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Presumed Drowning of Aleutian Canada Geese on the Pacific Coast of California and Oregon

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ABSTRACT: Carcasses of 42 and 17 Aleutian Canada geese (*Branta canadensis leucopareia*), a federally listed endangered species, were found on ocean beaches near Crescent City, California, and near Pacific City, Oregon, respectively, following severe storms. Necropsies and other information suggest that the birds were flushed during the storms and somehow entered the water where they were washed into the surf and drowned.

Key words: Aleutian Canada goose, *Branta canadensis leucopareia*, endangered species, mortality, drowning, California, Oregon, case report.

Waterfowl deaths due to drowning have been documented previously along the northern California coast (Wooten, 1954; Denson, 1961). Birds roosting on the open ocean have been swept into the surf where they have been tossed about, gathered sand in their plumage, and eventually died of drowning and hypothermia. Locally, this phenomenon is known as "sanding." The cause of death of approximately 135 tundra swans (*Cygnus columbianus*) at the mouth of the Eel River, 20 km south of Eureka, California, in early January 1984 also was diagnosed as probable drowning after the birds were swept down the river into the surf (Miller et al., 1986). Here we report two instances of presumed drowning of Aleutian Canada geese (*Branta canadensis leucopareia*), a federally listed endangered species.

The first incident occurred 8 to 10 April 1984, when carcasses of 42 Aleutian Canada geese were found along 1.2 km of ocean beach about 8 km north of Crescent City, Del Norte County, California (41°50'N, 124°13'W) (Fig. 1). This location is 8 km north of Castle Rock National Wildlife

Refuge, a 5.2-ha island lying 2.4 km west of Crescent City, on which the geese traditionally roost at night, and 0.8 to 2.4 km northwest of the nearest pastures on the Lake Earl State Wildlife Area north of Crescent City, in which they traditionally feed and rest during the day (Yparra-guirre, 1982). The dead geese were first seen in the latter part of the morning of 8 April 1984. Twenty-one carcasses were collected that day. An expanded search of 19 km of beach produced 18 additional carcasses on 9 April 1984 and three on 10 April 1984. These carcasses may have been missed on the preceding surveys. On 9 April 1984 a weak Aleutian goose was observed flying from the beach onto the ocean where it disappeared from sight.

Three goose carcasses were submitted for necropsy to each of three laboratories: National Wildlife Health Center (Madison, Wisconsin 53711, USA), California Department of Fish and Game Disease Laboratory (Rancho Cordova, California 95670, USA), and Humboldt State University Pathology Laboratory (Arcata, California 95521, USA). The gastrointestinal tracts of 20 additional carcasses were examined for parasites by a student at Humboldt State University.

Gross examination of the nine carcasses revealed that all birds had minor to moderate amounts of sand and small gravel throughout their plumage. The birds had excellent stores of subcutaneous, pericardial and mesenteric fat. Tracheae and bronchi contained fluid; tracheae also contained sand. "Algae-like" particles were observed in histological sections of lung tissue from one of three birds examined.

Lung parenchyma of all nine birds was dark, fluid-filled and had multiple areas of hemorrhage and/or hyperemia. Small amounts of sand were found in the lungs of two birds. The air sacs appeared normal and did not contain excess fluid.

Mucous membranes of the gastrointestinal tracts of all nine birds were congested. Crops and proventriculi were empty while gizzards contained small to moderate amounts of sand plus some plant material in one bird. The small intestines contained thick mucus and, in three birds, digested food.

Lesions suggestive of infectious disease were not present among the nine birds, and lead shot was not recovered from gizzards. Some helminths were present in the gizzards and intestines of the 20 geese examined but these infections were not considered to be detrimental to the birds' health. There were no isolations obtained from the three birds tested for pathogenic viruses (lung, spleen and intestinal tissue placed on duck fibroblasts and in eggs containing chicken embryos), bacteria (swabs from lung, heart, liver and intestinal tissue placed on blood agar) and fungi (swabs from preceding tissue placed on Sabourand's agar). Tests for avian botulism were negative. There was no evidence of poisoning from carbamate or organophosphate pesticides based on brain cholinesterase inhibition test results (Ellman et al., 1961; Ludke et al., 1975). Additionally, there was no indication that death was caused by other heavy metals or by poisons such as strychnine, based on the history of the mortality which is inconsistent with the actions of these materials. This prompted inquiry into weather conditions that may have been a contributory factor to their mortality.

At 0130 hr, 8 April 1984, a cold front, accompanied by strong southwesterly to westerly winds and heavy rain, passed through the general area. Wind and wave data from the immediate areas around Crescent City, California, are not available, but data from the National Weather

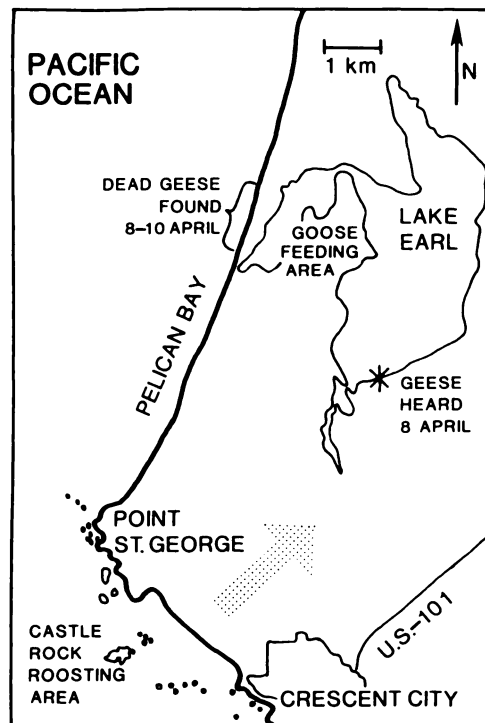


FIGURE 1. Region of northern California coast near Crescent City where carcasses of 42 Aleutian Canada geese were found in 1984. Large arrow indicates approximate wind direction during height of a spring storm.

Service (Eureka, California 95501, USA), 110 km south of the area, and a weather buoy located 25 km west of Eureka indicated peak wind gusts of 58 km/hr and oceanic swells of 4.9 m during the storm. Residents reported that as the storm passed through Crescent City, the winds were considerably stronger than those recorded at Eureka.

A landowner adjacent to Lake Earl, 4 km southeast of where the dead geese were found, heard birds calling excitedly while they were flying around the vicinity of his ranch (Fig. 1) during the height of the storm and throughout the rest of the night. We speculate that the geese may have been frightened off Castle Rock by the pounding surf or other factors and flew to the mainland. Possibly while attempting to cross from the island, circling the vicinity of Lake Earl or attempting to return to

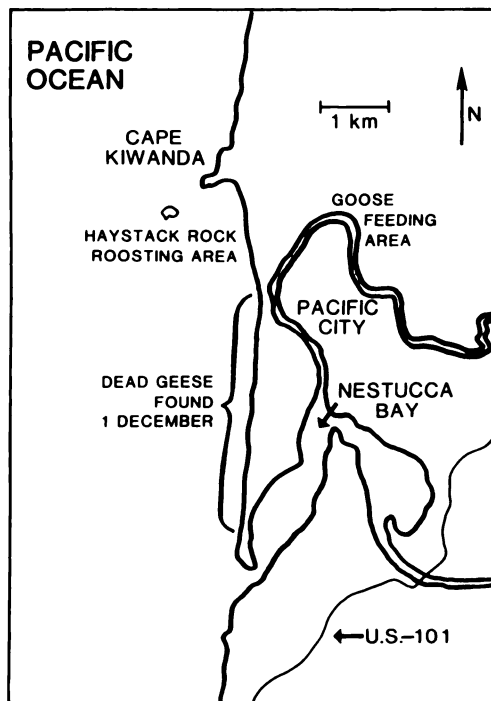


FIGURE 2. Region of northern Oregon coast near Pacific City where carcasses of 17 Aleutian Canada geese were found in 1986.

Castle Rock in the face of the storm, they either were forced into the ocean by the strong wind, high waves, or breakers or they alighted on the ocean surface and were washed into the surf where they drowned. It is improbable that the geese were swept off Castle Rock by heavy seas breaking around the perimeter and carried northward, even though the coastal current at that time of year flows in that direction. The fact that the birds would have had to drift 8 km around Point St. George to the beach where they were found and the fact that they all were found along only a 1.2-km stretch of shore suggests, rather, that they died together near the site where they were deposited.

On the basis of (1) sand and plant material in the respiratory tract, (2) fluid in the lungs with accompanying hemorrhage and/or hyperemia, (3) the sudden localized appearance of the dead geese along the ocean beach, (4) the absence of any

apparent health problems as evidenced by good physical condition of the birds, and (5) no indication of disease, poisoning or significant parasitism, we conjecture that these geese may have died from drowning.

The second incident occurred in late November 1986 and involved a small group of Aleutian Canada geese (Shields and Wilson, 1987) that winters in Tillamook County, Oregon (Hatch and Hatch, 1983). These birds roost at night on Haystack Rock (45°13'N, 123°59'W), a 1-ha island within the Oregon Islands National Wildlife Refuge, lying 1 km west of Pacific City. During the day they fly 3 km to the east to feed and loaf in pastures behind Pacific City (Fig. 2). The population peaked at 131 on 6 November 1986 and stabilized at 129 thereafter through 25 November 1986. In the 6-day period to 1 December 1986 the flock size declined to 106 birds. A search of current and historical use areas during the next several weeks failed to reveal the missing birds including two that were banded. On 30 January 1986 a report was received from the Bird Banding Laboratory (Laurel, Maryland 20708, USA) that one of the banded birds had been recovered dead on the beach at Pacific City. Further inquiry revealed that this bird and 16 other dead geese had been found at the high tide debris line along a 3.6-km stretch of ocean beach on the spit adjacent to and south of Pacific City on the morning of 1 December 1986. No physical injuries or signs of shooting were seen in these birds. They appeared to be fresh except that scavenging by gulls (*Larus* spp.) and American crows (*Corvus brachyrhynchos*) was evident on a few carcasses. Specimens were not retained and none were located when the beach was searched on 4 February 1986. The other six missing geese were never found.

Data received from the National Oceanic and Atmospheric Administration (National Climatic Data Center, Asheville, North Carolina 28801, USA) and from the Climatic Research Institute Office of the State Climatologist (Oregon State Univer-

sity, Corvallis, Oregon 97331, USA) revealed that a series of storms passed over the Oregon coast during the last week of November 1986, producing heavy rainfall and high winds with gusts exceeding 129 km/hr. A frontal system moved onshore on 29 November 1986 and was followed quickly by another very slow moving system that was present from 30 November to 1 December 1986. Precise data on sea conditions during the period are not available; however, personnel of the Tillamook Bay U.S. Coast Guard Station (Garibaldi, Oregon 97118, USA), 42 km north of Pacific City, reported extremely high waves estimated at 4 to 7 m on the morning of 30 November 1986. They stated further that such severe conditions occur only once or twice per year during winter storm periods.

Because of our knowledge of the habits of this flock of geese derived through 8 yr of observations, the similarity in the circumstances of this incident to those of previous reports of drowning, including the weather and sea conditions described above, and the location and relatively fresh condition of the goose carcasses when found, we conjecture that the 23 Aleutian Canada geese also were involved in a surf drowning accident. The evidence suggests that the incident may have occurred during the period of 29 to 30 November. We surmise that for unknown reasons, as in the case of the birds at Castle Rock, the geese entered the water and succumbed while flying from, or to, Haystack Rock.

Doubt has been expressed by some that birds adapted for an aquatic existence can drown. In almost all reported cases of drowning, the species involved have been surface feeding waterfowl. Field observations indicate that, during heavy seas, diving birds such as scoters (*Melanitta* spp.), loons (*Gavia* spp.) and cormorants (*Phalacrocorax* spp.) escape from being caught in large waves by plunging below them just before they break, thereby avoiding their main force.

We express appreciation in the incident

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