

# NOAA FISHERIES

## 2017 Accomplishments

Policy and Management	2
Research and Fieldwork	4
Presentations and Meetings	6
Publications	8
Outreach and Other Accomplishments	9
National Seabird Program Funded Projects	10
NSP Team	13



Black-footed Albatross.  
Photo credit: Robert L. Pitman

# National Seabird Program 2017 Annual Report

NOAA Fisheries’ National Seabird Program (NSP) is a crosscutting group of managers and scientists who work domestically and internationally to protect and conserve seabirds. Our activities are guided by statutes ([The National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries](#), [Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds](#),” the [Migratory Bird Treaty Act](#), [Magnuson-Stevens Reauthorization Act](#), [Endangered Species Act](#), [National Environmental Policy Act](#), [Oil Pollution Act](#)), and emerging agency priorities (e.g., [Ecosystem-Based Fishery Management Policy and Road Map](#), The [National Marine Fisheries Service Climate Science Strategy](#), [Annual Guidance Memoranda](#)). Together, these form the basis for NSP’s two overarching goals:

- 1) Mitigate bycatch – NOAA Fisheries is directly responsible for mitigating bycatch in U.S. fisheries, and supports a variety of international agreements and Regional Fisheries Management Organizations to mitigate bycatch associated with non-U.S. fisheries.
- 2) Promote seabirds as ecosystem indicators – Seabirds are excellent indicators of ecosystem status. As highly migratory, near-apex predators, they integrate across trophic levels, space, and time, and are easily studied relative to other marine species.

The NSP works through representation on steering committees and working groups within and external to NOAA Fisheries, and through partnerships with other NOAA Line Offices, Fisheries Management Councils (FMC), the States, and other Federal agencies (e.g., U.S. Fish and Wildlife Service, U.S. Geological Survey, U.S. Department of State). Our members work in all five NOAA Fisheries Regional Offices, six Science Centers, and Headquarters Offices of Protected Resources, Science and Technology, International Affairs, Sustainable Fisheries, Habitat Conservation, General Counsel, and NOAA’s National Ocean Service. As such, we are a nationally coordinated program that benefits from significant leveraging at the regional level.

This report summarizes the significant activities and accomplishments of the NSP during 2017. For more information, visit our website: <http://www.st.nmfs.noaa.gov/national-seabird-program/>

## Alaska Fisheries Science Center

National Bycatch Strategy, 2017 –  
*Review for NOAA Fisheries  
Headquarters*

North Pacific Fisheries Management  
Council Electronic Monitoring Working  
Group – *Worked on requirements for  
enumerating seabirds.*

Ecosystem Status Reports –  
*Incorporated seabird productivity and  
bycatch information into ecosystem  
indicator-based assessments to provide  
ecosystem context to groundfish harvest  
specifications of the North Pacific  
Fisheries Management Council.*

Stephani Zador

Groundfish and Halibut Observer  
Training (National Seabird Program-  
funded project) – *Ongoing with over 350  
observers trained to identify seabird  
species, collect procellariids (for  
necropsy, plastics, and food habits  
studies), and a suite of other specialized  
work.*

Shannon Fitzgerald  
Chris Rilling

Improvements to Electronic Monitoring  
– *Project 1 - Reviewed North Pacific  
Fisheries Management Council efforts to  
use EM for small longline vessels and  
real-time fisheries management; Project  
2 - Exploring the use of multi-spectral  
camera systems and machine learning to  
improve identification of seabirds.*

Shannon Fitzgerald  
Farron Wallace

Improving Estimates of Trawl-related  
Seabird Mortality – *Standard sampling  
does not fully account for total seabird  
mortality due to gear interactions in  
trawl fisheries. This research builds on  
earlier work and uses 2010-2016  
observer data to explore methods to  
obtain improved fleet-wide estimates;  
with Kim Dietrich.*

Shannon Fitzgerald

Spatiotemporal Patterns and Trends in  
Seabird Bycatch Rates (special focus on  
albatross catch rates) – *Research focuses*



**White-tailed Tropicbird. Photo credit: Chris Hoefer**

*on Alaskan longline fleets using over 20  
years of NOAA groundfish fisheries  
observer data; with Ed Melvin  
(Washington Sea Grant), Amanda  
Gladics (Oregon State University), and  
Kim Dietrich (Kim Dietrich Consulting),  
Rob Suryan*

## Alaska Regional Office

Biological Assessment for the Effect of  
Halibut Fisheries off Alaska on Short-  
tailed Albatross, Steller's Eider, and  
Spectacled Eider – *Submitted to USFWS  
2017*

Seabird Bycatch Report – *Summary of  
seabird bycatch from 2015 (see  
Publications)*

Seabird Bycatch Mitigation using  
Streamer Lines (National Seabird  
Program-funded project) – *In  
collaboration with Washington Sea  
Grant and Oregon State University, free  
streamer lines and seabird-related  
information are distributed to the Alaska  
longline fleet. Streamer lines are now  
available in Kodiak, Petersburg, Juneau,  
Ketchikan, Sitka, Dutch Harbor, Adak,  
and Akutan.*

<https://www.st.nmfs.noaa.gov/protected-species-science/other-protected-species/streamer-lines-saving-seabirds>

Anne Marie Eich

## International Affairs and Seafood Inspection

National Plan of Action for Reducing the  
Incidental Catch of Seabirds in Longline  
Fisheries (NPOA-Seabirds) – *Led  
discussions (agency-wide within NMFS  
and with USFWS points of contact) to  
explore initiation of an update of the  
NPOA-Seabirds.*

Mi Ae Kim

## Northwest Fisheries Science Center

At-sea Hake Observer Program  
(National Seabird Program-funded  
project) – *The West Coast Groundfish  
Observer Program continued to collect  
fixed gear mitigation device and gear  
characterization data to quantify seabird  
third wire interactions. At least one  
Catcher-Processor attempted to mitigate  
for seabird cable strikes this year.*

Ryan Shama  
Christa Colway  
Jon McVeigh

Short-tailed Albatross Bycatch –  
*Estimated bycatch in U.S. West Coast  
groundfish fisheries 2014-2015 as basis  
for risk assessment in the NOAA  
Fisheries Biological Assessment for the  
re-initiation of the Biological Opinion  
for the Effects of the Continuing  
Operation of the West Coast Groundfish  
Fisheries on Short-tailed Albatross.*

Tom Good  
Jason Jannot  
Ryan Shama  
Neil Riley  
Jon McVeigh

Seabird Avoidance Measures – *Reviewed  
for West Coast Region.*

West Coast Groundfish Observer  
Program – *Reviewed and revised ESA-  
listed seabird identification manual.*

Ryan Shama  
Christa Colway  
Jon McVeigh

## Pacific Islands Regional Office

Black-footed Albatross Takes in Deep-  
Set Fishery – *In collaboration with*

## Policy and Management

*PIRO's Sustainable Fisheries Division, Hollings Scholar, Tammy Russel completed this analysis and presented results at the seabird interactions workshop hosted by the Western Pacific Fishery Management Council (November 2017).*

Sarah Ellgen

Seabird Handling Video for Fishermen (National Seabird Program-funded project) – *Developing seabird handling video which includes proper albatross handling techniques.*

Sarah Ellgen  
Andrew Torres

Seabird Mitigation Requirements – *Reviewed draft seabird conservation and management measures (CMM 2015-03) for Western and Central Pacific Fisheries Commission.* (<https://www.wcpfc.int/node/29851>)

Zora McGinnis

Observer-Reported Longline Protected Species Interactions within the Proposed Papahānaumokuākea Marine National Monument Expansion Area – *Collaboration with National Ocean Service*

John Peschon

### **Southeast Fisheries Science Center**

2016 Seabird Bycatch Estimates for NOAA's National Bycatch Report – *Completed for the Atlantic Pelagic Longline Fishery*

Improvements in Seabird Bycatch Estimation Methods – *Designed to be particularly effective in handling data with exceptionally high percentages of zeros and ones (characteristic of bycatch data), these improved methods employ k-aggregated generalized linear modeling; Annual estimates for previous years were recalculated with the new methods.*

Seabird Bycatch Risk Assessment – *Probability of seabird bycatch and observation/recording by fisheries observers quantified for a hypothetical seabird population.*

Seabird Identification Training - *for fisheries observers in the Pelagic Observer Program*

Joan Browder

In collaboration with the Department of Fish and Wildlife Conservation at Virginia Tech

### **Southwest Fisheries Science Center**

Memorandum of Understanding between NMFS and USFWS – *Pertaining to Executive Order 13186, this expired MOU formalizes collaboration between these two federal agencies to manage seabirds according to statutes; discussions are ongoing regarding reauthorization of the MOU.*

Lisa T. Ballance

## Synergistic Policy and Management Collaborations

Mitigation Measures for Nighttime Seabird Vessel Strikes – *Exploring the use of LED lights for non-lethal deterrence*

Jeannette Zamon (NWFSC)  
Jeff Shenot (OHC)

U.S. Delegation Agreement on the Conservation of Albatrosses and Petrels (ACAP) Briefing – NOAA Employees and affiliates, led by Mi Ae Kim, assisted with review and comments of U.S. Delegation's AC10 Briefing Book; Elizabeth Flint (USFWS), Eric Gilman, Ed Melvin (University of Washington), Roberta Swift (USFWS), and Joe Fette assisted.

Mi Ae Kim  
Lisa T. Ballance  
Anne Marie Eich  
Shannon Fitzgerald  
Zora McGinnis  
John Peschon  
Farron Wallace

Seabird Trawl Mortality and Mitigation Measures – *Lead on project to improve monitoring and estimate seabird bycatch in Alaskan fisheries; steering committee member and host for workshop to develop seabird mitigation measures for trawlers (primarily West Coast hake fishery).*

Jason Jannot  
Tom Good  
Vanessa Tuttle  
Shannon Fitzgerald (AFSC)  
Anne Marie Eich (ARO)

Seabird Avoidance Measures (National Seabird Program-funded project) – *Handout developed and distributed to West Coast longline fisheries.*

Yvonne deReynier  
Anne Marie Eich (ARO)  
Ryan Shama (NWFSC)



## Alaska Fisheries Science Center

Food Habits, Plastic Ingestion, and Demographic Vulnerability of Seabirds to Fisheries Bycatch (National Seabird Program-funded project) – *Over 2,960 bycaught seabirds have been processed; Publications pertaining to Northern Fulmar and North Pacific Albatross are in preparation.*

Shannon Fitzgerald

Seabird Information to Inform Ecosystem-Based Fisheries Management – *A wealth of data and information is generated each year on seabirds in Alaskan waters. These data are summarized in the Ecosystem Considerations (Status) Reports as part of the annual Stock Assessment and Fisheries Evaluation reports to the North Pacific Fisheries Management Council to provide an ecosystem context to inform the annual process for establishing quotas for groundfish fisheries. Seabird information on breeding, recruitment, food habits, and other items are included in the key factors component of these annual reports, which have taken on more and more significance each year for fisheries management in Alaska.*

Seabird Food Habits – *Working in collaboration with USFWS' Alaska Maritime National Wildlife Refuge, this research uses seabird diet data collected from colonies to inform Ecosystem Based Fishery Management.*

Stephani Zador

## Northeast Fisheries Science Center

Atlantic Marine Assessment Program for Protected Species (AMAPPS) – *NOAA, BOEM, USFWS, and U.S. Navy are collaborating to develop models and associated tools to provide seasonal, spatially-explicit density estimates for marine mammals, turtles, and seabirds in the western North Atlantic Ocean. The project uses data collected aboard NOAA research vessel surveys, the most recent conducted from July 5 – August 9, 2017.*

Debra Palka



**First-year Laysan Albatross undergoing molt.**  
Photo credit: Chris Hoefer

At-Sea Seabird Data collected aboard Broadscale Ecosystem Monitoring Surveys – *Thanks to funding from BOEM, seabird teams used standard strip transect methods, supplemented with distance sampling, and SWFSC's SeeBird software to collect at-sea data aboard these surveys.*

Harvey Walsh  
Debra Palka

## Northwest Fisheries Science Center

Seabirds in the California Current Integrated Ecosystem Assessment – *Project 1 - Seabird time-series website constructed including at-sea habitat use, diet, productivity, and mortality; Project 2 - Risk Assessment of California Current Seabirds from Marine Debris, in collaboration with Commonwealth Scientific and Industrial Research Organisation, Point Blue Conservation, Farallon Institute, Oregon State University, San Jose State University, and Pacific Rim Conservation*

Rhinoceros Auklet Diet and Reproductive Output – *Completed 2017 fieldwork in Puget Sound and northern California Current.*

Tom Good

Annual Seabird Survey, Northwestern coast of U.S. – *Data collected Cape*

*Flattery, WA to Newport, OR, 20-30 June 2017.*

Seabird Communities During Winter Downwelling Conditions in the Northern California Current (National Seabird Program-funded project) – *Analysis ongoing.*

Winter Distribution of Cassin's Auklet in 2014-15 (National Seabird Program-funded project) – *This analysis is ongoing and relevant to a winter die-off event of this species coincident with the "Warm Blob" event.*

Jeannette Zamon

## Southeast Fisheries Science Center

Gulf of Mexico Marine Assessment Program for Protected Species (GoMMAPPS) – *NOAA, Bureau of Ocean Energy Management, U.S. Fish and Wildlife Service, and U.S. Geological Service launched an intensive 3-year program to improve assessment of protected marine species in the Gulf of Mexico, including seabirds, to inform federally mandated environmental assessments related to offshore energy and marine minerals development. During 2017, surveys were conducted between April 28 and September 30.*

Lance Garrison

Seabird Observer ID Training – *January 2017.*

Joan Browder

## Southwest Fisheries Science Center

Long-term Seabird Research in Support of Fisheries Management – *The 2017/18 Antarctic field season is being conducted at Cape Shirreff, Livingston Island, and Copacabana Field Camp, King George Island (Antarctic Peninsula). Both are sites of long-term monitoring of krill predators (including penguins and Brown Skuas) to advise fishery managers in the Southern Ocean on potential impacts of fishing and environmental change on status and performance of air breathing predators.* <https://swfsc.noaa.gov/textblock.aspx?parentmenuid=42&id=22832>

Jefferson Hinke

## Research and Fieldwork

Hawaiian Islands Cetacean & Ecosystem Assessment Survey (HICEAS) – This survey of the Hawaiian Archipelago’s EEZ was conducted jointly with PIFSC,

6 July – 9 December, 2017. This is the third in a time series that dates to 2001. Seabird data (one of many projects on the survey) were collected using

standard strip transect methods.  
<https://www.pifsc.noaa.gov/hiceas/>

Lisa T. Ballance

## Synergistic Research and Fieldwork Collaborations

Juvenile Salmon Ocean Ecosystem Survey – Seabird data were collected aboard this survey, conducted June 21-29, 2017. Highly unusual ocean conditions were correlated with reductions in juvenile salmon and forage fishes seen at the surface, the lowest abundance of Sooty Shearwaters observed since 2003, and low abundance of Common Murres.

Jeannette Zamon (NWFSC)  
Jeff Shenot (OHC)

Predictive Seabird Density Maps – Collaboration of SWFSC, NWFSC, Bureau of Ocean Energy Management and USGS to synthesize data and create predictive density maps of seabirds for the California Current; Information will be used to help BOEM evaluate applications for ocean energy use permits (e.g. wind, wave, tidal energy installations).

Jeannette Zamon (NWFSC)  
Jeff Shenot (OHC)  
Lisa T. Ballance (SWFSC)



Juan Fernandez Petrel. Photo credit: Chris Hoefler

### **Protected Species Assessment Workshop, Seattle, Washington, January 2017**

- *Novel methods for abundance and trends assessment and data poor bycatch estimation for protected species*; Anne Marie Eich, Shannon Fitzgerald, Tom Good, Jason Jannot, Jon McVeigh

### **American Bird Conservancy, Washington DC, January 2017**

- *Review of electronic monitoring and applications to artisanal fisheries*; Shannon Fitzgerald

### **Pacific Seabird Group Annual Meeting, Tacoma, Washington, February 2017**

- *Linking at-sea conditions with the coast-wide Cassin's Auklet mass mortality event of 2014-2015*; Jeannette Zamon, Laura Bliss
- *Population trends of Alaskan seabirds, 1974-2016*; Aaron Christ, Heather Renner, Stephani Zador
- *Where have all the forage fish gone? Anomalously poor Rhinoceros Auklet breeding season suggests changes in forage fish availability*; Peter Hodum, Scott Pearson, Thomas Good
- *Seabird bycatch and mitigation efforts in Alaska fisheries 2007 through 2015*; Anne Marie Eich, Kristin Mabry, Sadie Wright, Shannon Fitzgerald
- *Seabird interactions in the Hawaii deep and shallow set longline fisheries in 2015*; John Peschon, Sarah Ellgen
- *Differences in shearwater and murre distributions near the Columbia River Plume during spring and summer*; Elizabeth Phillips, Josh Adams, Jeannette Zamon, John Horne
- *The devil is in the detail: trends in albatross bycatch rates in Alaskan longline fisheries*; Edward Melvin, Kim Dietrich, Robert Suryan, Amanda Gladics
- *A summary of albatross band recovery data in the Hawaii deep and shallow set longline fisheries*; John Peschon
- *Seabirds help to inform forage fish trends in relation to environmental conditions in the Gulf of Alaska*; Stephani Zador
- *Plastics in the Pacific: assessing risk from marine debris on seabirds in the California Current*; Thomas Good, Jameal Samhuri, Blake Feist, Chris Wilcox, Jaime Jahncke, Scott Shaffer
- *Community engagement strategies for promoting seabird bycatch reduction in commercial fisheries*; Amanda Gladics, Edward Melvin, Robert Suryan
- *The risk of rodent introductions from shipwrecks to seabirds on Aleutian and Bering Sea Islands*; Martin Renner, Eric Nelson, Jordan Watson, Alan Haynie, Aaron Poe, Martin Robards
- *Use of marine bird distribution models by regional ocean councils for spatial planning*; Arliss Winship, Brian Kinlan, Jesse Cleary, Corrie Curtice, Patrick Halpin, Emily Shumchenia
- *Natural selection on morphology varies among years and by sex in Magellanic Penguins (*Spheniscus magellanicus*)*; Laura Koehn, Jeffrey Hard, Elaine Akst, Dee Boersma
- *Testing whether unmanned aircraft systems can be used to locate cryptic nests of the Marbled Murrelet*; Lindsay Adrean, Matthew Pickett, Brian Taggart, S. Nelson, Daniel Roby, Matthew Betts
- *Beach combers reflections on seabird mortality events, 1997-2016*; Jacqueline Lindsey, Emily Kelsey, Corinne Gible, Erica Donnelly-Greenan Hannah Nevins, Scott Benson
- *Short-tailed Albatross Recovery Team Meeting*; Rob Suryan (Chair), Anne Marie Eich, Shannon Fitzgerald, Ryan Shama, Christa Colway, Jon McVeigh
- *Seabird Monitoring Working Group Meeting (hosted by USFWS)*; Shannon Fitzgerald
- *Gillnet Bycatch Special Session*; Shannon Fitzgerald
- *Tufted Puffin Technical Committee Meeting*; Tom Good
- *North Pacific Albatross Working Group Meeting*; Anne Marie Eich, Sarah Ellgen, Shannon Fitzgerald, Tom Good, John Peschon, Rob Suryan

### **Salmon Ocean Ecology Meeting, Seattle, Washington, March 2017**

- *Spatial and temporal variation in ocean avian predation risk to Columbia River chinook salmon*; Jeannette E. Zamon, Brian J. Burke, Mary Hunsicker, Elizabeth M. Phillips, and David J. Teel

### **Mitigating Bycatch: Novel Insights through Multidisciplinary Approaches, Sete, France, April and September 2017**; Lisa T. Ballance (Co-chair)

### **Inter-American Tropical Tuna Commission Meetings, La Jolla, CA, May 2017**

- IATTC Bycatch Working Group Meeting, *Seabird bycatch in the eastern Pacific Ocean*; Lisa T. Ballance
- IATTC Scientific Advisory Committee Eighth Meeting; Lisa T. Ballance



### **BOEM-Sponsored Science Symposium, Camarillo, CA, May 2017**

- *Pacific Marine Assessment Program for Protected Species - NMFS-BOEM-Navy-USFWS partnership for large geographic-scale research surveys and data products on mammals, turtles, and seabirds (invited presentation);* Lisa T. Ballance

### **Hawaii Conservation Conference, Honolulu, HI, and FishCon, San Diego, CA, July 2017**

- *Seabird interactions in the Hawaii longline fisheries in 2015;* Sarah Ellgen

### **Ecosystem Monitoring and Management Working Group (CCAMLR), Buenos Aires, Argentina, July 2017**

- *Progress report of the CCAMLR Ecosystem Monitoring Program (CEMP) Special Fund overwinter penguin tracking project;* Jefferson Hinke
- *Progress report of the CEMP Special Fund project to develop an image processing software tool for analysis of camera network monitoring data;* Jefferson Hinke
- *Progress report of the CEMP Special Fund camera network in Subarea 48.1;* Jefferson Hinke
- *Characterising the preferred at-sea habitats used by chinstrap penguins and the fishery for Antarctic krill: slow-flowing, nearshore waters over shallow bathymetry;* Jefferson Hinke

### **American Fisheries Society, Tampa, Florida, August 2017**

- *A summary of seabird interactions in the Hawaii deep and shallow set longline fisheries in 2016;* John Peschon
- *A summary of albatross band recovery data in the Hawaii deep and shallow set fisheries;* John Peschon

### **ACAP Advisory Committee (AC10), Seabird Bycatch Working Group, Population and Conservation Status Working Group and Pterodroma Workshop, Wellington, New Zealand, September 4-15, 2017;** Mi Ae Kim

### **North Pacific Fisheries Management Council Electronic Monitoring (NPFMC) Working Group, Seattle, WA, September 2017**

- *Focus on integrating electronic monitoring tools into the observer program for the fixed gear groundfish and halibut fisheries;* Shannon Fitzgerald

### **NMFS Alaska Groundfish and Halibut Seabird Working Group, September 2017;** Anne Marie Eich, Shannon Fitzgerald

### **Aleutian Bering Sea Island LCC Steering Committee Retreat, September 2017;** Shannon Fitzgerald

### **Western and Central Pacific Fisheries Commission Technical and Compliance Committee Pohnpei, Micronesia, September/October 2017;** Zora McGinnis

### **National Observer Program Advisory Team (NOPAT) Annual Meeting, October 2017**

- *NOAA Fisheries National Seabird Program: overview, goals, activities and recent accomplishments;* Lisa T. Ballance

### **NOAA Fisheries Seabird Cable Strike Mitigation Workshop, Seattle, Washington, November 2017;** Steering Committee: Anne Marie Eich, Shannon Fitzgerald, Tom Good, Jason Jannot (Lead), and Vanessa Tuttle; Participants: Christa Colway, Jon McVeigh, and Ryan Shama

### **Western Pacific Fishery Management Council Workshop on Albatross Interactions in the Hawaii Longline Fishery, Hawaii, November 2017**

- *Factors influencing albatross interactions in the Hawaii longline fishery: towards identifying drivers and quantifying impacts*  
John Peschon, Sarah Ellgen
- Meeting Participants: Melanie Brown, Mi Ae Kim

### **Council for Conservation of Migratory Birds Quarterly Meetings, Washington DC, 2017;** Lee Benaka, Annette Henry

## NSP team members in bold

**Eich, A. M., S. M. Fitzgerald**, and J. Mondragon. 2017. Seabird bycatch estimates for Alaska groundfish fisheries annual report: 2015. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/AKR-13, 31 p. doi:10.7289/V5/TM-F/AKR-13. ([ftp://ftp.library.noaa.gov/noaa\\_documents.lib/NMFS/TM\\_NMFS\\_AFKR/TM\\_NMFS\\_FAKR\\_13.pdf](ftp://ftp.library.noaa.gov/noaa_documents.lib/NMFS/TM_NMFS_AFKR/TM_NMFS_FAKR_13.pdf))

**Eich, A. M., Mabry, K. R., Wright, S. K. and Fitzgerald, S. M.** 2016. Seabird bycatch and mitigation efforts in Alaska fisheries summary report: 2007 through 2015. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/AKR-12, 47p. doi:10.7289/V5/TM-F/AKR-12. ([http://docs.lib.noaa.gov/noaa\\_documents/NMFS/TM\\_NMFS\\_AFKR/TM\\_NMFS\\_FAKR\\_12.pdf](http://docs.lib.noaa.gov/noaa_documents/NMFS/TM_NMFS_AFKR/TM_NMFS_FAKR_12.pdf))

**T. P. Good, Jannot, J., Shama, R.,** Riley, N., and **McVeigh, J.** 2017. Report to Pacific Fisheries Management Council ESA Workgroup. ([http://www.pcouncil.org/wp-content/uploads/2017/03/F5a\\_NMFS\\_Rpt6\\_ElectricOnly\\_STAL\\_bycatch\\_report\\_2017\\_Apr2017BB.pdf](http://www.pcouncil.org/wp-content/uploads/2017/03/F5a_NMFS_Rpt6_ElectricOnly_STAL_bycatch_report_2017_Apr2017BB.pdf))

**Lisa T. Ballance, Anne Marie Eich, Sarah Ellgen, Shannon Fitzgerald,** Eric Gillman, **Mi Ae Kim, Zora McGinnis,** Ed Melvin, **John Peschon,** Roberta Swift, Farron Wallace, Joe Fette, Beth Flint. U.S. Delegation Agreement on the Conservation of Albatrosses and Petrels Briefing Book.

**Fitzgerald, S.,** Wallace, F., and **Kim, M.** 2017. Recent U.S. experience with electronic monitoring, seabird monitoring, and incorporation into standard management protocols. Working Paper Submitted to the Eighth Meeting of the Seabird Bycatch Working Group, Agreement on the Conservation of Albatross and Petrels.

Gladics, A. J., Melvin, E. F., **Suryan, R. M., Good, T. P., Jannot, J. E.,** & Guy, T. J. 2017. Fishery-specific solutions to seabird bycatch in the U.S. West Coast sablefish fishery. *Fisheries Research*, 196, 85-95. (<https://www.sciencedirect.com/science/article/pii/S0165783617302291>)

**Hinke, J. T.,** Trivelpiece, S. G., and Trivelpiece, W. Z. 2017. Variable vital rates and the risk of population declines in Adélie penguins from the Antarctic Peninsula region. *Ecosphere* 8(1). (<http://onlinelibrary.wiley.com/doi/10.1002/ecs2.1666/full>)

**Hinke, J. T.,** Cossio, A. M., Goebel, M. E., Reiss, C. S., Trivelpiece, W. Z., and Watters, G. M. 2017. Identifying risk: concurrent overlap of the Antarctic krill fishery with krill-dependent predators in the Scotia Sea. *PLoS ONE*. (<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0170132>)

Polito, M. J., **Hinke, J. T.,** Hart, T., Santos, M., Houghton, L. A. and Thorrold, S. R., 2017. Stable isotope analyses of feather amino acids identify penguin migration strategies at ocean basin scales. *Biology Letters*, 13(8).

Sydeman, W. J., Thompson, S. A., Anker-Nilssen, T., Arimitsu, M., Bennison, A., Bertrand, S., Boersch-Supan, P., **Boyd, C.,** Bransome, N.C., Crawford, R.J. Daunt, F., Furness, R., Gianucan, D., Gladics, A., Koehn, L., Lang, J., Logerwell, E., Morris, T., **Phillips, E.,** Provencher, J., Punt, A., Sarau, C., Shannon, L., Sherley, R., Simeone, A., Wanless, R., Wanless, S., and **Zador, S.** 2017. Best practices for assessing forage fish fisheries-seabird resource competition. *Fisheries Research*, 194: 209-221. (<https://www.sciencedirect.com/science/article/pii/S0165783617301455>)

Sydeman, W. J., Piatt, J. F., Thompson, S. A., García, Reyes, M., Hatch, S. A., Arimitsu, M. L., Slater, L., Williams, J. C., Rojek, N. A., **Zador, S. G.** and Renner, H. M. 2017. Puffins reveal contrasting relationships between forage fish and ocean climate in the North Pacific. *Fisheries Oceanography*, 26(4), pp.379-395.

Sydeman, W. J., Thompson, S. A., Piatt, J. F., García-Reyes, M., **Zador, S.,** Williams, J. C., Romano, M. and Renner, H. M., 2017. Regionalizing indicators for marine ecosystems: Bering Sea–Aleutian Island seabirds, climate, and competitors. *Ecological Indicators*, 78, pp.458-469.

Wells, B. K., Santora, J. A., Henderson, M. J., Warzybok, P., Jahncke, J., Bradley, R. W., Huff, D. D., Schroeder, I. D., Nelson, P., Field, J. C. and Ainley, D. G., 2017. Environmental conditions and prey-switching by a seabird predator impact juvenile salmon survival. *Journal of Marine Systems*. (<http://www.sciencedirect.com/science/article/pii/S0924796317300866>)

Youngflesh, C., Jenouvrier, S., Li, Y., Ji, R., Ainley, D. G., Ballard, G., Barbraud, C., Delord, K., Dugger, K. M., Emmerson, L. M., Fraser, W. R., **Hinke, J. T.,** Lyver, P. O'B., Olmastroni, S., Southwell, C. J., Trivelpiece, S. G., Trivelpiece, W. Z. and Lynch, H. J. (2017). Circumpolar analysis of the Adélie Penguin reveals the importance of environmental variability in phenological mismatch. *Ecology*. doi:10.1002/ecy.1749.

## In Press

Orben, R., A. O'Connor, **R. Suryan,** K. Ozaki, F. Sato, and T. Deguchi. *In press*. Ontogenetic changes in at-sea distributions of immature short-tailed albatrosses, *Phoebastria albatrus*. *Endangered Species Research*. (<http://www.int-res.com/prepress/n00864.html>)



## Outreach and Other Accomplishments

### Alaska Fisheries Science Center

Team Member of the Year – *Awarded to Jessie Beck (Oikonos) for her exceptional management of the seabird necropsy program.*

Longline Bycatch Outreach – *Washington Sea Grant is conducting a large review of longline bycatch and leading outreach, based on observer data collection.*

Seabird Necropsy Internships and Fellowships - *As part of the seabird necropsy program, Wings and Fins ([oikonos.org/wingsandfins/](http://oikonos.org/wingsandfins/)) and UC Santa Cruz, provided 11 internships and 2 post-graduate fellowships for participation in bycatch and plastic/prey seabird research in 2016-17.*  
Shannon Fitzgerald

### Northwest Fisheries Science Center

Bird-centered Science Curriculum for Visually Impaired Students – *Work with Washington State School for the Blind on behalf of Mr. Haruo Uchiyama, Master Woodcarver, Japan*  
Jeannette Zamon

### Southwest Fisheries Science Center

At-Sea Seabird Data Collection Training – *For Channel Islands National Marine Sanctuaries Staff in preparation for an upcoming fine-scale survey of the sanctuary*  
Lisa T. Ballance

International Migratory Bird Day Outreach – *In partnership with National Ocean Service's Office of National Marine Sanctuaries.*

Lisa T. Ballance and Annette Henry



Band-rumped Storm-Petrels. Photo credit: Glen Davis

## Synergistic Outreach and Other Accomplishments Collaborations

Not Just Winging It – *Seabird visual team featured in online blog from HICEAS 2017 field season (<https://pifscblog.wordpress.com/2017/11/24/hiceas-seabird-observers/>).*

Dawn Breese and Lisa T. Ballance (SWFSC)  
Amanda Bradford (PIFSC)

Seed funding for these projects was provided by the  
Office of Science and Technology's National Observer Program

## Seabird Cable Strike Mitigation Workshop

Jason Jannot, Northwest Fisheries Science Center, Anne Marie Eich, Alaska Regional Office, Shannon Fitzgerald, Alaska Fisheries Science Center, Vanessa Tuttle, Northwest Fisheries Science Center, and Tom Good, Northwest Fisheries Science Center

Seabirds congregate around trawlers to feed on offal putting them at risk of colliding with cables that run aft of trawlers (trawl warps and data cables). Cable strikes are a known source of seabird mortality, particularly on at-sea factory trawlers. Research projects observing seabird cable strikes in the Alaska trawl fisheries in the Bering Sea and in the West Coast at-sea hake fishery have been conducted. Data from both studies indicate that the estimated mortalities for cable strikes are much greater than the observed mortalities collected as part of typical observer duties. To address this issue, NOAA Fisheries hosted a 2-day workshop on gear modification strategies for reducing seabird bycatch in West Coast trawl (hake) and Alaska trawl fisheries. The workshop was held November 7-8, 2017 in Seattle, WA, and brought together the at-sea processing industry, engineers, biologists and fisheries managers to develop innovative, practical gear-modifications for reducing seabird cable strike mortality. Mitigation strategies that might reduce cable strikes and could be tested at-sea were identified.



Photo credit: L. Shiosaka, A-SHOP 2016

## Illustrating a Seabird Handling Guide

Andrew Torres and Sarah Ellgen, Pacific Islands Regional Office

In 2015, NOAA Fisheries observers recorded 132 seabirds incidentally caught in the Hawaiian deep-set (bigeye tuna) longline fishery (20% of fishing trips observed) with 9.4 million hooks set. Of these seabirds, 19 were released injured, and 113 were dead. In the Hawaiian shallow-set (swordfish) longline fishery (100% of trips observed), observers documented 81 bycaught seabirds with 1.3 million hooks set; 65 were injured and 16 were dead. Federal regulations require Hawaii longline fishing vessels to practice certain seabird avoidance and handling measures (50 CFR 665.815). These requirements have reduced the seabird interaction rates by approximately 74% in the deep-set fishery, and 91% in the shallow-set fishery. For example, setting gear at night is an effective measure for avoiding seabird interactions in the shallow-set fishery, as many seabirds are visual predators and most seabird interactions (75%) occur during the haul, when birds are more likely to be foraging. Many of these birds are retrieved alive (80% in 2015) because fishermen retrieve the birds shortly after they are caught and 99% of these are black-footed or Laysan albatrosses (*Phoebastria nigripes*, *P. immutabilis*, respectively). Albatrosses are large birds with large wingspans; their size and strength can make handling the birds and removing fishing gear a challenge. To address this, a user-friendly guide for longline vessel owners, operators, and NOAA Fisheries observers was developed, illustrating systematic procedures for safe handling and release of hooked or entangled seabirds. The guide is also designed to be understood easily by non-English speakers. NOAA Fisheries includes the guide in seabird handling kits for longline fishing vessel owners and captains, and uses it when training fisheries observers.



Black-footed Albatross. Photo credit: NOAA Fisheries

## Quantifying Unobserved Seabird Bycatch in the Hake Catcher-processor Fishery

Thomas P. Good, Jason Jannot, and Vanessa Tuttle, Northwest Fisheries Science Center

Seabird mortalities caused by striking trawl warps or the data transponder cable (a.k.a. 3rd wire) have been recorded in hake processing fleets in both Alaska and the Southern Hemisphere. However, observations of seabird cable strikes by fisheries observers are rare because observer duties prevent them from being present for the majority of strikes. A pilot project in 2016 monitored hauls on hake catcher-processor vessels and recorded 120 strikes, 30 of which were classified as "hard" strikes (potential to cause mortality). Extrapolating observations to the total daytime towing fleet sector suggested that up to 738 hard strikes of Black-footed Albatross

were occurring; assuming a 12% mortality rate, this would result in 85 Black-footed Albatrosses killed in 2016. To address the need for bycatch estimates to include mortalities from 3<sup>rd</sup> wire strikes, observers were outfitted with project-specific equipment and supplies to a) facilitate systematic quantification of seabird cable strikes, b) gauge the potential for mortality based on individual fate assessment after cable interaction, and c) incorporate observer-recorded data on factors that may influence cable-strike probabilities (e.g., bird density, offal plume presence) to develop model-based estimates of cable strike mortality. The ultimate goal is to develop mitigation solutions, in collaboration with industry, to seabird bycatch resulting from cable strikes in this fishery.

### **Seabird Communities and Ocean Conditions During the Winter Downwelling Season in the Northern California Current**

Jeannette E. Zamon, Northwest Fisheries Science Center

Surface waters of the northern California Current Ecosystem have limited winter productivity due to reductions in daylight hours and nutrient-rich upwelling. Seabirds are thought to be more vulnerable to climate-driven starvation during winter because they are likely to be food-stressed at that time. Mass starvation events of Cassin's auklets (*Ptychoramphus aleuticus*) and common murrelets (*Uria aalge*) during a marine heat wave in 2014/2015 are recent examples of such vulnerability. Winter ecology of seabirds in coastal Oregon and Washington is not well described, in part because few survey vessels are active during the months of November–March.

Describing winter species composition, locations of high abundance or diversity, and winter habitat characteristics are first steps to improving understanding of winter ecology in this area. This project compiles and analyzes 2006–2015 winter/spring seabird survey data collected by the Northwest Fisheries Science Center from NOAA research vessels to (1) compile summaries of community composition during November to early April; (2) generate maps of seabird sightings and identify regions with high abundance or high diversity, and (3) perform a multivariate analysis with available oceanographic variables to describe seabird associations with winter ocean conditions. Regions identified as having high seabird abundance or diversity will serve as ecosystem indicators for times and places where underlying oceanographic processes are fueling the winter food web.

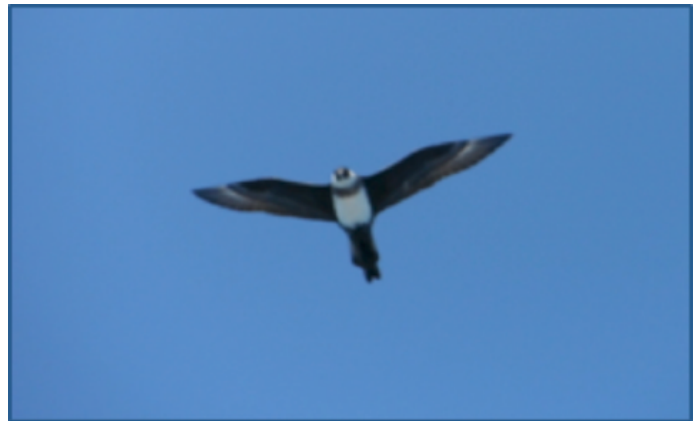


Parakeet Auklets. Photo credit: Robert L. Pitman

### **Pushing the Limits on What Can Be Learned from a Small Amount of Data**

Joan A. Browder, Southeast Fisheries Science Center and Yan Jiao, Virginia Polytechnic State Institute

Sets that catch seabirds make up a small component of observed effort in the U.S. North Atlantic pelagic longline fishery, as in most longline fisheries, and, of the sets that do catch seabirds, most catch only one; creating statistical models for estimating the total seabird bycatch of the fleet is challenging. Building on previous work with random-year delta GLM models, a new delta approach that addresses not only the low proportion of positive sets (i.e., sets that catch seabirds) in longline data, but also the proportion of singletons within them has been developed. This approach substitutes a modified CMP distribution for the log normal distribution in the sub-model for positive sets. A generalization of the Poisson distribution, the CMP has an additional shape parameter (K) that allows it to model either over-dispersion or under-dispersion and thus accommodates altering the shape of the distribution to fit a higher probability of singletons. Bayesian methods also were used to better estimate uncertainty and facilitate further model development to address rare seabird bycatch observation. This approach was used with longline logbook data to estimate total and annual fleet seabird bycatch from 1992 to 2016. The method could be used to analyze data on other rare bycatch such as whales, turtles, and species of sharks and other fish.



Pomarine Jaeger caught on camera by pelagic longline observer in southeastern Gulf of Mexico, April 2014. Another jaeger species (parasitic) was identified in Gulf of Mexico pelagic longline bycatch in December 2012.



### **Distribution and Abundance of Seabirds in the Hawaiian Archipelago: Continuing a Time Series**

Lisa T. Ballance and Annette Henry, Southwest Fisheries Science Center

NOAA Fisheries' focus on seabirds is associated with two overarching goals: 1) mitigate bycatch, and 2) promote seabirds as ecosystem indicators, each a direct result of emerging agency priorities and statutes to which we respond (<http://www.st.nmfs.noaa.gov/protected-species-science/other-protected-species/national-seabird-program>). Seabird data collected at sea aboard NOAA research vessel surveys address both of these goals. 1) Data on abundance and distribution is necessary to identify which species are vulnerable to bycatch, to quantify where and when, and to develop risk assessment and bycatch mitigation strategies. 2) Seabirds are excellent indicators of ecosystem status. As highly migratory, near-apex predators, seabirds integrate across trophic levels, space, and time, and are easily studied relative to other marine species. Their abundance, distribution, and temporal patterns can provide valuable insights into ecosystem status. From July through December 2017, seabird data were collected in waters within the Exclusive Economic Zone of the Hawaiian Archipelago, as part of a cetacean and ecosystem assessment survey conducted aboard NOAA research vessels SETTE and LASKER (<https://www.pifsc.noaa.gov/hiceas/>). This represents the third such survey; (the previous two were conducted in 2002 and 2010). Strip transect methods for seabirds, and line transect methods for seabird feeding flocks result in two datasets that can be added to the time series. In addition to fulfilling NOAA Fisheries objectives, these seabird data will provide the first comprehensive dataset for the Papahānaumokuākea Marine National Monument (PMNM) since its expansion. PMNM is home to more than 14 million birds living in what is collectively the largest tropical seabird rookery in the world. Funding from NOAA Fisheries was heavily leveraged through partnerships with two additional Federal agencies, Bureau of Ocean Energy Management, and U.S. Navy, both of which provided significant funding for this survey.



Great Frigatebird. Photo credit: Robert L. Pitman

### **Pacific Seabird Bycatch Necropsy Program**

Shannon Fitzgerald, Alaska Fisheries Science Center, Michelle Hester, Oikonos, John Kelly, Pacific Islands Regional Office, and Chris Rilling, Alaska Fisheries Science Center

Since 2007, this program has supported the collection of bycaught seabirds by observers in Alaska, Hawaii, and U.S. West Coast fisheries, with special focus on procellariids. Birds are necropsied and a broad suite of data collected that can be used to refine estimates of the impacts of bycatch on populations, monitor changes in the marine environment, and address high priority items in the USFWS Laysan and Black-footed Albatross Conservation Action Plan. The resulting dataset represents a valuable time-series with over 2,962 birds collected and 331 carcasses processed between September 2016 and August 2017. Current analytical projects focus on a) quantifying age and sex ratios of Northern Fulmars bycaught in Alaska Fisheries and age and sex ratios of Laysan and Black-footed Albatross bycaught in Alaska and Hawaii, b) identification of prey items in seabird stomachs to determine diet preferences, and c) investigating plastic ingestion patterns.

### **Seabird Training for Alaska Groundfish Observers**

Shannon Fitzgerald, Alaska Fisheries Science Center, Julia Parrish and Hillary Burgess, University of Washington Coastal Observation and Seabird Survey Team (COASST)

The USFWS and NOAA's Alaska Fisheries Science Center worked closely during the high seas driftnet program, 1989-1993, to provide seabird training to observers. Based on this collaboration, observer duties in the North Pacific Groundfish Observer Program were expanded to include seabird observation and bycatch monitoring and supporting materials for observers were developed. Species identification was especially important due to bycatch of rare and endangered species, especially the endangered Short-tailed Albatross. Today's goal is to achieve high quality training and consistency to more than 400 observers deployed per season. Partnership with COASST allows for leveraging of their seabird expertise and student interns to assist with data entry, preparation of specimens, and a host of related activities.

## National Seabird Program 2017 Team

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**King Penguins. Photo credit: Robert L. Pitman**