Seabird Mass Mortality Event on St. Paul, Pribilofs

Lauren Divine, Co-Director ACSPI ECO
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Day 1 – 39 Carcasses, Mostly Tufted Puffins, Mostly Intact

2 murres

8 adult Horned Puffins

2 juvenile Tufted Puffins

27 adult Tufted Puffins

photograph courtesy of ACSPI Ecosystem Conservation Office
Day 32 – 45 Carcasses, *incl’ing a new species: Crested Auklets*
How Many of Which Species Have Been Found?

- 292 carcasses found
  - 87% Tufted Puffins

- 85% intact

- coming in fast (daily)
- too many for the foxes to eat

photographs: adt TUPU – Tringa Photography, juv TUPU – Terry Sohl, adt HOPU – Lee Rentz, CRAU – Cristophe Gouraud, TBMU – All About Birds, Arctic Fox – ACSPI ECO; data courtesy of ACSPI Ecosystem Conservation Office; graphics by COASST
Tufted Puffin Natural History

- Nests underground in a burrow
- Lays one egg each year
- Deep diver (“flies” underwater)
- Eats small fish like capelin and sandlance
- Winters in the North Pacific

~6,000 Tufted Puffins breeding on the Pribilof Islands

photographs: breeding – Tringa Photography, nonbreeding – All About Birds, juvenile – Terry Sohl, range map – Cornell Lab of Ornithology
Sampling Beaches on St. Paul

COASST regular (blue); Puffin Die-off (red)

map courtesy of Pamela Lestenkof, ACSPI Ecosystem Conservation Office
Which Seabirds Normally Wash Up on St. Paul?

COASST “regular beach” Data

*species unknown

Carcass encounter rates

Species composition

these months

not these months

encounter rate (carcasses km⁻¹)

Mean ER (±95% CI)

All birds

Petrels

Alcids

Larids

months

not

photographs: STSH – Kingfisher Bay Resort and Fraser Island, NOFU – Birdpix, TBMU – Trinja Photography; data courtesy of COASST, ACSPI ECO; graphics - COASST
### How Often are Beached Birds Found?

<table>
<thead>
<tr>
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<th>All Species Combined</th>
<th>Tufted Puffins Only</th>
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<tbody>
<tr>
<td>Normal (Normal)</td>
<td>10 km</td>
<td>140 km (!)</td>
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<tr>
<td>Now (How Many x Normal?)</td>
<td>.22 km</td>
<td>.25 km</td>
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<tr>
<td>How Many x Normal?</td>
<td>~45x</td>
<td>~550x</td>
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Where are Tufted Puffins Found on the Water in Aug-Nov?

North Pacific Pelagic Seabird Database (NPPSD) 1975-2012, courtesy of John Piatt, USGS
What Are the Ecosystem Conditions?

*Ocean Warming in 2016*

**Ice Edge** – *farther north than normal*

![Map showing sea ice extent and concentration](image-url)

Sea Ice Extent and Concentration (%)

- **2016:** Feb 1, Feb 18, Mar 6, Mar 23, Apr 9, Apr 25, May 12, May 29, Jun 15

- **Sea Ice Extent and Concentration**:
  - 90
  - 75
  - 60
  - 40
  - 20

- **Long. 185-194**
- **Lat. 58-64**

Mooring map and sea ice extent data courtesy of Phyllis Stabeno, PMEL, NOAA
What Are the Ecosystem Conditions?

*Ocean Warming in 2016*

**Water Column** – *warmer than normal*

- Depth-Averaged Temp @ M2 (deg C)

**Bottom Temperature** – *warmer than normal*

- Bottom Temp @ M4 (deg C)

Mooring temperature data courtesy of Phyllis Stabeno, PMEL, NOAA
What Are the Ecosystem Conditions?

Ocean Warming in 2016

Sea Surface Temperature Anomaly - 31 Oct 2016

SST data from above: OI v2 AVHRR only; below: NCEP OI v2, both courtesy of Nate Mantua, NOAA
What Are the Ecosystem Conditions?

*lower quality prey for young pollock (and Crested Auklets?)*

**Zooplankton:**

- dominated by small copepods

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Zooplankton data courtesy of Stephani Zador, Elizabeth Siddon, Ivonne Ortiz – Ecosystem Considerations Presentation at BSAI Groundfish Plan Team Meeting, 14 Nov 2016
Summary – What We Know

Seabirds:
- all are Alcids (murres, puffins, auklets)
- most are Tufted Puffins
- both fish-eaters (puffins, murres) and plankton-eaters (Crested Auklets)
- live birds are very close to shore
- carcasses are under-weight, starving
- event is still happening
- geographic extent is unknown

Ocean Conditions:
- Bering Sea is warmer than normal, less ice, no cold pool
- zooplankton (copepods) are smaller than normal, lower quality food
Biologists at the Aleut Community of St. Paul Island Tribal Government Ecosystem Conservation Office (ACSPI ECO) have counted nearly 300 beached seabird carcasses on the island since October 17, 2016. The species found are mostly tufted puffins, but horned puffins, murres, and recently, crested auklets have been found. The current encounter rate (carcasses/kilometer) of puffin carcasses in the past three weeks is more than 350 times the normal rate based on surveys conducted at St. Paul over the past ten years (2006-2015) according to the Coastal Observation and Seabird Survey Team (COASST) and ACSPI ECO. Because only a fraction of birds that die at sea will become beached, and even fewer counted prior to removal by scavengers, the report of nearly 300 seabirds (adults and juveniles) washed up on four monitored beaches at St. Paul Island raises concern.

USFWS Alaska Migratory Bird Management 1011 E. Tudor Rd. Anchorage AK 99503 1-866-527-3358 (phone) AK_MBM@fws.gov November 2016

U.S. Fish & Wildlife Service
Pribilof Islands Seabird Die-off

Carcasses recovered from North Beach, St. Paul Island, Pribilof Islands by Aleut Community of St. Paul Island Tribal Government Ecosystem Conservation Office (ACSPI ECO). Photo credit: ACSPI ECO.

Why Are They Starving?
The causes of the seabird starvation, both of murres and puffins, is unknown but may be linked to changes in prey distribution or abundance due to above average sea surface temperatures (SST). Abnormally high SST were recorded in the Bering, Beaufort and Chukchi Seas in October 2016, as well as record low levels of Arctic sea ice extent.

What Can I Do?
Report sick or dead birds to:
• 1-866-527-3358 or email AK_MBM@fws.gov
• Time & Date
• Exact location (latitude/longitude, length of beach)
• Type of bird (species name or group e.g., murre, puffin, etc.)
• Estimated number of birds
• Photos

Participate in monitoring efforts on your local beaches
The Coastal Observation and Seabird Survey Team (COASST) can connect you with existing citizen science survey teams and provides training in how to identify birds and collect high quality data that are shared with researchers and resource management agencies. Visit www.coasst.org to learn more or contact COASST at 1-206-221-6893 or email coasst@uw.edu.

What’s Happening?
Biologists at the Aleut Community of St. Paul Island Tribal Government Ecosystem Conservation Office (ACSPI ECO) have counted nearly 300 beached seabird carcasses on the island since October 17, 2016. The species found are mostly tufted puffins, but horned puffins, murres, and recently, crested auklets have been found. The current encounter rate (carcasses/kilometer) of puffin carcasses in the past three weeks is more than 350 times the normal rate based on surveys conducted at St. Paul over the past ten years (2006-2015) according to the Coastal Observation and Seabird Survey Team (COASST) and ACSPI ECO. Because only a fraction of birds that die at sea will become beached, and even fewer counted prior to removal by scavengers, the report of nearly 300 seabirds (adults and juveniles) washed up on four monitored beaches at St. Paul Island raises concern.

What Do We Know?
The U.S. Geological Survey National Wildlife Health Center (NWHC) in Madison, WI performed necropsies to determine cause of death of eight of the Pribilof beached puffins. All puffins showed severe emaciation. At this time, no pathogenic bacteria, viruses, or parasites have been identified and the current cause of death of seabirds at St. Paul Island appears to be starvation. These results are similar to murres examined during the 2015-2016 Alaskan seabird die-off.

What You Can Do

*Collect observations* and post to the LEO Network.

*Become trained in a monitoring protocol* as part of BeringWatch and collect regular monthly (given weather) data.
  - join COASST
  - attend the COASST-BeringWatch training at AFE