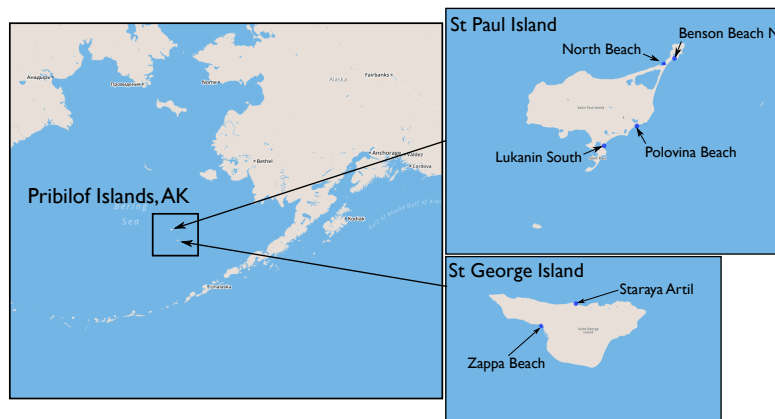


## Mass Mortality of Tufted Puffins



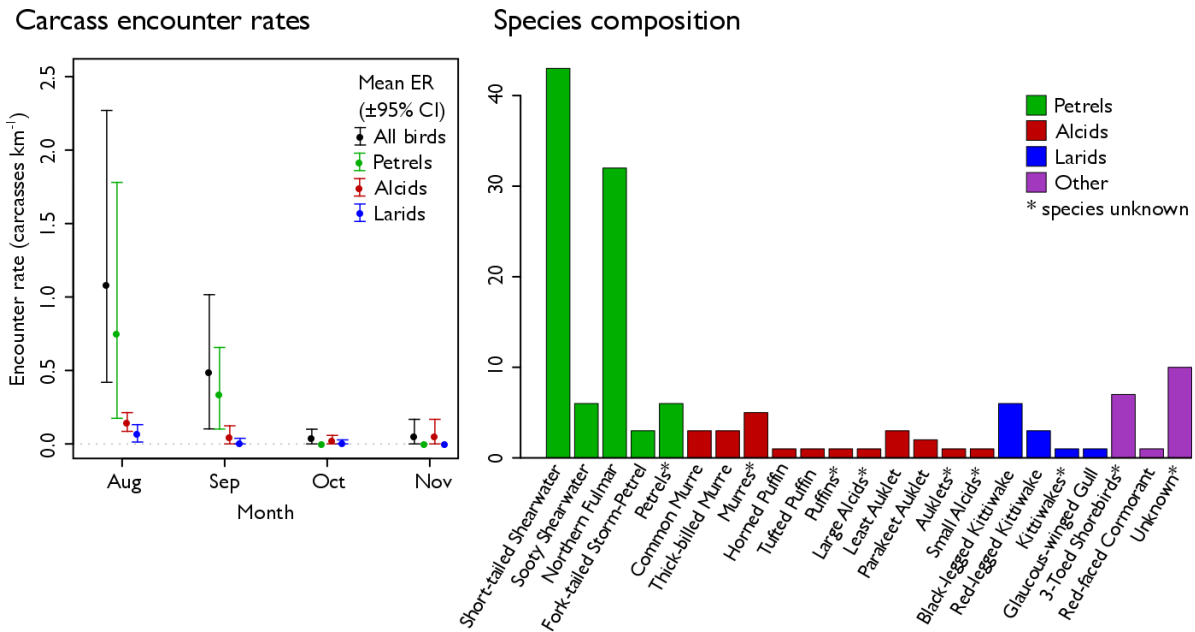
**Figure 1.** Carcasses recovered from North Beach, St. Paul Island, Pribilof Islands by ACSPI ECO. Top left: 2 murrelets, top center: 8 Horned Puffins, bottom two rows: 29 Tufted Puffins, (extreme right: 2 juveniles).

On 17 October 2016, Paul Melovidov and Aaron Lestenkof, biologists from the Aleut Community of St. Paul Island Tribal Government Ecosystem Conservation Office (ACSPI ECO), Pribilof Islands, Alaska (see map) counted 39 fresh, mostly intact beached birds along North Beach (see photo). **Since this date, daily surveys have tallied 247 beached birds on 4 separate beaches on the north and east sides of the island.**



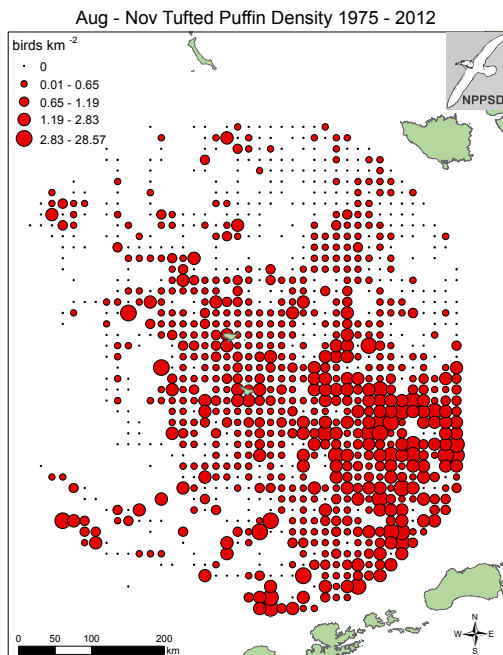
**Figure 2.** Map of the Pribilof Islands within Alaska, along with COASST beach locations on St Paul and St George.

Almost all of the birds found to date have been Tufted Puffins (217), with much smaller numbers of Horned Puffins and murrelets. Previous years' data from both St. Paul and St. George (see graphs) indicate that Tufted Puffins have been a very small minority of the species washing ashore (see graph). In over 10 years (2006 to 2015) and 306 surveys, only 6 puffins (3 Horned, 1 Tufted, 2 unidentified to species) have ever been found. **The current encounter rate (carcasses/kilometer) for Tufted Puffins is over 350-2,500 times the normal rate** (range dependent on use of cumulative average versus maximum survey count).



**Figure 3.** left: The average number of carcasses per km on both St Paul and St George Islands plotted for the months of August to November (2006-2015) indicates that usually less than one carcass would be encountered every 10 km in October. right: Species composition of carcasses across the fall time-period (August to November) from previous years' surveys indicates that carcasses were predominantly petrels (Shearwaters and Fulmars).

During regular COASST surveys of Pribilof Island beaches, only 22% of birds have been found completely intact, indicating most fall victim to a combination of predation and scavenging. In the ongoing mass mortality event, **84% of birds found have been intact** (see photo), indicating these birds did not die from predation, and that they have beached very recently such that biologists found them before scavenging foxes attacked/removed the carcasses.



**Figure 4.** Cumulative sightings of Tufted Puffins from at-sea surveys in the Bering Sea conducted in August through November from 1975 through 2012. All sightings within 300 km of the Pribilof Islands (located in the center of the figure) are plotted. Data from the North Pacific Pelagic Seabird Database (NPPSD).

Post-breeding, Tufted Puffins disperse widely, throughout the Bering Sea, and presumably beyond into the North Pacific. At-sea sightings in the late summer and fall collected over many years (1975-2012; see bubble map) suggest a broad distribution. The current concentration of puffins around the islands is unusual

Population size of puffins breeding in the Pribilof Islands is in the thousands based on USFWS surveys: 6,000 for Tufted Puffins and over 30,000 for Horned Puffins (Beringian Seabird Colony Catalog 2005). ***If the current Tufted Puffin carcass count was 10% of total mortality*** (a high estimate given the small length of beach available on the island in an otherwise open ocean), ***total estimated mortality would amount to one-third of the local nesting population.***

The cause of this mortality is unknown at present. Carcasses transported to the National Wildlife Health Center for post-mortem analysis showed severe signs of emaciation, suggesting an ecosystem shift potentially affecting prey distribution. Tests for avian influenza (bird flu) were negative. Additional tests are pending.

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***Changes from previous version (1.2):***

1. recategorized this event as a mass mortality event
2. focus exclusively on Tufted Puffins as the affected species
3. updated numbers and rates with additional survey information
4. included current encounter rates (carcasses/kilometer) and comparisons with baseline
5. added information on carcasses sent to NWHC
6. added information on the at-sea distribution of Tufted Puffins
7. added comparison information on potential mortality relative to local nesting population
8. added contact information for the Alaska Maritime National Wildlife Refuge and US Geological Survey.