacrocorax pelagicus*) did not nest on the Island for the fourth consecutive year and the few nesting pairs of California Gulls (*Larus californicus*) were unsuccessful in fledging chicks. Only two Black Oystercatcher (*Haematopus bachmani*) pairs nested on Alcatraz in 2017, down from three pairsthe previous year. Video cameras were used for the third year to monitor reproductive success and diet of Pigeon Guillemots (*Cepphus columba*).

Anna Weinstein (Audubon California) and **Laurie Harvey** (Sutil Conservation Ecology) continued statewide coordination and data management for Black Oystercatcher (*Haematopus bachmani*) productivity studies from Mendocino through San Luis Obispo counties. From 2012-2016, between 50-110 individuals have conducted weekly seasonal surveys tracking nest success (through fledge or failure) of 85-130 pairs of birds. Participating organizations and agencies include several State Park units, the Bureau of Land Management's California Coastal National Monument, Oikonos Ecosystem Knowledge, and four Audubon chapters. Audubon and NGO marine conservation partners at Oceana, Pew Trusts, Earthjustice, and Ocean Conservancy collaborated to protect forage fish including Pacific herring (*Clupea pallasii*) and northern anchovy (*Engraulis mordax*). Audubon and Oceana are formal advisors to the state on for the fishery management plan now in development for Pacific herring in California. Audubon, the Pew Trusts, and other NGOs are collaborating to advocate for precautionary management of northern anchovy on the west coast. Management attention on northern anchovy is ongoing in 2017-2018 at the Pacific Fishery Management Council.

Don Lyons, Adam Peck-Richardson, and **Alexa Piggott** (OSU) joined a large-scale oceanographic research project along the central California coast and deployed prototype telemetry tags on Brandt's Cormorants (*Phalacrocorax penicillatus*) that integrated sensors to measure pressure (depth), temperature, and conductivity (salinity). Dive data were geolocated using Global Positioning System (GPS) technology and transmitted to a database using Global System for Mobile Communication (GSM) technology. This effort was funded by the Office of Naval Research and initial results have provided promising characterization of bathymetry in the region.

SOUTHERN CALIFORNIA

Compiled by André F Raine

Annette Henry continues to work with the National Oceanic & Atmospheric Administration (NOAA) Fisheries' National Seabird Program which is tasked to (1) monitor and reduce seabird bycatch in US Fisheries, (2) support global efforts to reduce seabird interactions with international fisheries, and (3) promote the importance of seabirds as ecosystem indicators as a vital component of healthy ocean habitats. She is continuing to study the migration energetics of Eared Grebes (*Podiceps nigricollis*).

Jeff Davis, Phil Capitolo, Dave Lewis, Peter Gaede, Mike Parker, and **Glenn Ford** (University of California, Santa Cruz; **Breck Tyler**, Principal Investigator) continue to conduct aerial surveys of marine birds and mammals over California continental shelf waters

under contract with **Holly Gellerman** of the California Department of Fish and Wildlife's Office of Spill Prevention and Response. The surveys are designed to collect baseline distribution and abundance data and maintain rapid-response capabilities for oil spills.

HAWAI'I

Compiled by André F Raine

K. David Hyrenbach continues to conduct research at the Pelagicos Lab of Hawaii Pacific University, which involves different aspects of seabird foraging, including the diet, plastic ingestion, stable isotopic levels, and the concentrations of other pollutants in seabird tissues. Pelagicos recently published two papers quantifying plastic ingestion in Hawaiian seabirds via necropsy (Rapp et al. 2017, Marine Pollution Bulletin 123: 269-278) and the dissection of albatross boluses (Hyrenbach et al. 2017, Marine Ornithology 45: 225–236), working with colleagues from the Oikonos – Ecosystem Knowledge, the U.S. Fish and Wildlife Service, the State of Hawaii Department of Fish and Wildlife, and the U.S. Geological Survey. Other research avenues involve ongoing monitoring of Wedge-tailed Shearwater (*Ardenna pacifica*) reproductive success and fallout during the fledging season. Current graduate student projects focus on Red-footed Booby (*Sula sula*) diet (**Sarah Donahue**), Bonin Petrel (*Pterodroma hypoleuca*) plastic ingestion (**Lauren Fraser**), and Christmas Shearwater (*Puffinus nativitatis*) diet and diving behavior.

André Raine, Megan Vynne, Scott Driskill and the rest of the team from the Kaua'i Endangered Seabird Recovery Project (KESRP) continued a number of long running conservation and research programs on the island of Kaua'i, focused on Newell's Shearwater (*Puffinus newelli*), Hawaiian Petrel (*Pterodroma sandwichensis*), and Band-rumped Storm-petrel (*Oceanodroma castro*). Results from a long-term monitoring project using radar were published in Condor (Raine et al. 2017, Condor 119:405-415), revealing a dramatic decline (between 1993 and 2013) of 78% in overall numbers of Hawaiian Petrels and a 94% decline overall in numbers of Newell's Shearwaters. Most (92%) radar sites showed significant declines of Newell's Shearwaters across the entire survey period, as did 62% of sites for Hawaiian Petrels. To counter these declines, a number of conservation initiatives continue to run on Kauai. Long-term predator control and seabird monitoring continues at Upper Limahuli Preserve and five sites in Hono o Na Pali NAR, with intensive cat, rat, pig, and introduced Barn Owl (*Tyto alba*) control. A translocation project for Newell's Shearwater and Hawaiian Petrel entered its third year, with 18 Newell's Shearwater and 20 Hawaiian Petrel being translocated in 2017 from mountain colonies to the predator proof fence at Nihoku (Kilauea Point NWR) as part of a multi-partner project including KESRP, Pacific Rim Conservation, American Bird Conservancy, National Fish and Wildlife Foundation, U.S. Fish and Wildlife Service, Hawaii DLNR (Department of Land and Natural Resources), Pacific Studies Co-operative Unit, and National Tropical Botanical Garden. KESRP also continues to undertake seabird monitoring on Lehua Islet, with annual albatross counts, song meters targeting endangered seabirds and 75 permanent seabird plots focusing on ground nesting seabirds. In conjunction with **Rachel Sprague** of Pulama Lanai, KESRP has also continued in its third year of monitoring the Hawaiian Petrel colonies of the island of Lanai, using a combination of song meters, burrow checks, auditory surveys and burrow cameras. Lastly, as part of its on-going work with Band-rumped Storm-petrels, KESRP obtained blood samples from over 40 storm-petrels captured at a colony on the Na Pali coast as part of a MSc study by **Carmen Antaky** (Research Corporation of the University of Hawaii) to assess genetic differences between Hawaiian island populations. A paper was also published on the breeding phenology of Band-rumped Storm-petrel on Kaua'i and Lehua Islet (Raine et al. 2017, Marine Ornithology 45:73-82).

Marc Travers, Angela Stamen, Adam Elzinga, and **André Raine** (Kaua'i Endangered Seabird Recovery Project) continue to investigate seabird take through power line collisions on Kaua'i. Using acoustic monitoring of power line collisions, direct observations of seabird collisions and dead birds under wires, our data indicate that power line collisions are the single greatest documented source of mortality for Newell's Shearwaters (*Puffinus newelli*) and Hawaiian Petrels (*Pterodroma sandwichensis*) on Kaua'i. Working with funding from the Kaua'i Island Utility Co-operative (KIUC), the team has been developing a number of ways to reduce these collisions, including the creation of laser fences at key collision hot spots (to create a visual barrier for birds to fly over power lines) as well as looking at bird diverters, removal of the top power lines and the potential for relocation or realignment of existing lines. A study using eObs data loggers and downloading stations on both species in mountain colonies was also undertaken to create an understanding of key flight routes, flight heights and timings of arrivals and departures of breeding individuals at colonies to help guide powerline minimization initiatives.

Lindsay Young and **Eric VanderWerf** (Pacific Rim Conservation [PRC]) just completed the third and final year of translocating Laysan Albatross (*Phoebastria immutabilis*) chicks into the predator free area at James Campbell National Wildlife Refuge (JCNWR). The Laysan Albatross translocation was accomplished using eggs laid on a military runway on Kauai that were brought to Oahu, hatched, and then hand-raised at James Campbell National Wildlife Refuge until they fledged. Out of the 50 chicks translocated, 46 successfully

fledged. As part of our new initiative, "no net loss," they are attempting to create equal amounts of predator-free high island habitat to match what is currently being lost to erosion and sea level rise in the Northwestern Hawaiian Islands. This not only involves fencing and predator removal, but bringing species immediately threatened by sea level rise to these new sites. As part of that initiative, in 2017, 15 Black-footed Albatrosses (BFAL, *Phoebastria nigripes*) from Midway Atoll were translocated to JCNWR to create a new high-island colony of the species. The team will continue BFAL translocations for up to four years with the aim of translocating 100 chicks. In 2018, they plan to bring both Bonin Petrels (*Pterodroma hypoleuca*) and Tristram's Storm-petrels (*Oceanodroma tristrami*) to the same site.

PRC continues to work with partners at the Kauai Endangered Seabird Recovery Project, USFWS and the American Bird Conservancy at Kilauea Point National Wildlife Refuge on Kauai. Since 2015, PRC has removed all predators from within a predator proof fenced area and translocated 50 Hawaiian Petrel (*Pterodroma sandwichensis*) chicks and 24 Newell's Shearwater (*Puffinus newelli*) chicks to establish a new, predator-free breeding colony of both species. Translocations at that site are expected to be ongoing for the next five years.

PCR also partnered with Oikonos and the U.S. Marines and will be utilizing social attraction techniques (e.g., decoys and audio) and habitat management to relocate a portion of a Red-footed Booby (*Sula sula*) colony that currently nests inside an active firing range to two areas located outside the impact area of the Kaneohe Bay Range Training Facility. PCR will be working with partners to measure the effectiveness of the social attraction array (through cameras and GPS tracking) and whether birds are visiting the social attraction site. Finally, PCR will continue long-term monitoring and research on Laysan Albatrosses (*Phoebastria immutabilis*) and Wedge-tailed Shearwaters (*Ardenna pacifica*) at Kaena Point Natural Area Reserve on Oahu Island, monitoring and threat control for Red-tailed Tropicbirds (*Phaethon rubricauda*) on Oahu Island, and monitoring nesting success of seabirds on Lehua Islet.

The Save Our Shearwaters (SOS) Program, coordinated by **Tracy Anderson**, handled a total of 474 birds in 2016; 317 of these were seabirds. Of the seabirds, 116 (37%) were individuals listed as threatened or endangered (T&E) species under the Endangered Species Act (ESA) of 1973 and/or the State of Hawai'i's HRS 195D. Of these T&E species, 113 (97% of the listed birds) were Newell's Shearwaters (NESH, *Puffinus newelli*), two were Hawaiian Petrels (*Pterodroma sandwichensis*) and one was a Band-rumped Storm-Petrel (*Oceanodroma castro*). The release rate of all three listed seabirds that were received alive was 93.6%. The Band-rumped Storm Petrel was a recapture - a bird that had been grounded, collected and banded by the SOS program 2 years previously. It had a full brood patch, was in good health and was released the following day. An adult Newell's Shearwater picked up on 27 July 2016 was found to be a recapture banded by the SOS program in 2001 as a fledgling.

Six grounded fledgling NESH that were turned into the SOS program were also fitted with satellite tags as part of a larger study with **André Raine** and **Megan Vynne** of the Kauai Endangered Seabird Recovery Project, that included tagging 6 pre-fledged nestlings and 2 adults from the Upper Limahuli Preserve. The SOS birds chosen were considered "same day" releases that had little to no rehabilitative intervention. All of the fledglings from both study groups headed to the same location southwest of the main Hawaiian Islands. A grounded Hawaiian Petrel (*Pterodroma sandwichensis*) adult that had collided with powerlines was also tracked as part of the same study. The bird spent 5 days in rehabilitative care. After release it was tracked for a period of 159 days in which the bird flew an average of 10,000 km per month.

In mid-July 2017, U.S. Fish and Wildlife Service Region 1 Inventory and Monitoring Program conducted a 3-day workshop in Honolulu with approximately 40 seabird scientists from throughout the U.S. Tropical Pacific (USTP; main HI islands to American Samoa) to support the development of a seabird monitoring manual and gap analysis report; Pacific Rim Conservation is the contractor hired with R1 I&M funds to support the workshop and to develop the gap analysis report and monitoring manual. The gap analysis report included the sites at which seabirds were being monitored, and how they were being monitored so gaps in coverage can be identified by species and site. Two reports, the results of the gap analysis, and a species monitoring protocols manual for seabirds in the USTP (building upon work by Citta et al. 2007) will be finalized in early 2018.

Midway Atoll National Wildlife Refuge biologists **Meg Duhr-Schultz** and **Kelly Goodale** (MANWR, USFWS), **Matthew McKown, Sarah Youngren, Daniel Rapp, Abram Fleishman** (Conservation Metrics) and **Roberta Swift** (Migratory Birds and Habitat Programs, USFWS) completed the final year in a two-year study in 2015 to test acoustic recorders as a survey method for Bonin Petrels (*Pterodroma hypoleuca*) with support from USFWS Refuge Inventory and Monitoring Division. Development of acoustic recorders as a survey tool for Bonin Petrels would enable Refuge staff to more efficiently survey petrels with less damage to burrows and habitat.

Scott Shaffer (San Jose State University) is continuing to study the foraging ecology of Laysan (*Phoebastria immutabilis*) and Black-footed Albatrosses (*P. nigripes*) from Midway Atoll (in collaboration with **Lesley Thorne** of Stony Brook University and **Leigh Torres, Rachael Orben**, and **Rob Suryan** at Oregon State University).

Kathleen Misajon from Hawai'i Volcanoes National Park reports that

Roseate Tern. Photo credit: David Pereksta

Hawaiian Petrel ('Ua'u, *Pterodroma sandwichensis*) monitoring continues for a second season following completion of a cat barrier fence around a major colony. There has been no evidence of cat presence inside, and final nest checks for the 2017 season were conducted in late fall.

Cathleen Bailey from Haleakala National Park (HALE) reports that HALE is continuing its long-term nest monitoring, with final checks in fall 2017. In addition, the park is working on a predator control plan that uses adaptive management and updated trapping techniques.

NON-PACIFIC UNITED STATES

Compiled by Samantha Richman

Jeff Spendelow (U.S. Geological Service [USGS] Patuxent Wildlife Research Center, MD) coordinates cooperative research on the metapopulation dynamics and ecology of the endangered NW Atlantic breeding population of Roseate Terns (*Sterna dougallii;* ROST). After ~35 years of concentrating on colony-site research in the Massachusetts-New York-Connecticut area, since 2011 he has been focusing on temporal and geographic variation in the use of staging sites in the "Cape [Cod] & Islands" area of southeastern MA by Hatch Year (HY) and adult ROSTs (especially non-breeding adults) given 3-character plastic field-readable (PFR) bands at 10 colony sites spanning the entire breeding range from Connecticut to Nova Scotia. Funding from the Cape Cod National Seashore in 2014 and 2015 supported both the long-term "variation in staging site use" work that Jeff has been doing and two MSc. projects by **Melissa Althouse** (State University of New York) and **Kayla Davis** (Virginia Tech University) both of whom are in the process of writing up chapters of their respective theses for publication.

Jeff spent 68 days from mid-July to the end of September conducting fieldwork at 10 sites in 2017. For the first two months he worked mostly by himself, but for the last half of September and the first two weeks of October research assistants **Catherine Neal** and **Ian Putnam** from the American Museum of Natural History's Great Gull Island (GGI) Project also participated in the Staging Site Study research after they had helped band 1600 ROST chicks with PFR bands at GGI. Data are still being received from others, but it is already clear that major changes in the distribution of some species of "forage fish" (especially sand lance, *Ammodytes spp.*) resulted in major changes in the distribution of staging terns in 2017 compared to prior years (with more birds spending more time to the west of Cape Cod, rather than on the outer and northern parts of the Cape), again demonstrating the importance of doing long-term population ecology studies.

Samantha Richman (U.S. Geological Survey, Western Ecosystems Research Center) is currently developing a report on potential restoration actions that will benefit sea ducks injured in coastal oils spills for the Natural Resource Damage Assessment and Restoration Program. The report has compiled the topics discussed during a Special Session at the 6th International Sea Duck Conference held in Tiburon, CA in February 2016. Sam is currently developing a pilot project for San Francisco Bay to enhance food resources for wintering sea ducks.

Richard Veit continues his work with **Lesley Thorne** and **Matthew Fuirst** (Stony Brook University) on foraging and tracking of Herring (*Larus argentatus*) and Great Black-backed Gulls (*L. marinus*) in New York and Massachusetts. With **Lucinda Zawadzki**, now at Oxford, he is studying vagrancy and population growth of Lesser Black-backed Gulls (*L. fuscus*). He is beginning offshore surveys of pelagic birds off North and South Carolina for the Bureau of Ocean Energy Management as a subcontract from the Biodiveristy Research Institute in Maine.

LATIN AMERICA

Compiled by André F Raine

Cristián G. Suazo (Albatross Task Force-Chile) coordinated new experimental trials on novel mitigation measures focused on purse seine fisheries. His focal area of research is southern-central Chile in the Humboldt Current System. In this system, pursuit and plunge diving seabirds such as Pink-

footed Shearwater (*Ardenna creatopus*), Sooty Shearwater (*A. grisea)* and Peruvian Pelicans (*Pelecanus thagus*) overlap with this fishery targeting forage fish. Since 2015, Cristián and colleagues started collaborative field experiments towards the reduction of seabird bycatch in purse seine gear. They carried out comparative fishing sets using control treatments to compare the effect of modifying aspects of the fishing gear on seabird bycatch, such as: (1) excessive quantity of net in the upper section of the gear (producing a net ceiling in which seabirds become trapped during foraging dives), and (2) the mesh around buoy mountings which facilitates neck entanglement. Until the last fishing season in early 2017, controlled sets accounted for ~98% of seabird bycatch reduction compared with sets using control (unmodified) nets. Cristián's work on purse seine fisheries was presented at the ACAP's (Agreement on the Conservation of Albatross and Petrels) Seabird Bycatch Working Group Meeting 8 (SBWG8) in Wellington, New Zealand. These initiatives were possible thanks to the support from the National Fish and Wildlife Foundation and the Royal Society for the Protection of Birds.

Cristián G. Suazo also studied the status of the Waved Albatross (*Phoebastria irrorata*) in Chile and its potential interaction with local fisheries. Other baseline and monitoring studies were related to breeding Black-browed (*Thalassarche melanophris*) and Gray-headed Albatrosses (*Thalassarche chrysostoma*) in Chile. These studies resulted in a number of publications in 2017 in the journals Polar Biology (40: 1035–1042 & DOI: 10.1007/s00300-017-2177-1) Molecular Ecology (DOI: 10.1111/mec.14245) and Revista de Biología Marina y Oceanografía (52: 245–254).

Oikonos continued its long-term seabird conservation and restoration programs in Chile during 2017. On Isla Mocha, **Verónica López** and **Tiare Varela** maintained their long-term collaboration with the park rangers of the Corporación Nacional Forestal to monitor the breeding season of the IUCN-listed Vulnerable Pink-footed Shearwater (*Ardennas creatopus*) as well as document predation by invasive mammals in monitoring plots and with trail cameras. In addition, Oikonos conducted an initial cat trapping campaign in the breeding colonies. On the Juan Fernández Islands, led by local coordinators **Paola González** and **Pablo Manriquez**, the team completed the 15th consecutive season of Pink-footed Shearwater breeding season monitoring. Oikonos is also in the process of redesigning and rebuilding a cattle-proof fence to protect one of the key breeding colonies in the archipelago, within which we are also undertaking active habitat restoration through outplanting of native plant species.

Oikonos Ecosystem Knowledge is currently in the middle of its sixth year of monitoring breeding of the IUCN-listed Vulnerable De Filippi's Petrel (*Pterodroma defilippiana*). In collaboration with multiple Chilean agencies, the BirdLife Albatross Task Force Chile program, and the U.S. Geological Survey (USGS) Western Ecological Research Center, Oikonos is working on fisheries bycatch issues related to Pink-footed Shearwaters, using tracking data, surveys of artisanal and commercial fishers and at-sea observers to assess fisheries overlap and interactions. The reported work also involved **Valentina Colodro, Michelle Hester, David Hyrenbach** (Hawaii Pacific University), **Ryan Carle, Jessie Beck,** and **Peter Hodum**.

Morgan Gilmour (University of California Santa Cruz) is writing her dissertation on the links between foraging ecology and contaminant exposure in seabirds of Mexico and the central tropical Pacific.

CANADA

Compiled by Trudy Chatwin

WESTERN CANADA

Mark Hipfner (Environment and Climate Change Canada, Delta – Wildlife Research Division [ECCC–WRD]) reports that summer 2017 marked the 24th year of operation of the Centre for Wildlife Ecology's seabird research and monitoring program on Triangle Island. The 2017 field crew consisted of **Étienne Boucher** (ECCC Volunteer, Delta) **Glenn Crossin** (Dalhousie University, Halifax), **Alice**

Pink-footed Shearwater. Photo credit: David Pereksta

Domalik (MSc Candidate, Simon Fraser University, Burnaby), **Ana Gonzalez** (University of Saskatchewan, Saskatoon), **Sarah Hudson** (ECCC, Delta–WRD), **Kevin Kardynal** (ECCC, Saskatoon – Wildlife Research Division), **Mark Maftei** (ECCC, Delta–WRD), and **Ken Wright** (ECCC, Delta–WRD), in addition to **Mark Hipfner**. As in past years, the Triangle Island crew monitored breeding chronology, breeding success and diet in Cassin's Auklet (*Ptychoramphus aleuticus*), Rhinoceros Auklet (*Cerorhinca monocerata*), and Black Oystercatcher (*Haemotopius bachmani*). They also deployed satellite tags on Glaucous-winged Gulls (*Larus glaucescens*).

The main focus of the research effort in 2017 (including the work on Triangle) was **Alice Domalik**'s MSc project, co-supervised by **Mark Hipfner** and **David Green** (Simon Fraser University). This project, which started in 2016, involves deploying GPS tags on breeding Cassin's (*Ptychoramphus aleuticus*) and Rhinoceros Auklets (*Cerorhinca monocerata*) on major colonies in British Columbia (BC). In 2017, work on this project (and a final year of recovery of Global Location Sensing (GLS) tags deployed in earlier years) occurred on Triangle, Pine, and Lucy islands, and included members of the Triangle crew (Boucher, Hipfner) plus **Amos Chow** (ECCC, Delta–Canadian Wildlife Service [CWS]), **Philina English** (ECCC Volunteer, Delta), **Andrew Huang** (ECCC, Delta–WRD), **Glen Keddie** (ECCC Contractor, Smithers), **Mason King** (PhD Candidate, Simon Fraser University), **Agathe Lebeau** (ECCC, Delta–CWS), and **Veronica Norbury** (ECCC, Delta – CWS).

Several research projects were carried out concurrently with the logger deployments in 2017. **Mark Hipfner** and **Strahan Tucker** (DFO, Nanaimo-PBS), along with a host of DFO collaborators, completed the sixth year of a project investigating the consumption of salmon (*Oncorhynchus spp.*) by seabirds in BC waters. Hipfner, Tucker and **Moira Galbraith** (Department of Fisheries and Ocean [DFO], Sidney-Institute of Ocean Sciences), along with collaborators in Washington State, completed the eighth year of a project investigating spatio-temporal variation in the diets of Pacific sand lance (*Ammodytes hexapterus*) and Pacific herring (*Clupea pallasii*), two forage fish of vital importance to seabirds in British Columbia. That project is also proving to be useful for monitoring variation in the ingestion of microplastics by forage fish.

Luke Halpin (Halpin Wildlife Research) has been leading a project investigating the migration and year-round movements of Fork-tailed Storm-petrels (*Oceanodroma furcata*) and Leach's Storm Petrels (*O. leucorhoa*) on the west coast of Vancouver Island. Collaborators include **Ingrid Pollet** (Dalhousie University), **Harry Carter** (Carter Biological Consulting), **Christopher Lee** (University of British Columbia, Vancouver), and **Ken Morgan** (CWS, Victoria, BC). Halpin has also been regularly working for the CWS, conducting at-sea seabird surveys in the northeast Pacific to investigate pelagic seabird distribution. In 2018, Halpin is moving to Australia to pursue a PhD at Monash University on the spatial ecology of Pterodroma petrels.

Trudy Chatwin (retired biologist with Province of BC) worked at fulfilling the late **Harry Carter**'s wish to survey all the Double-crested Cormorants (*Phalocrocorax auritus*) in the Strait of Georgia (Canadian section of the Salish Sea). The purpose of the surveys is to contribute to the understanding of Double-crested Cormorant populations and distribution across Western North America in relation to management decisions (especially in relation to cormorant control in the Columbia River estuary and bridge nesting sites in Vancouver). **Mark Drever** (CWS) and **Luke Halpin** (Halpin Wildlife Research) surveyed the Second Narrows Bridge of Vancouver as one of the Pacific Flyway Council long-term monitoring sites and where proposed nesting closure may occur. The Harry Carter Memorial Cormorant Counters included **Briony Penn, Ian Burnett, Ruth Joy, Jeff Shatford, Megan Wille, Marilyn Lambert, Wendy Tyrell, Alison Watt, Nancy Baron, Don Griffiths, Peggy Sowden,** and **Hugh Macdonald** (volunteers). Overall in 2017, the team counted 709 active Double-crested Cormorant nests at five colonies in the Strait of Georgia, which compares to 610 nests at six colonies in 2014. The paper, "Breeding Population Sizes, distribution and trends of Pelagic, Double-crested and Brandt's Cormorants in the Strait of Georgia, British Columbia 1955-2015." by Carter, H.R., Chatwin, T.A. and Drever, M.C. is about to be published this winter in the Northwestern Naturalist.

Biologists (**Monica Mather, Linda Sinclair,** and **Darryn McConkey**) at the Ministry of Forests, Natural Resource Operations and Rural Development BC are working to improve estimates of Marbled Murrelet (*Brachyrhamphus marmoratus*) nesting habitat in BC. This work contributes to the Implementation Plan for Management of Marbled Murrelet in BC, which will hopefully lead to further habitat protection of old-growth nesting habitat.

During the spring and summer of 2017, **Marc d'Entremont, Bryce McKinnon, Jeremy Gatten** (LGL Limited), **Nicole Morven**, and **Bertram McKay** (Nisga'a Lisims Government Fisheries and Wildlife Department) conducted radar surveys for Marbled Murrelet (*Brachyrhamphus marmoratus*) at three drainages within the Lower Nass River watershed, located in northwest BC. They used an X-band radar equipped with a digital interface system that allowed for the collection of digital radar data. Simultaneous dawn audio-visual surveys were conducted on some days at each survey site. A total of 180 Marbled Murrelets were detected at the survey sites prompting further examination of suitable nesting habitat within these drainages. Digital aerial photo imagery at a 1:20,000 scale for the drainages was obtained from **Kimberly Sandve** and **Mansell Griffin** (Nisga'a Lisims Government Lands

and Resources Department) and a 3D stereoscopic visualization was created by **Julio Novoa** (LGL Limited) using PurVIEW. Likely nesting habitat was interpreted by **Marc d'Entremont** and **Nicole Morven** by focusing on forest patches >140 years old and ranking habitat variables including vertical complexity, canopy complexity, tree height, meso-slope, large gaps, small gaps, and crown closure. Patches of suitable nesting habitat were further examined by conducting low-level aerial survey in September 2017. Coast Funds and the Nisga'a Lisims Government supported this work. Overall, the Lower Nass River watershed and lands owned by the Nisga'a Lisims Government were found to contain suitable nesting habitat for Marbled Murrelet. Full study results will be reported this winter.

Laurie Wilson (ECCC–CWS, Delta, British Columbia [BC]) coordinated the Pacific CWS Seabird Colony Monitoring Program in 2017, revisiting permanent plots and assessing occupancy rates at Ancient Murrelet (*Synthliboramphus antiquus*) colonies on George and West Rankine Islands, and Cassin's Auklet (*Ptychoramphus aleuticus*) colonies on East Copper and West Rankine Islands in Gwaii Haanas National Park Reserve and Haida Heritage Site. A pilot study was also conducted to investigate how Audio Recording Units (ARUs) & trail cameras could augment CWS's long term monitoring of population trends of burrow-nesting seabirds. Field crew included: on George and East Copper Islands – **Laurie Wilson, Dan Shervill** (ECCC-CWS, Delta, BC), **Kerry Woo** (ECCC-CWS, Delta, BC), **Glen Keddie** (ECCC-CWS contractor, Smithers, BC); on West Rankine Island – **Dan Shervill, Glen Keddie, Mark Drever** (ECCC-CWS, Delta, BC), **Karen Devitt** (Bird Studies Canada, Delta, BC), **Carita Bergman** (Parks Canada, Queen Charlotte, BC).

Ancient Murrelet (*Synthliboramphus antiquus*) colonies on Jeffrey and East Limestone Islands were surveyed to determine current population estimates and occupancy rates; presence of invasive mammalian species (raccoons, *Procyon lotor*) was noted opportunistically. Ancient Murrelets were our primary species of interest, however, we took the opportunity to survey Cassin's Auklets (*Ptychoramphus aleuticus*), Fork-tailed Storm-petrels (*Oceanodroma furcata*), and Leach's Storm-petrels (*Oceanodroma leucorhoa*) also breeding on the islands. Field crew included: on Jeffrey Island - **Laurie Wilson, Dan Shervill, Kerry Woo, Glen Keddie**; on East Limestone Island – **Dan Shervill, Glen Keddie, Vivian Pattison, Morgan Davies, Jacques Morin, Kalene Lillico,** and **Richard Kennedy** (staff / volunteers with the Laskeek Bay Conservation Society, Queen Charlotte, BC.)

Laurie Wilson continues with her assessment of seabird bycatch in commercial salmon gillnet fisheries. Reports of bird entanglements from DFO test fisheries with observer programs and bycatch events reported by fishers will be tallied; these data will be used to derive seabird bycatch estimates.

Alan Burger (University of Victoria and independent consultant) is mostly retired but continues some work on the Marbled Murrelet (*Brachyramphus marmoratus*) including contracts, reviews, conservation and publishing. He also occasionally works as a naturalist/lecturer in the Antarctic and Arctic. Alan is currently the President of the Federation of B.C. Naturalists (BC Nature).

Louise Blight (Procellaria Research & Consulting) continues as a member of the Birds Specialist Sub-Committee of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). She also began an unmanned aerial vehicle (UAV) study of roof-nesting Glaucous-winged Gulls (*Larus glaucesens*) at Vancouver Island, and is collaborating with **Ed Kroc** (Department of Statistics, University of British Columbia) on his urban gull research elsewhere in British Columbia.

Bernard Schroeder (Bernard K. Schroeder Consulting [BKSC]) conducted an analysis of Marbled Murrelet (*Brachyramphus marmoratus*) radar counts and flight heights from historical data that had not been summarized. This work was done in Toba and Bute Inlet regions of British Columbia for **Douglas Bertram** (ECCC)

Bernard Schroeder (BKSC), **Todd Manning** (Strategic Resource Solutions), and **Paul Chytyk** (Yuni Environmental) updated and re-designed the document and training module, "Guidance and Tools to Support the Identification of Potentially Suitable Marbled Murrelet Nesting Habitat" for **Kerry Woo** (ECCC - CWS). This document was done to prepare for future training workshops and develop a CWS Technical Report.

Bernard Schroeder and **Lisa Bland** (BKSC) conducted Marbled Murrelet (*Brachyramphus marmoratus*) radar and concurrent audio-visual studies for **Louise Waterhouse** of Ministry of Forests, Lands, Natural Resource Operations and Rural Development to monitor commuting behaviours and make a comparison with audio data recorded by Automated Recording Units (ARUs). Surveys were conducted near ARUs in the Tsitika, Klanawa, Capilano and Sooke Lake areas. Bernard also conducted similar radar work near ARUs placed in murrelet nesting habitat on Graham Island of Haida Gwaii.

Bernard Schroeder, **Guy Monty** (BKSC), **Andy Smith,** and **Pablo Jost** (EDI Environmental Dynamics Ltd.) conducted Marbled Murrelet (*Brachyramphus marmoratus*) surveys on Flores Island off the west coast of Vancouver Island to monitor commuting behaviours and flight heights. Surveys used concurrent horizontal and vertically oriented radar to assess collision risk in relation to proposed linear infrastructure. Andy and Bernard also did similar surveys at Bear River and Bitter Creek near Stewart, BC.

Bernard Schroeder, **Ilya Povalyaev** (Golder Associates Ltd., Vancouver BC) and **Ralph Heinrich** (Triton) conducted a Marbled Murrelet (*Brachyramphus marmoratus*) habitat assessment using

low-level aerial surveys near Kitimat, BC.

Bernard Schroeder, **Lisa Bland,** and **Jeremie Hyatt** (BKSC) on S/V Kode Isle conducted Marbled Murrelet (*Brachyramphus marmoratus*) abundance radar surveys for **Kerry Woo** (CWS) at two long-term population trend monitoring locations in the Central Coast Conservation Region with accompanying marine bird surveys between radar stations from Spiller Inlet to Fitz Hugh Sound, BC. They also conducted similar work at three long-term monitoring locations in the Haida Gwaii Conservation Region, BC.

Bernard Schroeder and **Jeremie Hyatt** conducted marine bird survey on transects in the North Coast BC Conservation Region for **Douglas Bertram** (ECCC) on S/V Kode Isle. This work is to assess sensitivities of marine birds and foraging habitats to oiling under the Oceans Protection Plan.

Louise Waterhouse and **Jenna Cragg** of the B.C. Ministry of Forests, Lands, Natural Resource Operations and Rural Development (Nanaimo, B.C.) completed a second year of testing the effectiveness of using automated recording units (ARUs) to sample the vocal activity of Marbled Murrelets (*Brachyramphus marmoratus*) small forest habitat patches. ARUs were deployed on Vancouver Island, Haida Gwaii and in Metro Vancouver Watersheds to sample a range of harvest histories (extent of harvest and time since harvest). Audio-visual and radar surveys were conducted at each cluster of sites to compare with ARU recordings. This research project aims to inform decision-making in B.C. regarding the value of small patches in contributing to critical habitat for the Marbled Murrelet.

Michael Rodway (Wildwing Environmental Research), **Wayne Campbell** (Biodiversity Centre for Wildlife Studies), and **Moira Lemon** (Canadian Wildlife Service, retired) are bringing to fruition many years of work on an updated seabird catalogue for BC entitled "Seabird Colonies of British Columbia: A Century of Changes". The document will be published in serial fashion in Wildlife Afield, the peer-reviewed natural history journal of the Biodiversity Centre for Wildlife Studies in Victoria, BC. The first installment, "Seabird Colonies of British Columbia: A History to 1990, Part 1: Introduction and Provincial Summary", will be published in a dedicated volume of Wildlife Afield over the winter of 2017/2018. This introductory chapter includes sections on the history of survey efforts in BC, survey methods, provincial population summaries, species accounts, threats, and conservation measures. The scientific text is complemented with over 300 photos and other figures, plus numerous anecdotes about nesting species and the experiences of those that have been involved in survey programs in an attempt to make the document attractive and interesting to a wide audience. Approximately 10 regional chapters that present detailed histories through 1990 of every known seabird colony in the province will follow in subsequent issues of Wildlife Afield. The publication is being supported largely through memberships, donations, and the Ronald D. Jakimchuk Foundation for Wildlife and Biodiversity Research. Copies of the journal can be purchased directly and pdfs of the published chapters will later be available online at http://www.wildlifebc.org/.

The Laskeek Bay Conservation Society (LBCS), based in Queen Charlotte, BC, completed their 28th field season (4 May – 22 July) of monitoring marine and terrestrial ecology in Laskeek Bay, Haida Gwaii. **Vivian Pattison** and **Morgan Davies** (LBCS) coordinated the various research and monitoring projects at the field station on East Limestone Island, including Ancient Murrelet (*Synthliboramphus antiquus*) colony monitoring, Pigeon Guillemot (*Cepphus columba*) and Cassin's Auklet (*Ptychoramphus aleuticus*) nestbox monitoring, Glaucous-winged Gull (*Larus glaucescens*) colony censuses, and Black Oystercatcher (*Haematopus bachmani*) surveys. Four boat surveys for seabirds were conducted throughout the season, monitoring trends of at-sea Marbled Murrelets (*Brachyramphus marmoratus*) and other seabirds. Many volunteer and student assistants joined the field staff this season, and there were visits from local school groups and tour groups, who learned about seabird biology, local ecology, and conservation issues. In May, monitoring of Ancient Murrelet chick departures from the Limestone Island colony took place for the 28th consecutive season. Similar to 2015 and 2016, very few chicks were counted leaving this colony. The number of chicks has been declining over time due to severe predation by raccoons (*Procyon lotor*) in the 1990's, and due to windfall in approximately 40% of the colony area. Monitoring for raccoons with remote wildlife cameras now takes place throughout the murrelet breeding season. Wildlife cameras are also being used, along with manual capture, as an alternate method of counting murrelet chicks as they leave the colony, including in the windfall areas. At the end of May, LBCS staff and volunteers were joined by **Dan Shervill** (ECCC-CWS, Delta, BC) and **Glen Keddie** (ECCC-CWS contractor, Smithers, BC) to conduct the first census of the murrelet colony on East Limestone Island in over 10 years. The density of occupied burrows is very low, and the census is now complicated due to the severe windfall in much of the colony area. Black Oystercatcher surveys took place once again this year in Laskeek Bay. LBCS science advisor **Tony Gaston** joined the crew for oystercatcher chick banding and to help determine why, after many years of successful use, eggs were being abandoned in the Pigeon Guillemot nestboxes. Using wildlife cameras, a river otter (*Lontra canadensis*) was observed entering the nestboxes. This was unexpected as the box openings were thought to be too small to allow otters to enter. The boxes will be modified before next season and again monitored with wildlife cameras.

Black Oystercatcher. Photo credit: David Pereksta

CENTRAL CANADA

During summer 2017, **Gail Davoren** of the University of Manitoba continued her focus on the basic ecology of forage fish (primarily capelin, *Mallotus villosus*). Her study looks at how capelin affects the biology of top predators including breeding and non-breeding seabirds at her long-term study site on the north-eastern coast of Newfoundland.

Laura Bliss (University of Manitoba) just started her PhD in fall 2017 and is working to model persistent predator (i.e., seabird, groundfish, and whale) hotspots in Atlantic Canada, using the physical characteristics of demersal capelin spawning habitat.

Paloma Calabria Carvalho (University of Manitoba) is finishing her PhD on the diet, moult, and movement patterns of non-breeding Great (*Ardenna gravis*) and Sooty Shearwaters (*A. grisea*).

Julia Gulka (University of Manitoba) completed her fieldwork for her MSc focusing on individual specialization and plasticity in the foraging behaviour and diet of Common Murres (*Uria aalge*) and Razorbills (*Alca torda*).

Laurie Maynard (University of Manitoba) completed her fieldwork for her MSc examining the foraging behaviour, diet, and habitat use of Great Black-backed Gulls (*Larus marinus*). She is using tracking data, stable isotope analysis along with at-sea predator-prey surveys and experiments to examine Great Black-backed Gull ecology.

Edward Jenkins (University of Manitoba) collected data for his MSc thesis, on the influence of spawning capelin (*Mallotus villosus*), on the foraging ecology of five breeding species: the Atlantic Puffin (*Fratercula arctica*), Razorbill (*Alca torda*), Common Murre (*Uria aalge*), Leach's Storm-petrel (*Oceanodroma leucorhoa*), and Northern Fulmar (*Fulmarus glacialis*), and two non-breeding species; the Great Shearwater (*Ardenna gravis*) and Sooty Shearwater (*A. grisea*), in northeast Newfoundland (NL), using stable isotope analysis, prey sampling, and boat-based observations.

EASTERN CANADA

Carina Gjerdrum of the Canadian Wildlife Service (CWS), Environment and Climate Change Canada (ECCC), has been coordinating pelagic seabird surveys since 2006 to quantify abundance and distribution of birds at sea in Atlantic Canada. The surveys are conducted from both ships and aircraft, and effort extends from the eastern Canadian Arctic to the Gulf of Maine and east across the North Atlantic. The data are used to help understand the threats faced by birds at sea, and current projects include quantifying the risks of offshore oil and gas activities, defining conflict areas between birds and fishing activity, as well as defining bird vulnerability to increased levels of shipping through Canada's Arctic (collaborations with **Francois Bulduc** [ECCC], **April Hedd** [ECCC], and **Sarah Wong** [Acadia University]). In June of 2017, in collaboration with **Ewan Wakefield** (University of Glasgow) and **Rob Ronconi** (CWS), **Holly Hogan** (CWS contractor) led seabird surveys across the Charlie Gibbs Fracture Zone, where the North Atlantic Current crosses the mid-Atlantic ridge, to investigate its importance as a foraging area for both migratory and locally-breeding seabirds from the United Kingdom.

CWS also continues to investigate current declines of Leach's Storm-petrels (*Oceanodroma leucorhoa*) across the region, and deployed 17 GPS tags (with **Ingrid Pollet**, Acadian University) at a colony in Nova Scotia (Country Island) to identify interactions with offshore gas installations, which occur within their foraging range. A study was also initiated from this same location to monitor reproductive success of Black Guillemots (*Cepphus grylle*), and identify their wintering distribution used leg-mounted GLS tags.

Seabird research and monitoring on Machias Seal Island (MSI) in the Bay of Fundy, New Brunswick continued in 2017. **Tony Diamond** (University of New Brunswick [UNB] Fredericton) continued handing over the reins to **Heather Major** (UNB Saint John) who will continue this program in the future. Tony "retired" in 2016 but will continue involvement in research as an Emeritus professor. On MSI, Atlantic Puffins (*Fratercula arctica*) had a much better breeding season than in 2016, fledging from 55% of active burrows (the long-term mean is 57%). Razorbill (*Alca torda*) productivity was the highest since 2004 at 64% (long-term mean is 53%). Several monitored puffin burrows were usurped by razorbills, so habitat competition remains evident in this

crowded colony. New master's students, **Mark Baran** (UNB) and **Mark Dodds** (UNB) deployed GLS tags on puffins (29) and Razorbills (21). Arctic Terns (*Sterna paradisaea*) increased to about 300 pairs and fledged at least 39 chicks from the 87 nests monitored. Egg predation by gulls was higher but was concentrated in peripheral areas away from the intensively monitored plots. Four pairs of Northern Gannets (*Morus bassanus*) built nests. No nests were successful, but the gannets were present throughout the summer. Common Murre (*Uria aalge*) numbers were estimated at above 325 pairs, and ten adults were fitted with GLS tags.

Mark Dodds (UNB) was the Machias Seal Isand supervisor and worked with fellow grad student **Mark Baran** (UNB) and technician **Collette Lauzau**. **Stephanie Symons** (UNB) has almost completed her M.Sc. thesis using GPS tags to track feeding movements by breeding puffins and Razorbills. She found significant overlap of feeding areas, which are concentrated around the colony. However, Razorbills feed in shallower coastal waters and puffins feed in pelagic waters.

Lauren Scopel (UNB) continued her PhD research on causes and consequences of the collapse of the MSI tern colony in 2006 and had an extremely productive year publishing three papers: one assessing the need for lethal control of predatory gulls on seabird colonies in northeastern North America (Scopel, L.C. & Diamond, A.W. 2017. Journal of Wildlife Management 81(4):572-580. DOI: 10.1002/jwmg.21233); the case-history of the collapse of the Arctic tern on MSI (Scopel, L.C. and Diamond, A.W. 2017. Canadian Journal of Zoology. DOI:10.1139/cjz-2016-0281); and, with colleagues in the National Audubon Society's seabird research project, a study of relationships between seabird chick diets and herring fishery data in the Gulf of Maine (Scopel, L.C, Diamond, A.W., Kress, S.W. and Shannon, P. 2017. Canadian Journal of Fisheries and Aquatic Sciences.DOI: 10.1139/cjfas-2017-0140).

Kate Shlepr (University of New Brunswick [UNB]) completed her thesis on tagging Herring Gulls (*Larus argentatus*) breeding at Brier Island, Nova Scotia, and Kent Island, New Brunswick. She explored the use of a combination of stable-isotope signatures and tracking information to assess the relative use of anthropogenic food sources at different colonies and found gulls focusing on mink farms, fish plants and other anthropogenic sources of food. **Lucy Smith** (UNB) continued her MSc research on puffin dispersal in the western North Atlantic adding samples from the Gulf of Maine, Newfoundland, and Labrador. **Tony Diamond** (UNB) chaired a Puffin Symposium at The Waterbird Society annual meeting in Reykjavik, Iceland, in August, which was well attended with speakers from Iceland, Norway, and Memorial University of Newfoundland.

ARCTIC CANADA

Between 20 June and 5 August 2017, a team from Environment and Climate Change Canada (**S. Flemming, J.H. Martin, S. Poole, F. St-Aubin**), the hamlet of Coral Harbour (**J. Nakoolak**) and McGill University (**E. Brisson-Curadeau, K. Elliott, E. Gongora, A Patterson**) visited Coats Island, Nunavut, to monitor the Thick-billed Murre (*Uria lomvia*) and Glaucous Gull (*Larus hyperboreus*) colony. Median hatch date was July 18, the earliest on record. Several projects were completed on: (1) the influence of mercury on the ability of seabirds to adapt to climate change; (2) coupling of camera loggers and accelerometers to identify prey capture events; (3) attachment of year-round depth loggers to examine year-round habitat use and energetics; and (4) association of the faecal microbiome with dietary specialization.

Grant Gilchrist (ECCC-S&T, Ottawa, ON) and **Kyle Elliot** (McGill University, Montreal, QC) lead a team to study Thick-Billed Murres (*Uria lomvia*) at three Arctic colonies in 2016: Coats Island, Digges Island and Cape Graham Moore. Team members included **Isabeau Pratte, Kerry Woo, Bruen Black, Will Black** (ECCC-S&T, Ottawa, ON), **Graham Sorenson** (MSc student, University of Windsor, Windsor, ON), **Thomas Lazarus, Emile Brisson-Curadeau**, and **Tianna Burke** (McGill University, Montreal, QC). Aside from ongoing population monitoring, the team obtained tracks from over 100 individual murres to inform the environmental assessment for the Baffinlands mine that will ship iron ore past those colonies. Although ice conditions were relatively early, the birds bred relatively late with a median hatch date of about July 26 (Coats) and July 28 (Digges). At Coats, a polar bear fed on the colony each night, eliminating at least 10% of the colony before the team left. Apart from the effect of the bear, reproductive success was typical and birds did not forage as exceptionally distant as they did in 2015.

Stephanie Avery-Gomm (University of Queensland, Brisbane, Australia), is continuing work on her PhD which aims to understand spatial and temporal patterns of global seabird populations. In Canada, Stephanie's ongoing research includes documenting marine plastic pollution (Avery-Gomm et al. Mar Pollut Bull, 2017), and understanding the impacts of plastic ingestion on seabirds. She is collaborating with **Jennifer Provencher** (Carleton University, Ottawa, ON), **Max Liboiron** (Memorial University of Newfoundland [MUN], St. John's, NL) and others. This year also marked the publication of a map showing distribution of seabirds in the Labrador Sea with **Dave Fifield** (Environment and Climate Change Canada, Science and Technology Branch, St. John's, NL, Canada), **April Hedd** (ECCC-S&T, St. John's, NL), **Greg Robertson** (ECCC-S&T, St. John's, NL), **Carina Gjerdrum** (ECCC-Canada Wildlife Service, Dartmouth, NS), and **Laura McFarlane-Tranquilla** (Bird Studies Canada, Sackville, NB, Canada; Fifield et al., Front Mar Sci, 4:149, 2017)

ASIA & OCEANIA

Compiled by Kuniko Otsuki

ASIA

Yutaka Watanuki (Hokkaido University, Japan) and his colleagues continued seabird monitoring work at Teuri Island, Hokkaido Japan. In 2017, a few fledgling Rhinoceros Auklets (*Cerorhinca monocerata*; RHAU) were found, slightly better than last two years when shortages of Japanese Anchovy (*Engraulis japonicas*) and Pacific Sand Lance (*Ammodytes hexapterus*) occurred, presumably affecting reproduction. Other monitoring activities that took place over the season included Black-tailed Gull (*Larus crassirostris*) and Japanese Cormorant (*Phalacrocorax capillatus*) surveys. Black-tailed Gulls established a new breeding area, while breeding locations of cormorants remained unchanged. The Ministry of the Environment has been protecting seabird breeding area at Teuri Island and cats are being controlled through removals. **Akiko Shoji** has been continuing a study of biotransport by RHAU and **Kentaro Kazama** has been developing protocols for evaluating wind turbine effects on Black-tailed Gulls at Rishiri Island and Esashi-cho, Hokkaido. **Bungo Nishizawa** has completed boat surveys of seabirds in the Arctic Ocean-Bering Sea. **Akinori Takahashi** (National Institute of Polar Research), collaborating with **Yasuaki Niizuma** (Meijo University, Japan) and **Sasha Kitaysky** (University of Alaska, Fairbanks), has been continuing a project on physiological carry-over effects using RHAU.

On 18-19 March 2017, the 2017 Japanese Murrelet (*Synthliboramphus wumizusume*) symposium was held in Kadogawa-cho Miyazaki Prefecture, Japan. The Marine Bird Restoration Group (MBRG) assisted as supervisors. PSG members **Kuniko Otsuki** (MBRG), **John Piatt** (U.S. Geological Surveys), **Darrell Whitworth** (California Institute Environmental Studies), **Nina Karnovsky** (Pomona University), and **Kim Nelson** (Oregon State University) were invited and gave talks. **Harry Carter** (Carter Biological Consulting) was in Japan on 14-26 March to participate in the symposium, but he decided to stay in Fukuoka Prefecture due to severe pain in his knee and back. The symposium was very successful. For the scientific session (18 March), there were a total of 154 participants and speakers representing four countries: Japan, United States, Canada, and South Korea. The general public session (on the 19th) had 116 participants. In the public session people learned what the Japanese Murrelet is, where they go after the breeding season, the threats that they face, why we need to monitor them, and how to monitor.

In the technical meeting, part of the symposium, scientists discussed development of a standardized protocol for one monitoring method, the spotlight survey. Unfortunately, we were unable to settle on a single basic method for the spotlight survey. However, we at least agreed on the necessity of establishing a common survey protocol that can be used by all Japanese Murrelet research groups, which would allow us to compare population estimates at different colonies from the results of spotlight surveys. We thank the Kadogawa government for supporting the symposium.

Kuniko Otsuki and **Harry Carter** were co-coordinators of the booklet project sponsored by Lush Japan Charity Bank. The booklet titled "Status and Monitoring of Rare and Threatened Japanese Crested Murrelet" published on 4 October 2017. This booklet provides a summary of the conclusions reached at the 2017 Japanese Murrelet symposium, including the status of the Japanese Murrelet, and our plans for future tasks. We include only one observation from the Kaminoseki area (Yamaguchi Prefecture), where the murrelets are facing a nuclear power plant issue. The booklet will be useful for both scientists and the public who are seeking more information about the Japanese Murrelet. We dedicate this booklet to the late **Harry Carter** (17 January 1956 – 30 April 2017), who loved Japanese Murrelets and Japan very much. His 23-year old dream "to hold a meeting for the conservation of Japanese Murrelets" finally came true. Furthermore, we will continue to work for many years on important tasks for protecting this rare species. Harry's legacy will continue to be handed down from now into the future.

Simba Chan (BirdLife International [BLI] Asia Division) reports that the National Institute of Ecology (NIE) of Korea has been conducting surveys of seabirds in southwestern islands of the country since 2014. On 26 April 2016 our surveyors first discovered one breeding pair of Chinese Crested Terns (*Thalasseus bernsteini*) incubating eggs in a colony of Black-tailed Gulls (*Larus crassirostris*). At the end of the season, two pairs of Chinese Crested Terns were found but only one pair had breeding success (a single chick). This discovery was significant because Chinese Crested Terns were highly socialized breeders but it was previously assumed they could only form colonies within colonies of their own species or very closely related species, the Great Crested Tern (*T. bergii*). This breeding behavior had been observed at all known breeding colonies until this unique discovery in Korea. Breeding of Chinese Crested Tern was confirmed again at the same site in Korea in 2017, with six birds visited the same island and two breeding pairs formed. One chick was successfully fledged. The NIE Korea is considering deploying social attraction devices to the island in 2018.

Jane Dolliver, Rob Suryan (OSU)**, Chris Noyles** (BLM), and **Leah Kenney** (USFWS) finished their second field season "Viewing Albatrosses from Space: Using Satellite Imagery to Count Birds" which paired albatross colony ground counts with satellite image analysis to test the feasibility of estimating breeding colony size from satellite imagery. Ground based calibration sites included Kaena Point, Oahu (**Lindsay Young** and **Eric VanderWerf** [Pacific Rim Conservation]), Midway Atoll (**Meg**

Duhr-Schultz, Jenny and Richard Johnson, USFWS), and Torishima (**Hiroshi Hasegawa**, Toho University, retired, Fumio Sato, Yamashina Institute for Ornithology). The initial application of this project is to conduct breeding population counts of Short-tailed Albatross (*Phoebastria albatrus*) at the Senkaku Islands, which are inaccessible to biologists, yet critical in determining whether the species is meeting recovery criteria. Secondarily, results from advanced image processing techniques may provide other albatross colony sites with additional options for annual censuses.

Rob Suryan (OSU) continued collaborations on Short-tailed Albatross (*Phoebastria albatrus*) studies with **Kiyoaki Ozaki, Fumio Sato**, and **Tomohiro Deguchi** (Yamashina Institute for Ornithology) with a focus on monitoring translocated and hand-reared bird recruitment and breeding attempts at the new colony, as well as data analyses and manuscript preparation to fully document the translocation project.

OCEANIA

Stephanie Avery-Gomm (University of Queensland, Brisbane, Australia) is continuing work on her PhD which aims to understand spatial and temporal patterns of global seabird populations. In January, she joined the Seabird Working Group of the East Asian Australian Flyway Partnership (SWG-EAAFP). The SWG identified terns as a species-group that unites the flyway and resolved to develop information sheets with breeding, distribution and conservation relevant information. Stephanie, **Robb Kaler** (USFWS, Alaska, USA), **Mark Cary** (Australian Department of the Environment and Energy, Canberra, Australia), **Simba Chan** (BirdLife International (BLI) Asia Division), and **Mayumi Sato** (BLI Asia Division) are currently working beginning with five species: Fairy Tern (*Sternula nereis*), Roseate Tern (*Sterna dougallii*), Aleutian Tern (*Onychoprion aleuticus*), Chinese Crested Tern (*Thalasseus bernsteini*) and Little Tern (*Sternula albifrons*).

Caitie Kroeger and **Scott Shaffer** continue to collaborate with **David Thompson** and **Paul Sagar** of the National Institute of Water and Atmospheric Research in New Zealand, and **Leigh Torres**. **Caitie Kroeger** is studying the foraging ecology and energetics of two albatross species at Campbell Island in New Zealand.

EUROPE & AFRICA

Compiled by Ross Wanless

Paulo Lago, Martin Austad (BirdLife Malta), and **Steffen Oppel** (Royal Society for the Protection of Birds, Cambridge, UK) PIT-tagged hundreds of Yelkouan Shearwaters (*Puffinus yelkouan*) to assess whether colony activity patterns in Malta are related to light pollution by ships anchoring in the vicinity of the colony. The team also deployed acoustic recorders during the breeding season to record calling activity and estimate the size of breeding populations in inaccessible sea caves.

Annalea Beard and the Marine Section of the Environmental Management Directorate (St. Helena Government), and **Steffen Oppel** initiated a demographic analysis of Masked Boobies (*Sula dactylatra*) nesting on St. Helena to examine whether recent colony growth on St. Helena may be due to immigration of birds from Ascension, where a cat eradication in 2002 has benefitted seabird populations.

Maria Dias, Ana Carneiro (BirdLife International, Cambridge, UK), and **Steffen Oppel** have collated seabird tracking data from across all British Overseas territories to quantify the space use of seabirds in 10 different seabird families. The project is intended to provide guidance on the policy mechanism that may be most suitable to protect the marine habitat of seabird species depending on the foraging range and spatial aggregation at sea.

CIRCUMPOLAR

In May 2017 the Arctic Council Ministerial, via the Conservation of Arctic Flora and Fauna (CAFF), officially released the 'State of the Arctic Biodiversity Report' (SAMBR), which includes a section on seabirds compiled by the Circumpolar Seabird Group (an Arctic Council Expert Network), now available at: https://arcticbiodiversity.is/marine

ANTARCTICA

Peter Kappes is working on a PhD with his adviser, **Katie Dugger**, at Oregon State University, investigating the reproductive ecology and population dynamics of Adélie Penguins (*Pygoscelis adeliae*) breeding on Ross Island, Antarctica.

GLOBAL

Joanna Smith (The Nature Conservancy [TNC Canada]) continues to work on marine spatial plans (MSP) around the world, identifying marine protected areas for marine species, communities and habitat conservation objectives, as well improved management for marine sectors and marine plans that address climate change adaptation. On behalf of the government of Seychelles, she is currently leading the process for a marine spatial plan to identify 400,000 sq. km of new marine protected areas and improve ocean management for the entire 1.37 million sq. km Exclusive Economic Zone. This project is in support of their Blue Economy (primarily fisheries and tourism) and to address climate change threats. Seychelles has several globally significant populations of seabirds including Great (*Fregata minor*) and Lesser Frigatebirds (*F. ariel*), and some of the world's largest colonies of Sooty Terns (*Oncyoprion fuscatus*). The Seychelles Debt Swap and Marine Spatial Plan project won the Boat International

2017 Ocean Award for Innovation, and also received The Nature Conservancy's 2017 Conservation Award. In the past year, Jo has been participating in several international discussions to advance the field of marine spatial planning and improve global best practices. These include the 2nd International IOC-UNESCO MSP (Intergovernmental Oceanographic Commission [IOC] United Nations Educational, Scientific and Cultural Organization [UNESCO] conference in Paris and the UN Oceans Conference in New York. Jo is supporting the implementation of the Marine Plan Partnership for the North Pacific Coast (MaPP) in British Columbia, working with the management and technical teams to produce a special issue for Marine Policy on the MaPP process and outputs (2011-2014). Finally, Jo has been supporting the World Bank's Ocean Economy 'Economic Sector Work' project in Mauritius, identifying enabling conditions for marine spatial planning and proposing models for MSP to address their needs for planning and conservation. In 2017, Jo supported or provided advice to several other marine planning processes or initiatives around the world including in Indonesia, Mexico, the Caribbean, and the Canadian Arctic.

TREASURER'S REPORT FOR 2017

Kirsten Bixler

Pacific Seabird Group's Fiscal Year 2017 (FY2017) ran from 1 October 2016 to 30 September 2017. The FY2017 budget was approved by the Executive Council on 19 May 2017 and a draft budget was in operations from 30 September 2017 until this date. FY2017 posted a deficit of $18,998.71, which will be mostly recovered in FY2018. The reason for the deficit was as follows: (1) Funds were not transferred from PSG's Endowment Fund during FY2017 to cover publication costs for Marine Ornithology ($10,000) and Pacific Seabirds ($1,649.93). These funds were withdrawn from the endowment fund in FY2018; and (2) The on-line registration software was changed from RegOnline to Cvent during FY2017 because RegOnline was being bought by Cvent. Fees associated with using the software for registration for two PSG annual meetings were charged to PSG during FY 2017. These two issues account for $17,744.93 in loss. The remaining $1,253.78 deficit and the complete summary of PSG's financial accounts are provided on the following pages.

TREASURER'S REPORT FOR 2017

FY17 ACTUAL INCOMES AND EXPENDITURES

Financial Accounts

PSG maintains a number of accounts to allow the organization to fulfill its mission.

REGULAR CHECKING ACCOUNT

PSG policy requires 3 years' worth of unrestricted operating funds be kept in the checking account.

September 30, 2011	$102,079.24
September 30, 2012	$88,173.87
September 30, 2013	$79,506.16
September 30, 2014	$50,663.75
September 30, 2015	$68,154.50
September 30, 2016	$52,164.86
September 30, 2017	**$44,027.81**

ENDOWMENT FUND

Our Endowment funds are kept in a mutual fund managed by Neuberger and Berman and are restricted funds.

September 30, 2011	$119,879.53
September 30, 2012	$146,197.30
September 30, 2013	$180,320.39
September 30, 2014	$206,824.23
September 30, 2015	$181,268.22
September 30, 2016	$200,190.51
September 30, 2017	**$237,195.93**

PAYPAL

A PayPal account is used to accept membership dues, annual meeting registration, and donations but are part of the general fund. Funds are transferred into and out of the PayPal account as needed (e.g. student award donation is transferred to the student award account).

September 30, 2011	$15,100.28
September 30, 2012	$5,882.93
September 30, 2013	$7,132.73
September 30, 2014	$2,555.26
September 30, 2015	$8,072.97
September 30, 2016	$10,560.16
September 30, 2017	**$450.65**

STUDENT AWARD

Student travel awards are kept in a savings account and are restricted funds.

September 30, 2013	$5,216.24
September 30, 2014	$2,784.99
September 30, 2015	$2,906.21
September 30, 2016	$3,094.55
September 30, 2017	**$3,096.10**

CRAIG HARRISON CONSERVATION FUND

The Conservation fund is kept in a savings account and are restricted funds.

September 30, 2013	$12,346.95
September 30, 2014	$3,342.88
September 30, 2015	$6,507.23
September 30, 2016	$7,235.43
September 30, 2017	**$8,114.31**

Total Assets as of September 30, 2016	$273,245.50
Total Assets as of September 30, 2017	**$292,884.80**

REPORTS OF PSG OFFICERS

FY17 ACTUAL INCOMES AND EXPENDITURES

A. INCOME	**Budgeted**	**Actual (as of 9/30/17)**	**Surplus/-Loss**
Unrestricted:			
Membership (annual regular, student):[1]	$9,415.00	$12,620.00	$3,205.00
General Fund Donations	$5,000.00	$748.46	-$4,251.54
Annual Meeting:			
Tacoma 2017	$107,533.00	$74,903.31	-$32,629.69
Student travel (*Restricted*)	$2,900.00	$1,256.13	-$1,643.87
Meeting sponsorships[2]		$8,895.00	$8,895.00
Restricted:			
Publications[3]	$10,000.00	$30.00	-$9,970.00
Lifetime Memberships		$540.00	$540.00
Conservation Fund Donations[4]		$4,328.85	$4,328.85
A. TOTAL INCOME:	**$145,528.00**	**$142,865.74**	**-$2,662.26**
B. EXPENSES: Administrative Operations	**Budgeted**	**Actual (as of 9/30/17)**	**Underspent/ -Overspent**
Chairs Discretionary Fund	$2,000.00	$1,504.60	$495.40
Insurance premium	$1,500.00	$1,400.00	$100.00
Online Services:			
Website/Email hosting	$50.00	$35.76	$14.24
Listserv	$300.00	$299.88	$0.12
Survey Monkey	$300.00	$185.00	$115.00
QuickBooks online	$120.00	$489.91	-$369.91
Website transition and maintenance services (Anne Francis)	$1,200.00	$2,322.80	-$1,122.80
Operations:			
Postage	$50.00	$44.64	$5.36
Telephone	$500.00	$455.95	$44.05
Office supplies	$30.00	$7.38	$22.62
USPS PO Box Rental	$0.00	$0.00	$0.00
Professional services:			
Accountant	$1,000.00	$0.00	$1,000.00
Bookkeeper	$1,500.00	$6,181.67	-$4,681.67
Audit	$0.00	$0.00	$0.00
Legal[5]	$1,000.00	$0.00	$1,000.00
Service fees:			
PayPal Fee	$700.00	$379.81	$320.19
RegOnline Fee/Cvent Fee[6]	$2,500.00	$8,440.40	-$5,940.40
Bank Fees	$300.00	$135.00	$165.00

FY17 ACTUAL INCOMES AND EXPENDITURES

Government Registration Fees	$50.00	$50.00	$0.00
B. TOTAL ADMINISTRATIVE OPERATIONS EXPENSES:[7]	**$15,600.00**	**$19,460.29**	**-$3,860.29**
C. EXPENSES: Society Services (meetings, publications, support)	**Budgeted**	**Actual (as of 9/30/17)**	**Underspent/ -Overspent**
Annual Meeting: Tacoma, WA			
Conference venue, food, etc. -- Local Committee's budget[8]	$110,000.00	$117,807.94	-$7,807.94
Compilation of scientific program	$1,000.00	$1,170.53	-$170.53
Student travel[9]	$3,000.00	$2.756.00	$244.00
Student travel awards (augmented from PSG GF and grants)	$0.00	$1,194.00	-$1,194.00
Foreign scientist travel (non US/Canadian)	$2,500.00	$670.00	$1,830.00
Conservation grants		$4,000.00	-$4,000.00
Dues and Subscriptions:			
Ornithological Council	$2,120.00	$2,060.00	$60.00
Publications:			
Marine Ornithology (layout, printing, mailings)[10]	$6,000.00	$6,095.76	-$95.76
Marine Ornithology website	$4,000.00	$4,000.00	$0.00
Pacific Seabirds (layout, editor, website)	$2,000.00	$1,500.00	$500.00
InDesign Subscription	$180.00	$149.93	$30.07
C. TOTAL SOCIETY SERVICES EXPENSES:	**$130,800.00**	**$142,404.16**	**-$11,604.16**
D. PSG BUDGET SUMMARY			
TOTAL INCOME (A)	$145,528.00	$142,865.74	-$2,662.26
TOTAL EXPENSES (B + C)	$146,400.00	$161,864.45	-$15,464.45
RESULT: SURPLUS/-LOSS	-$872.00	-$18,998.71	-$18,126.71

[1] Life membership income is not included (restricted to the Endowment Fund)

[2] Actual does not include $5,000 in sponsorships paid during FY2016

[3] Funds for publications (Marine Ornithology and Pacific Seabirds) are derived from Endowment Fund. No funds were transferred during the fiscal year

[4] New budget item. Includes $3,700 for a refunded conservation grant

[5] Legal fee for Code of Conduct review invoiced in FY2018

[6] For RegOnline, includes fees for managing membership, site maintenance, and related credit card transactions but does not include meeting-related fees. RegOnline fees associated with the meeting are included in meeting expenses. For Cvent, includes $6,095 startup fee for FY2018 meeting

[7] This is the amount for PSG's operating expenses

[8] Includes RegOnline fees for meeting-related transactions ($7,102.95). Does not include $5,667 of expenses paid in FY2016 but does include $630 for 2018 meeting logo paid in FY2017

[9] Actual student travel expense equal to amount of student travel income generated in FY2016

[10] Actual expense includes $95.76 in page fees owed to Marine Ornithology from FY2015

PUBLICATIONS OF THE PACIFIC SEABIRD GROUP

The Pacific Seabird Group publishes symposia and other works. PSG Symposia are occasionally held at Annual Meetings; those which have been published are listed below. Technical Reports prepared by PSG working groups are also listed. To order one of these PSG publications, please see instructions after each item. Abstracts of papers and posters given at PSG meetings are published annually. Abstracts for meetings of 1974 through 1993 appeared in the PSG Bulletin (Volumes 2-20); for meetings of 1994 through 2003, in Pacific Seabirds (Volumes 21-30); and for meetings of 1997 and later, at www.pacificseabirdgroup.org. PSG publishes the on-line bulletin Pacific Seabirds (www.pacificseabirdgroup.org) and the journal Marine Ornithology (www.marineornithology.org). Current and past issues of both journals are available online.

SYMPOSIA

SHOREBIRDS IN MARINE ENVIRONMENTS. Frank A. Pitelka (Editor). Proceedings of an International Symposium of the Pacific Seabird Group. Asilomar, California, January 1977. Published June 1979 in Studies in Avian Biology, Number 2**.** ***Available free of charge at*** http://elibrary.unm.edu/sora/Condor/cooper/sab.php

TROPICAL SEABIRD BIOLOGY. Ralph W. Schreiber (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Honolulu, Hawaii, December 1982. Published February 1984 in Studies in Avian Biology, Number 8. ***Available free of charge at*** http://elibrary.unm.edu/sora/Condor/cooper/sab.php

MARINE BIRDS: THEIR FEEDING ECOLOGY AND COMMERCIAL FISHERIES RELATIONSHIPS. David N. Nettleship, Gerald A. Sanger, and Paul F. Springer (Editors). Proceedings of an International Symposium of the Pacific Seabird Group, Seattle, Washington, January 1982. Published 1984 as Canadian Wildlife Service, Special Publication. Out of print; ***available free of charge at*** www.pacificseabirdgroup.org

THE USE OF NATURAL VS. MAN-MODIFIED WETLANDS BY SHOREBIRDS AND WATERBIRDS. R. Michael Erwin, Malcolm C. Coulter, and Howard L. Cogswell (Editors). Proceedings of an International Symposium at the first joint meeting of the Colonial Waterbird Society and the Pacific Seabird Group, San Francisco, California, December 1985. Colonial Waterbirds 9(2), 1986. $12.00. Order from: Ornithological Societies of North America, PO Box 1897, Lawrence, Kansas 66044; phone (800) 627-0629; no online orders.

ECOLOGY AND BEHAVIOR OF GULLS. Judith L. Hand, William E. Southern, and Kees Vermeer (Editors). Proceedings of an International Symposium of the Colonial Waterbird Society and the Pacific Seabird Group, San Francisco, California, December 1985. Published June 1987 in Studies in Avian Biology, Number 10. $18.50. ***Available free of charge at*** http://elibrary.unm.edu/sora/Condor/cooper/sab.php

AUKS AT SEA. Spencer G. Sealy (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Pacific Grove, California, December 1987. Published December 1990 in Studies in Avian Biology, Number 14. ***Available free of charge at*** http://elibrary.unm.edu/sora/Condor/cooper/sab.php

STATUS AND CONSERVATION OF THE MARBLED MURRELET IN NORTH AMERICA. Harry R. Carter and Michael L. Morrison (Editors). Proceedings of a Symposium of the Pacific Seabird Group, Pacific Grove, California, December 1987. Published October 1992 in Proceedings of the Western Foundation of Vertebrate Zoology, Volume 5, Number 1. $20.00. Available free of charge at www.pacificseabirdgroup.org

THE STATUS, ECOLOGY, AND CONSERVATION OF MARINE BIRDS OF THE NORTH PACIFIC. Kees Vermeer, Kenneth T. Briggs, Ken H. Morgan, and Douglas Siegel Causey (editors). Proceedings of a Symposium of the Pacific Seabird Group, Canadian Wildlife Service, and the British Columbia Ministry of Environment, Lands and Parks, Victoria, British Columbia, February 1990. Published 1993 as a Canadian Wildlife Service Special Publication, Catalog Number CW66-124 1993E. ***Order free of charge from:*** Publications Division, Canadian Wildlife Service, Ottawa, Ontario, K1A OH3, Canada

PUBLICATIONS OF THE PACIFIC SEABIRD GROUP

BIOLOGY OF MARBLED MURRELETS—INLAND AND AT SEA. S. Kim Nelson and Spencer G. Sealy (Editors). Proceedings of a Symposium of the Pacific Seabird Group, Seattle, Washington, February 1993. Published 1995 in Northwestern Naturalist, Volume 76, Number 1. $12.00. ***Available free of charge at*** www.pacificseabirdgroup.org

BEHAVIOUR AND ECOLOGY OF THE SEA DUCKS. Ian Goudie, Margaret R. Petersen and Gregory J. Robertson (editors). Proceedings of the Pacific Seabird Group Symposium, Victoria, British Columbia, 8-12 November 1995. A special publication compiled by the Canadian Wildlife Service for the Pacific Seabird Group. Published 1999 as Canadian Wildlife Service Occasional Paper number 100, catalog number CW69-1/100E. Order free of charge from: Publications Division, Canadian Wildlife Service, Ottawa, Ontario, K1A OH3, Canada, or ***available free of charge at*** www.pacificseabirdgroup.org

SEABIRD BYCATCH: TRENDS, ROADBLOCKS AND SOLUTIONS. Edward F. Melvin and Julia K. Parrish (editors). Proceedings of an International Symposium of the Pacific Seabird Group, Blaine, Washington, 26-27 February 1999. Published 2001 by University of Alaska Sea Grant, Fairbanks, Alaska. Publication no. AK-SG-01-01. $40.00. ***Order from publisher***.

BIOLOGY, STATUS, AND CONSERVATION OF JAPANESE SEABIRDS. Yutaka Watanuki, Harry R. Carter, S. Kim Nelson and Koji Ono (conveners) and Nariko Oka (editor). Proceedings of an International Symposium of the Japanese Seabird Group and Pacific Seabird Group, Lihue, Hawaii, February 2001. Journal of the Yamashina Institute of Ornithology 33(2); Symposium (5 papers), pp 57-147, other papers pp. 148-213. In English with Japanese abstracts. $75.00. ***Order from PSG*** - contact the Chair at Chair@pacificseabirdgroup.org

OIL AND CALIFORNIA'S SEABIRDS. Harry R. Carter (convener) and Anthony J. Gaston (editor). Proceedings of a Symposium of the Pacific Seabird Group, Santa Barbara, California, February 2002. Published 2003 in *Marine Ornithology* 31(1). ***Available free of charge at*** www.marineornithology.org

THE BIOLOGY AND CONSERVATION OF THE AMERICAN WHITE PELICAN. Daniel W. Anderson, D. Tommy King, and John Coulson (editors). Proceedings of a Symposium of the Pacific Seabird Group. *Waterbirds*, Volume 28. Special Publication 1, 2005. Published by the Waterbird Society. $15.00. ***Order from PSG*** - contact the Chair at Chair@pacificseabirdgroup.org.

BIOLOGY AND CONSERVATION OF XANTUS'S MURRELET. Harry R. Carter, Spencer G. Sealy, Esther E. Burkett, and John F. Piatt (editors). Proceedings of a symposium of the Pacific Seabird Group, Portland, Oregon, January 2005. Published 2005 in *Marine Ornithology* 33(2):81-159. ***Available free of charge at*** www.marineornithology.org

SEABIRDS AS INDICATORS OF MARINE ECOSYSTEMS. John F. Piatt and William J. Sydeman (editors). Proceedings of an International Symposium of the Pacific Seabird Group, Girdwood, Alaska, February 2006. Published 2007 in *Marine Ecology Progress Series* Volume 352:199-309. ***Available free of charge at*** http://www.int-res.com/abstracts/meps/v352/#theme

THE SALISH SEA ECOSYSTEMS: STATUS AND IMPACTS OF CHANGES ON MARINE BIRDS. Scott Hatch (editor), Douglas F. Bertram, John L. Bower, and Patrick D. O'Hara (guest editors.) 2009. Marine Ornithology, Salish Sea Symposium Issue 37: 1-76. ***Available free of charge at*** http://www.pacificseabirdgroup.org/publications/Hatch.etal.2008.pdf

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Information on presenting symposia: Pacific Seabird Group Symposia or Paper Sessions may be arranged by any member who is interested in a particular topic. Before planning a special session, refer to Meetings/Symposia Guidelines at www.pacificseabirdgroup.org; also contact the Scientific Program Chair for the annual meeting.

PUBLICATIONS OF THE PACIFIC SEABIRD GROUP

TECHNICAL PUBLICATIONS

EXXON VALDEZ OIL SPILL SEABIRD RESTORATION WORKSHOP. Kenneth I. Warheit, Craig S. Harrison, and George J. Divoky (editors). Exxon Valdez Restoration Project Final Report, Restoration Project 95038. PSG Technical Publication Number 1. 1997. ***Available free of charge at*** www.pacificseabirdgroup.org

METHODS FOR SURVEYING MARBLED MURRELETS IN FORESTS: A REVISED PROTOCOL FOR LAND MANAGEMENT AND RESEARCH. Pacific Seabird Group, Marbled Murrelet Technical Committee. PSG Technical Publication Number 2. 2003. ***Available free of charge at*** www.pacificseabirdgroup.org

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PACIFIC SEABIRD GROUP COMMITTEE COORDINATORS FOR 2016-2017

Committees do much of PSG's business, as well as the conservation work for which PSG is respected. The committees welcome (and need) information concerning their issues. Please contact one of these Coordinators with input, updates, to apply for a small grant (see PSG's website for eligibility), or if you wish to help a committee with its work.

AWARDS COMMITTEE

Nina Karnovsky, email: pastchair[at]pacificseabirdgroup dot org**; Kyra Mills,** email: chair[at]pacificseabirdgroup dot org**;** and **Adrian Gall,** email: programchair[at]pacificseabirdgroup dot org

COMMUNICATIONS COMMITTEE

Joanna Smith, email: communications[at]pacificseabirdgroup dot org

CONSERVATION COMMITTEE

Mark Rauzon, email: conservation[at]pacificseabirdgroup dotorg

CORRESPONDING MEMBERS COMMITTEE

Kyle Elliot, email: haliaeetus[at]gmail dot com

CRAIG S. HARRISON CONSERVATION SMALL GRANTS COMMITTEE

Verena Gill, email: verena dot gill[at]gmail dot com

ELECTION COMMITTEE

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ENDOWMENT FUND TRUSTEES COMMITTEE

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**deceased*

MEMBERSHIP INFORMATION

MEMBERSHIP BENEFITS

Members receive the following benefits: announcements of meetings, reduced rates on conferences and some publications, subscription to the PSG listserv, and most importantly, the knowledge of contributing to the study and conservation of Pacific seabirds wherever they occur. Annual membership is for one calendar year and expires each year on 31 December. Lifetime memberships are also available. All Life member contributions are dedicated to PSG's Endowment Fund, a fund to support the publications of the PSG, principally *Marine Ornithology.*

MEMBERSHIP RATES

Individual membership: $40
Student membership: $30
Life membership: $1,200 (can be divided into 5 annual payments of $240)

TO JOIN OR RENEW MEMBERSHIP

To join the Pacific Group or renew your membership, please go to: http://tiny.cc/psgmember

To edit information on an existing membership, please follow the link above and login using the e-mail address that you used to renew your membership (which may be different from your mailing-list e-mail address).

If you have any questions, please notify our Membership Coordinator: membership@pacificseabirdgroup.org
The Membership Coordinator is responsible for maintaining the membership database, assisting members with updating their information, sending new member information to the listserv coordinator, and other member assistance as needed.

MEMBER RESOURCES

To subscribe to the Pacific Seabird Group Listserv, please go to: lists-psg.org/mailman/listinfo/pacificseabirds_lists-psg.org
For access to the Pacific Seabird Group mailing list, please contact the coordinator at: listserv@pacificseabirdgroup.org.

Connect with the Pacific Seabird Group through our Facebook page at: https://www.facebook.com/PacificSeabirdGroup
Follow PSG on: Twitter at: http://twitter.com/#!/pacificseabirds
Instagram https://www.instagram.com/pacific_seabird_group/

PSG EXECUTIVE COUNCIL 2017

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