

PELAGIC RECORDS OF GLAUCOUS-WINGED AND HERRING GULLS IN THE NORTH PACIFIC OCEAN

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GLAUCOUS-WINGED GULLS (*Larus glaucescens*) and Herring Gulls (*L. argentatus*) have been sighted sometimes hundreds of miles offshore in the eastern North Pacific Ocean. Yocom (1947) saw both species out to 500 miles off California and Sanger (1965, 1970) noted them to nearly 600 miles off Washington and Oregon, but no pelagic specimens of either species existed (A.O.U., 1957). This paper documents the first pelagic specimen records of these species off the Pacific Coast of North America; it discusses concurrent pelagic sightings and summarizes the literature on prior pelagic sightings. Both species are much more pelagic than was previously suspected.

METHODS

I observed and collected gulls during oceanographic cruises as follows: From 2 February through 7 March 1967 I logged 90 hours of observations aboard the RV 'T. G. Thompson' (University of Washington Department of Oceanography) in the Gulf of Alaska. From 26 January through 17 February 1969 I observed for 70 hours aboard the RV 'Miller Freeman' (U. S. Bureau of Commercial Fisheries, now the National Marine Fisheries Service) off northern and central California, and from 21 June through 8 August 1969, I observed for 177 hours as the 'Freeman' steamed across the southern Gulf of Alaska and off the Aleutians, especially due south of Adak Island. Most of the specimens (Table 1) were collected by shooting birds flying over or near the moving ship. I tried to get birds representative of gull species and plumages seen as far offshore as possible, but collecting was otherwise random. Specimens were frozen intact on shipboard and study skins were prepared ashore later, at which time stomachs were preserved in formalin.

Observation periods (transects) averaging 1.5 hours each were maintained as the ship was moving, except for the area south of Adak Island, when they were made as the 'Freeman' drifted with a salmon gillnet. Figure 1 shows the midpositions of the transects. The gulls following the ship were counted at irregular intervals during a transect but usually at least two or three times per hour. Non-followers were counted as they were seen. I allowed for the ship-following habits of the gulls by assuming that the total number present along a transect was the number following when the transect began (or the number first seen) plus all subsequent net increases in numbers following. For example, if 10 were seen initially, followed by counts of 11, 12, 8, 10, and 9, the total number would be 14. This method neglects the possibility of exfollowers rejoining the ship, or that turnover of individuals following the ship may occur. Units of birds seen per hour (birds/hour) were calculated for adults and immatures (any birds not in full adult plumage) for each transect.

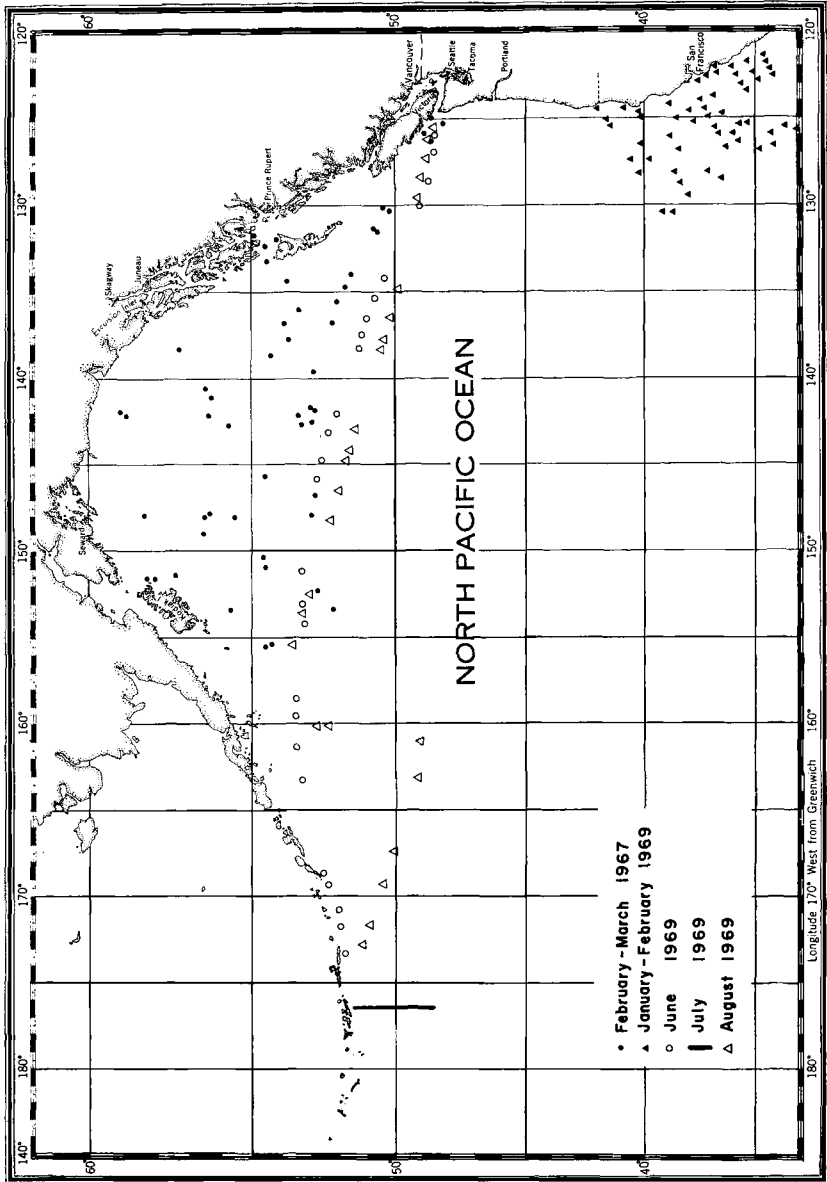


Figure 1. Locations of observations of seabirds in the eastern North Pacific Ocean. Symbols indicate midpositions of transects, as the ship steamed a straight line.

TABLE 1
DATA ON PELAGIC GLAUCOUS-WINGED AND HERRING GULLS
FROM THE NORTH PACIFIC OCEAN

| Specimen number ¹ | Date | Age, sex | Body wt (g) | Position | | Body fat |
|---------------------------------------|--------------|-----------|-------------|----------|-----------------------|-------------------|
| | | | | N | W | |
| <i>Larus glaucescens</i> | | | | | | |
| 26205 | 16 Feb. 1967 | 4th yr. ♂ | — | 56° 30' | 140° 35' ² | Heavy |
| 26391 | 6 Feb. 1969 | 3rd yr. ♀ | 1,111 | 36° 17' | 126° 30' ³ | No data |
| 26510 | 7 July 1969 | 3rd yr. ♀ | 1,151 | 51° 00' | 176° 22' ⁴ | No data |
| <i>Larus argentatus smithsonianus</i> | | | | | | |
| 26206 | 7 Mar. 1967 | Adult ♀ | — | 48° 53' | 126° 20' ⁵ | Heavy |
| 26390 | 1 Feb. 1969 | Adult ? | 1,052 | 38° 26' | 126° 48' ⁶ | Light to moderate |
| 26389 | 16 Feb. 1969 | Adult ♀ | 1,000 | 32° 56' | 125° 11' ⁷ | Light |

¹ Burke Memorial Washington State Museum.

² 160 nautical miles southwest of Chichagof Island.

³ 210 nautical miles west-southwest of Pigeon Point, California.

⁴ 45 nautical miles south of Adak Island (Aleutians), Alaska.

⁵ 23 nautical miles southwest of Clayoquot Sound, Vancouver Island.

⁶ 153 nautical miles west-southwest of Point Arena, California.

⁷ 252 nautical miles west-southwest Point Conception, California.

RESULTS

Table 1 lists data pertinent to the specimens, which were all in good condition. For the two winter cruises, Figure 2 presents mean values of birds/hour for adults and immatures of both species seen at various distances offshore. All records of *L. glaucescens* and *L. argentatus* are summarized below, along with other pertinent information.

Gulf of Alaska, winter.—Of the 310 *glaucescens* observed in February-March 1967 (Figure 2), 69 percent (214 birds) were adults. Although lone adults and immatures were seen at respective distances of 300 miles and 175 miles offshore, 79 percent of the adults (170 birds) and 96 percent of the 97 immatures (93 birds) were seen within 100 miles of shore. High local densities (single transect) were 33.3 birds/hour (30 birds) each for adults and immatures at a position 83 miles offshore.

The 55 adult and 53 immature *argentatus* seen showed much less tendency than *glaucescens* to occur far offshore; 91 percent of the adults (50 birds) and 96 percent of the immatures (51 birds) were within 100 miles of shore, although individuals of each were noted 270 miles out. The largest local concentrations, 6.4 adults/hour (9 birds) and 9.1 immatures/hour (10 birds) occurred within 15 miles of land. Comparatively, *glaucescens* outnumbered *argentatus* by a wide margin—adults by 4.5:1 and immatures by about 2:1. One night within about 60 miles of the Kenai Peninsula, unidentified gulls followed the ship

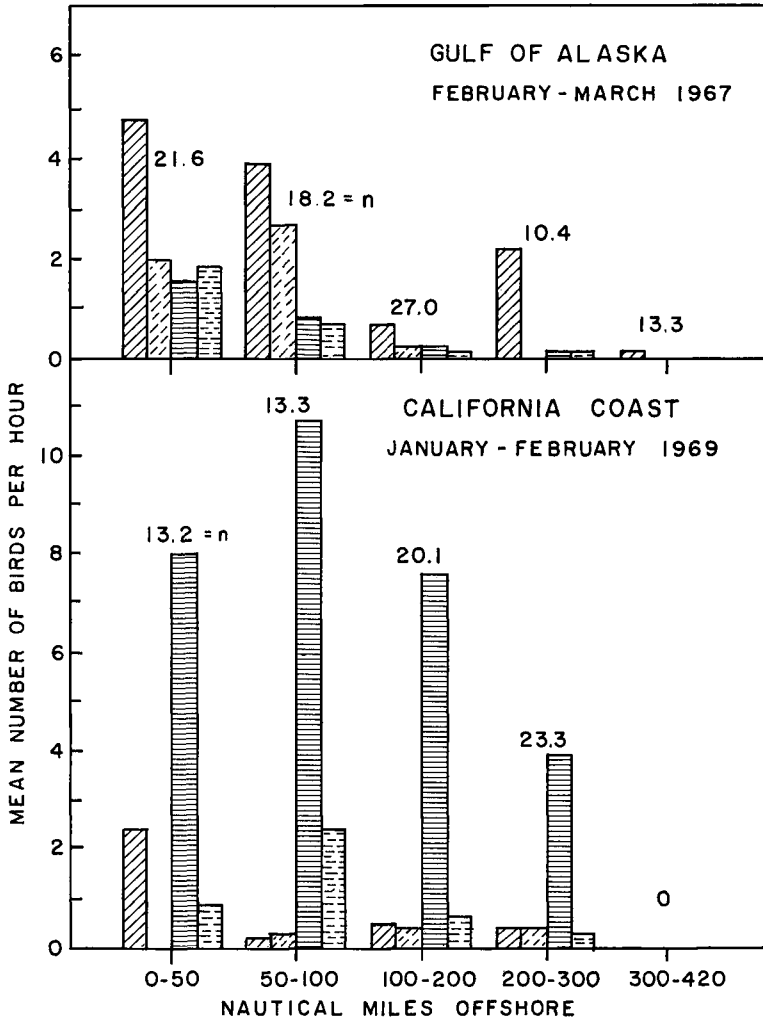


Figure 2. Comparative mean winter densities of immature and adult *Larus glaucescens* and *L. argentatus* as they were observed within distance intervals offshore in the Gulf of Alaska, 2 February-7 March 1967 and off the California coast, 26 January-17 February 1969. Diagonal lines = *L. glaucescens* and horizontal lines = *L. argentatus*; solid lines = adults, dashed lines = immatures. n = total hours observed in each distance interval, including watches with "zero counts" of gulls.

continuously between 20:00 and 24:00. No increase in the numbers of either species was apparent between morning and late afternoon.

California coast, winter.—Of the 76 *glaucescens* seen in January-February 1969 (Figure 2), 71 percent (54 birds) were adults. Although

37 percent (20 birds) were seen more than 100 miles out, density generally decreased with distance offshore. The distribution of the 22 immatures was more to seaward: None was seen within 50 miles of shore (although immatures were probably close to shore during the time of the cruise), and 82 percent (18 birds) were more than 100 miles offshore. Two immature and one adult *glaucescens* were seen at the western cruise limits, 300 miles offshore. The largest local concentrations were 16.7 adults/hour (10 birds) at 25 miles out and 1.2 immatures/hour (one bird) at 180 miles out. Adults had a relatively northerly distribution, with none seen south of the latitude of Monterey Bay; immatures were more evenly distributed but were nowhere abundant. No observing was done at night, but one adult *glaucescens* was seen in the ship's working lights during a nighttime oceanographic station 45 miles west of Cape Mendocino.

Of the 552 *argentatus*, adults far outnumbered immatures, making up 89 percent (491 birds) of the species seen. Adults and immatures were common to the western cruise limits, although density decreased with distance from shore; 29 percent of the adults (142 birds) were in the 50–100 mile interval and 50 percent (244 birds) total occurred in the 100–300 mile intervals. Immature *argentatus* showed a more coastal distribution; 51 percent (32 birds) were in the 50–100 mile interval and only 33 percent (21 birds) in the 100–300 mile intervals. The largest local density of adults, 33.3 birds/hour, occurred at positions 60 (20 birds) and 105 miles (50 birds) offshore. *L. argentatus* displayed a fairly uniform latitudinal distribution, although most occurred south of the latitude of San Francisco. *L. argentatus* outnumbered *glaucescens* more than sevenfold; adult *argentatus* constituted 78 percent of the 628 birds seen of both species. Neither species increased in abundance from morning to afternoon hours.

Although at least a few *glaucescens* and *argentatus* always followed when we were within sight of land, some individuals seen there seemed to pay no attention to the ship. In sharp contrast, when the ship was well offshore they were either following the ship or heading directly toward it from some distance away. The only times they actually fell behind was when garbage was dumped overboard.

A nominal four other *Larus* spp. were identified off California, but were rare or had relatively restricted distributions. Three immatures with very light plumage and bills pinkish basally noted at distances of 75, 220, and 250 miles offshore I tentatively identified as Glaucous Gulls (*L. hyperboreus*). In view of the fact that this species has recently been seen in the San Francisco Bay area (Baldrige and Chandik, 1969: 516), it is not unreasonable to assume that it occasionally wanders off-

shore from California, or perhaps wanders southward at sea from farther north. Adult Western Gulls (*L. occidentalis*) were quite common within 50 miles of shore (338 birds), where they widely outnumbered even Herring Gulls (105 birds). The average density was 27.2 birds/hour; most of these were within about 30 miles of land, including a particularly dense concentration of 500 birds/hour (300 birds, mostly in one large, extensive flock) 25 miles off San Francisco Bay. Numbers dropped markedly to seaward, and 60 miles was the maximum distance offshore the species was seen. An adult Thayer's Gull *L. thayeri* (= *L. argentatus thayeri* of some authors) was seen 20 miles off extreme northern California; the simultaneous presence of several adult *argentatus* afforded a good comparison. Adult California Gulls (*L. californicus*) were seen infrequently (12 birds, up to a maximum local density of 4.5 birds/hour) within 25 miles of the coast between Point Reyes and Monterey Bay. In addition, unidentified immature *Larus* spp., which could have been any of the above species, were frequently seen close to shore.

Southern Gulf of Alaska, summer.—In contrast to the above observations, no *glaucescens* were seen off Vancouver Island or in the southern Gulf in June and August 1969. Within 50 miles of the Aleutians the species was seen infrequently (21 birds), up to a maximum density of 4.7 birds/hour. Probably if the ship had traveled within a few miles of the islands, I would have seen more gulls. In August I saw three adult *argentatus* within 50 miles of Vancouver Island, the only individuals of the species met with between 21 June and 8 August.

South of Adak Island, summer.—*L. glaucescens* were common in this area throughout July 1969. In contrast to the above records, most of the observing here was done as the ship drifted. In 35.2 hours of observing within 50 miles of the island, the density averaged about 8 birds/hour (283 birds); a maximum density of 140 birds/hour (70 birds) was noted on 9 July. The density dropped off sharply beyond 50 miles. Only one bird (adult) was seen farther than 65 miles south, at 184 miles south. A striking feature was the scarcity of immature birds, only 6, less than 2 percent of the observed population being seen throughout the month. Very close to shore in Adak Bay they were more plentiful, but were still fewer than adults. Curiously *L. glaucescens* showed very little ship attraction behavior during this cruise.

Pelagic food habits.—The stomach content data from the specimens listed in Table 1 are scanty (stomachs of Nos. 26510 and 26206 were empty), but they nevertheless offer clues to these species' food habits while far from land:

L. glaucescens, No. 26205: small (2–3 mm) pieces of "shell."

L. glaucescens, No. 26391: shell remains of *Lepas* sp. barnacle, one *Idotea*

TABLE 2
SUMMARY OF *LARUS GLAUCESCENS* AND *L. ARGENTATUS*
INTERSPECIES OCCURRENCES DURING OBSERVATIONS ON WINTER CRUISES

| Area | Occurrences during transects | | | | | | | |
|------------------------------------|------------------------------|------|-------------------|------|-----------|------|--------------|------|
| | <i>L. g.</i> only | | <i>L. a.</i> only | | Both spp. | | Neither spp. | |
| | No. | % | No. | % | No. | % | No. | % |
| Gulf of Alaska (52 transects) | 12 | 23.1 | 3 | 5.8 | 19 | 36.5 | 18 | 34.6 |
| California coast (55 transects) | 1 | 1.8 | 31 | 56.4 | 22 | 40.0 | 1 | 1.8 |

rufescens Fee (isopod), two apple seeds, and unidentified animal tissue.

L. argentatus, No. 26390: remains of *Lepas* sp. shells, one 1-cm *Mytilus* sp. shell, three 0.5–1.5-cm wood chips.

L. argentatus, No. 26389: throat, gullet, and stomach were crammed full of the pelagic barnacle *Lepas antifer*, four *Planes* sp. (crab) megalopae, one *Janthina* sp. (pelagic gastropod) shell.

The commonest items in the stomachs were pelagic gooseneck barnacles (*Lepas* sp.) and their remains, while fish and squid remains were conspicuously absent. I once saw an adult *glaucescens* picking at a barnacle-encrusted glass fishing net float during the California cruise; presumably it was eating the barnacles. Possibly the crab megalops, the *Janthina* snail, the isopod, and the mussel were on or near the floating substrate of the barnacles and were only ingested incidentally.

Species associations.—Table 2 summarizes the degree to which *glaucescens* and *argentatus* were observed together during the winter cruises. The species frequently intermingled, although *glaucescens* was seen by itself almost 25 percent of the time in the Gulf of Alaska, and *argentatus* was noted alone more than 50 percent of the time off California. It is unknown whether or not the two species actively associate with each other; they have been recorded together before far at sea (Yocom, 1947; Sanger, 1965), although *argentatus* seems to stay in pelagic regions longer than *glaucescens* (Sanger, 1970).

Wind conditions.—It is difficult to determine the influence of winds on the distribution of gulls. There is no way of knowing how long the birds seen had been at sea; they could have been there several weeks or only a few days or even hours. Immediately before and during both winter cruises, winds were more or less normal (daily Northern Hemisphere Surface Charts, National Meteorological Center, Washington, D. C.): onshore or southerly winds or calm conditions prevailed between

TABLE 3
SUMMARY OF PELAGIC SIGHTINGS OF GLAUCOUS-WINGED AND HERRING GULLS FROM THE NORTH PACIFIC OCEAN.

| Date | Position | | Distance (nautical miles) and direction from nearest land | Remarks | Authority |
|---|--|----------------------|---|---|--|
| | N | W | | | |
| <i>Larus glaucescens</i> 11 Feb. 1945-19 Mar. 1945 | 34° 00' | 131° 31' | 500 mi SW San Francisco | 4 imm. in period | Yocom, 1947 |
| Oct. 1952-Mar. 1953 and Oct. 1953-Mar. 1954 Feb.-Mar. 1963 | Adults followed ship "all the way across" on Great Circle Route, Vancouver, B. C., Canada to Yokohama, Japan | | | | Poole, 1966 |
| Dec. 1963 | 45° 20' | 130° 00' | 250 mi W Oregon coast | "Several" adults and imm. seen between coast and this position | Sanger, 1965 |
| | 46° 46' | 138° 45' | 600 mi W Washington coast | "Several" adults and imm. seen between coast and this position | Sanger, 1965 |
| Winters of 1962-63, 1963-64, and 1964-65 | Leeward Hawaiian Islands | | | Absent 1963-1964; seen regularly other winters. GWG-HG ratio 1:8 in 1962-63 and 2:1 in 1964-65 | Sibley and McFarlane, 1968; Clapp and Woodward, 1968 |
| 11-28 Jan. 1965 | 47° 30' | 140° 45' | 610 mi off Washington | Common between coast and this position | Sanger, 1970 |
| 3-18 Nov. 1965 | 45° 20' 47° 30' | 140° 00' 140° 15' | 600 mi off Oregon and 570 mi off Washington | Common between coast and these positions | Sanger, 1970 |
| <i>Larus argentatus</i> 24 Feb. 1945 to 19 Mar. 1945 10 Apr. 1945 to 1 May 1945 Feb.-Mar. 1963 | 34° 00' 34° 40' | 131° 31' 129° 50' | 500 mi SW San Francisco 400 mi SW San Francisco | Up to 25 at any one time; adults and imm. A "few" seen; sporadic occurrence | Yocom, 1947 Yocom, 1947 |
| 15-28 Oct. 1964 | 45° 20' | 130° 00' | 250 mi W Oregon | "Several" adults and imm. seen between coast and this position | Sanger, 1965 |
| 11-28 Jan. 1965 | 45° 20' 45° 30' | 132° 00' 140° 45' | 325 mi off Oregon 610 mi off Washington | Scattered between coast and this position; max. seen at once: 10 Seen between coast and this position; regular, but $\frac{1}{4}$ as abundant as <i>L. glaucescens</i> | Sanger, 1970 Sanger, 1970 |
| 14-28 Apr. 1965 | 45° 20' | 136° 15' | 436 mi off Oregon | A few scattered between coast and this position | Sanger, 1970 |
| 3-18 Nov. 1965 | 45° 20' 47° 30' | 140° 00' 140° 15' | 600 mi off Oregon and 570 mi off Washington | Common between coast and these positions | Sanger, 1970 |

southeastern Alaska and California. Winds blew toward the North Pacific from the Alaska Peninsula-Aleutian area.

DISCUSSION

The present records, and those in the literature (summarized in Table 3), suggest that *L. glaucescens* and *L. argentatus* occur far offshore in the North Pacific too frequently and in too large numbers to be just casual. The preponderance of adults suggests that the occurrence is the result of an active movement away from land and not merely random wandering by inexperienced immatures or from wind drifting, as suggested for these species for the Leeward Hawaiian Islands (Sibley and McFarlane, 1968).

Offshore winds prevail over much of the Asian Pacific coast in winter, but onshore or southerly winds prevail over most of the Pacific coast of North America except for the Alaska Peninsula-Aleutian Island area. Wind conditions along the central and southern California coast are often calm in winter. As noted above, winds followed the norm during and immediately prior to the two winter cruises reported here. Thus the gulls I saw far off California probably flew against the winds or moved offshore in calm weather. Possibly some *glaucescens* wind-drifted into the Gulf of Alaska or even all the way to California from the Aleutians or the Alaska Peninsula, but it seems more probable that they originated on land adjacent to the cruise areas.

The absence of *L. occidentalis* and *L. californicus* far off California in January-February 1969 suggests an active offshore movement by *glaucescens* and *argentatus*; if gulls were blown randomly far out to sea, one would expect all coastal species to occur far offshore. As noted above, *occidentalis* was the most plentiful gull close to the California coast, yet none were seen farther than 60 miles offshore. *L. argentatus* was still seen in an average density of greater than 13 birds/hour at this distance offshore. Once *argentatus* is far offshore and high winds do come up, the gull's reaction seems to be one of avoiding the high winds as much as possible; it stays on the water, rather than attempting to reach land (Sanger, 1970).

The question remains why these gulls would fly actively far offshore in winter. The answer perhaps lies partly in the food habits of various individuals. Some may learn to feed from ships' galley scraps better than others. This could explain why, when the ships were near shore, some gulls ignored the ship while others of the same species were steadily following it. The offshore gull populations may represent those individuals who have developed the habit of scavenging galley scraps from moving ships. After their young are fledged, parent birds lose their

chief motivation for staying near land and begin to follow ships offshore. The fact that *Lepas* barnacles were a common food item shows that the gulls are able to utilize a natural food, once far offshore. Furthermore, in eating *Lepas*, they are occupying a feeding niche not utilized (so far as known) by other seabird species.

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