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OCURRENCE AND DISTRIBUTION OF PACIFIC WHITE-SIDED DOLPHINS (*LAGENORHYNCHUS OBLIQUIDENS*) IN SOUTHEASTERN ALASKA, WITH NOTES ON AN ATTACK BY KILLER WHALES (*ORCINUS ORCA*)

In 1991, 1992, and 1993 we conducted line-transect surveys in southeastern Alaska aboard the NOAA ship *John N. Cobb* to obtain population data on harbor porpoises (*Phocoena phocoena*) and killer whales (*Orcinus orca*). Major inland waterways from Juneau to Ketchikan, Alaska, were surveyed (Fig. 1). All cetaceans observed were recorded.

Although a number of cetacean species occur in the inland waterways of southeastern Alaska, only two small cetaceans are thought to commonly inhabit this region: the harbor porpoise and Dall's porpoise (*Phocoenoides dalli*) (Leatherwood *et al.* 1982). During our 1991–1993 surveys, the seasonal occurrence of Pacific white-sided dolphins (*Lagenorhynchus obliquidens*) was also noted. Although Pacific white-sided dolphins are considered one of the most widely distributed delphinids in the eastern North Pacific (Leatherwood *et al.* 1984), few records exist describing their occurrence in the inland waters of southeastern Alaska. Leatherwood *et al.* (1984) examined the National Marine Mammal Laboratory's (NMML) sightings database for the years 1949 to 1979. For southeastern Alaska, sightings of Pacific white-sided dolphins occurred primarily off the outer coast or in inland waterways near entrances to the open ocean. When reviewing the most recent sightings available from NMML's Platform of Opportunity (POP) database (1980–1991), updating the records reported in Leatherwood *et al.* (1984), three records (all in April) were found documenting the presence of Pacific white-sided dolphins within the inland waters of southeastern Alaska (Fig. 2). Since most sightings from the POP database have been collected opportunistically and either (1) no attempt was made to quantify effort, or (2) differential effort may have occurred among areas, it is difficult to ascertain past abundance and seasonal distribution of this species in southeastern Alaska. Interviews conducted with long-term residents of southeastern Alaska and with other biologists working in the area indicated that sightings of Pacific white-sided dolphins within inland waters were a rare event.

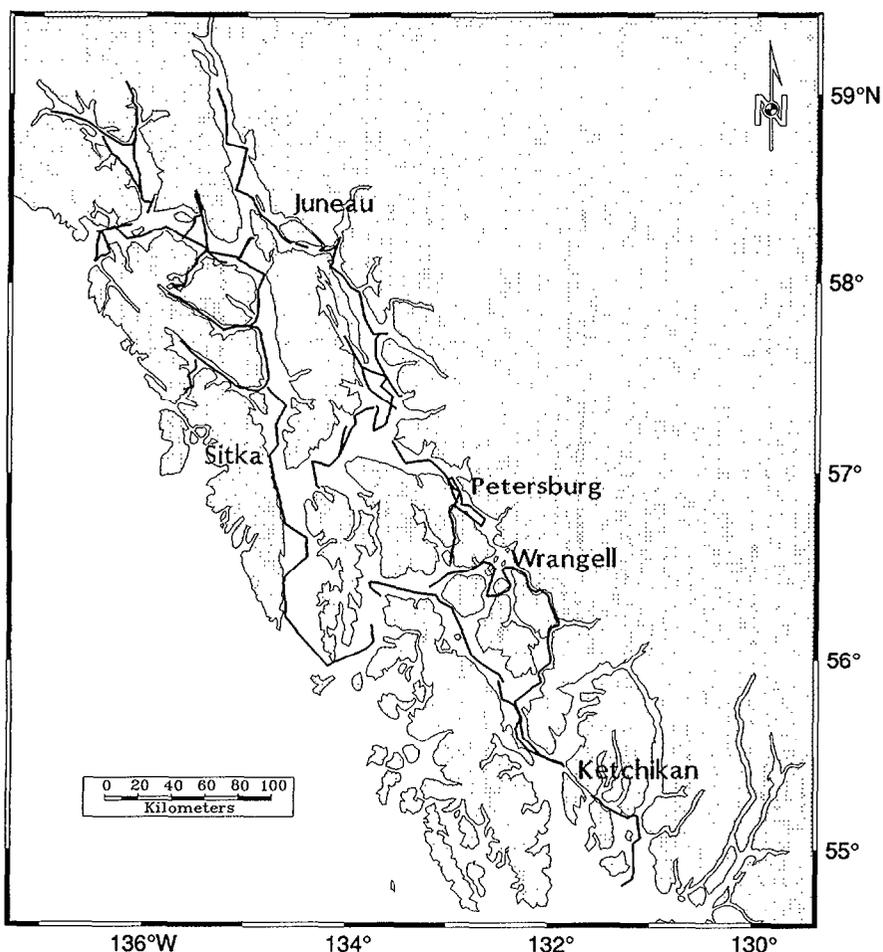


Figure 1. General vessel trackline of NOAA ship *John N. Cobb* during the 1991/1992/1993 cetacean surveys in southeastern Alaska.

During 1991, 1992, and 1993 surveys (representing 9 cruises), the occurrence of Pacific white-sided dolphins varied by season, with most sightings recorded in April (7 sightings) and May (44 sightings). Four sightings were recorded in June and none during July or September (Table 1). Group size estimates ranged from 1 to 500 animals. In April 1991, Pacific white-sided dolphins (6 sightings representing 85 animals) were seen in lower Chatham Strait and in the waters just south of Ketchikan (Fig. 3). Both of these areas are contiguous with the open ocean. In May 1992, 29 sightings (representing 1,291 animals) were recorded for areas far within inland waters (Fig. 3). In Frederick Sound (57°05.6'N, 134°04.3'W) on 10 May 1992, a group of approximately 500 Pacific white-sided dolphins was encountered. The bodies of most of these animals were light green to yellowish in color, perhaps due to algae or diatoms. In May 1993, 15 sightings (520 animals) were observed within inland waters (Fig. 3).

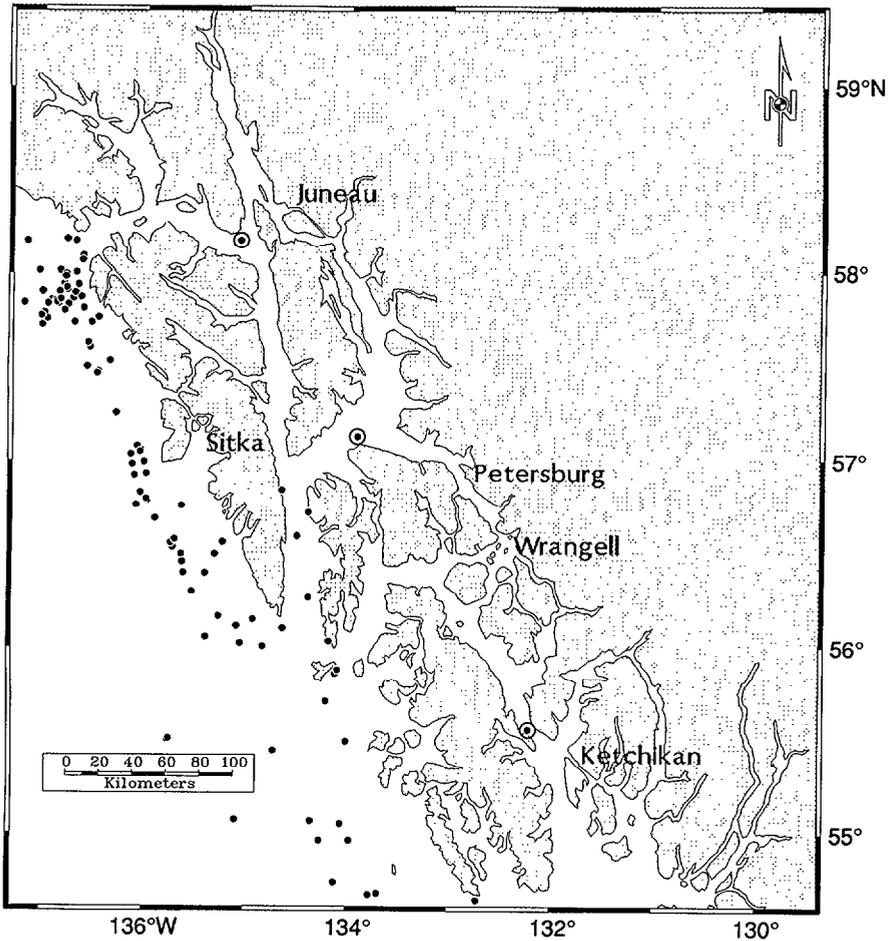


Figure 2. Sightings of Pacific white-sided dolphins from the National Marine Mammal Laboratory's Platform of Opportunity program for the years 1952 to 1991 (includes sightings data published by Leatherwood *et al.* 1984). ⊙ = sightings occurring within inland waters.

Based on previously published and unpublished reports, the number of Pacific white-sided dolphins observed during May 1992 ($n = 1,291$) and May 1993 ($n = 520$) was considerably higher than expected, and it was unexpected to find the dolphins so far within inland waters. Surprisingly, the number of Pacific white-sided dolphins observed in the spring of 1992 and 1993 outnumbered the sightings of Dall's porpoise, an abundant species. The encounter rate of 0.015 groups/km for Pacific white-sided dolphins during our April/May 1992 survey and 0.009 groups/km for our April/May 1993 survey was significantly higher than for our other seven cruises (Table 1). Leatherwood *et al.* (1984) noted that the seasonal occurrence of Pacific white-sided dolphins in the Gulf

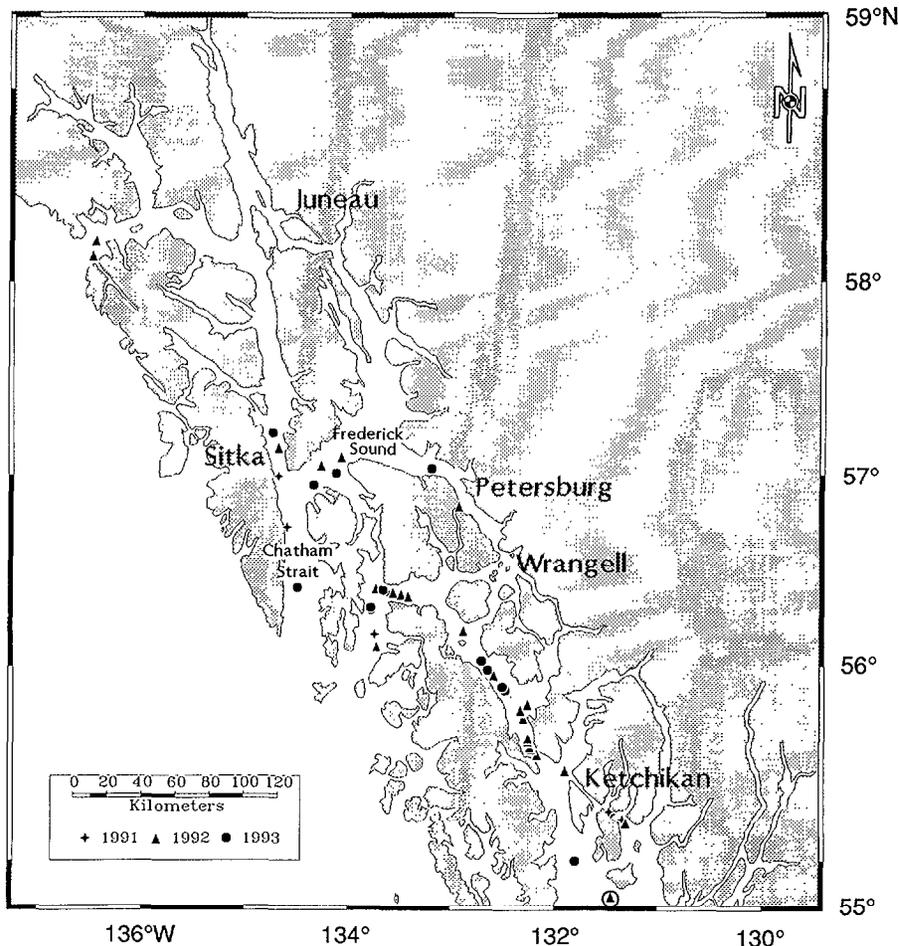


Figure 3. Sightings of Pacific white-sided dolphins during dedicated cetacean surveys aboard the NOAA vessel *John N. Cobb* during 1991 through 1993. ⊙ = location of killer whale predation on Pacific white-sided dolphins.

of Alaska may only occur during warm-water years. In spring 1992 sea-surface temperatures near Juneau were slightly warmer (1°C) than the long-term mean value of 13°C. Sea-surface temperatures in the spring of 1993 were two to three degrees higher than long-term mean values (Bruce Wing, Alaska Fisheries Science Center, Juneau, AK, personal communication, 4 January 1994). Sea-surface temperatures for both years were within normal range by July. The warm-water conditions documented for southeastern Alaska during 1992 and 1993 may have been responsible for the increased number of Pacific white-sided dolphins seen during our spring survey.

On 7 May 1992 we witnessed killer whale predation on Pacific white-sided dolphins. Killer whales are known to prey on whales, dolphins, seals, fish, squid,

Table 1. Encounter rates of Pacific white-sided dolphins during the 1991, 1992, and 1993 surveys aboard the NOAA vessel *John N. Cobb* in southeastern Alaska.

Date	Km surveyed	No. sightings	Encounter rate (groups/km)
20 April–3 May 1991	1,867	6 (85 animals)	0.003
15–25 July 1991	1,959	0	0.000
12–19 September 1991	599	0	0.000
20 April–12 May 1992	1,953	30 (1,292 animals)	0.015
11–23 June 1992	1,883	2 (39 animals)	0.001
10–24 September 1992	1,141	0	0.000
30 April–13 May 1993	1,621	15 (520 animals)	0.009
7–19 June 1993	1,992	2 (22 animals)	0.001
23 September–3 Oct 1993	1,156	0	0.000

turtles, and birds (Jefferson *et al.* 1991); however, this is the first reported observation of killer whales taking Pacific white-sided dolphins. Fifteen killer whales were spotted near Club Rocks (southwest of Ketchikan—Dixon Entrance; 54°49.2'N, 131°14.1'W). The group consisted of 4 adult males, 8 adult females or subadult males, and 3 juveniles. The whales were later identified from photographs as members of the AM1, AM30, AA, and S3 transient pods (Bigg *et al.* 1987, Ellis 1987). The killer whales were first seen at 1100 moving in a westerly direction at a speed of approximately 9 km/h. This course brought the whales close to a group of approximately 250 Steller sea lions (*Eumetopias jubatus*) hauled-out on West Rock. The whales appeared to slow down as they passed the haul-out but then resumed their westerly course. The whales were then observed to increase their swimming speed and break into smaller groups of 3–5 whales. At about this time five or six Pacific white-sided dolphins were seen heading for our research vessel. Moments later an adult killer whale (tentatively identified as the female known as AA2) breached directly off the ship's bow with a dolphin held crosswise in its mouth. The dolphin was either released by this whale (which was accompanied by two juvenile whales) or was able to free itself, and it was next observed swimming at high speed just below the surface with all three killer whales in rapid pursuit. Blood and a small oil sheen were seen on the water. As a dolphin (believed to be the same one that had been seen in the jaws of the killer whale) swam to the starboard side of the ship, a considerable amount of blood was seen flowing from a large wound located on the dolphin's right side just posterior to its dorsal fin. The dolphin dove underneath the stern of the ship followed by the adult killer whale (believed to be the same whale as described above, *i.e.*, AA2). The dolphin was most likely killed underwater near our port quarter within 10 meters of the ship. A large oil sheen was noted in the vicinity where two more whales joined the original group of three. The chase and kill of the dolphin lasted less than 5 minutes.

At the same time, from a vantage point high in the ship's crow's nest, we saw another killer whale (approximately 1 km away), possibly an adult female

or juvenile male, swimming rapidly on the surface and breaching. We suspect this, too, may have been related to dolphin predation since the whale behavior was similar to that described for the predation event we witnessed at close range. Despite our attempts to find the adult male killer whales that had been seen with the group prior to the event, they could not be located. The temporary absence of adult male killer whales during the initial stages of predation on marine mammals has also been observed in the waters of British Columbia (Robin Baird, Marine Mammal Research Group, Victoria, B.C., Canada, personal communication, March 1993). In addition to our observation in May 1992, two other accounts of killer whales preying on Pacific white-sided dolphins in southeastern Alaska have been documented. In March 1992 a pilot (Steve Shrum) witnessed killer whales preying on Pacific white-sided dolphins off Ship Island in Clarence Strait (Ketchikan Daily News, 16 March 1992). On 11 April 1993 a pod of killer whales was seen chasing and then preying on 6–8 Pacific white-sided dolphins near Petersburg, Alaska (Kim Hastings, KFSK Radio, Petersburg, AK, personal communication, 13 April 1993).

In summary, the large concentrations of Pacific white-sided dolphins documented during the months of April and May (1991 through 1993) in the inland waters of southeastern Alaska are uncommon. Their presence in the area could be associated with warm water years or availability of prey species.

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