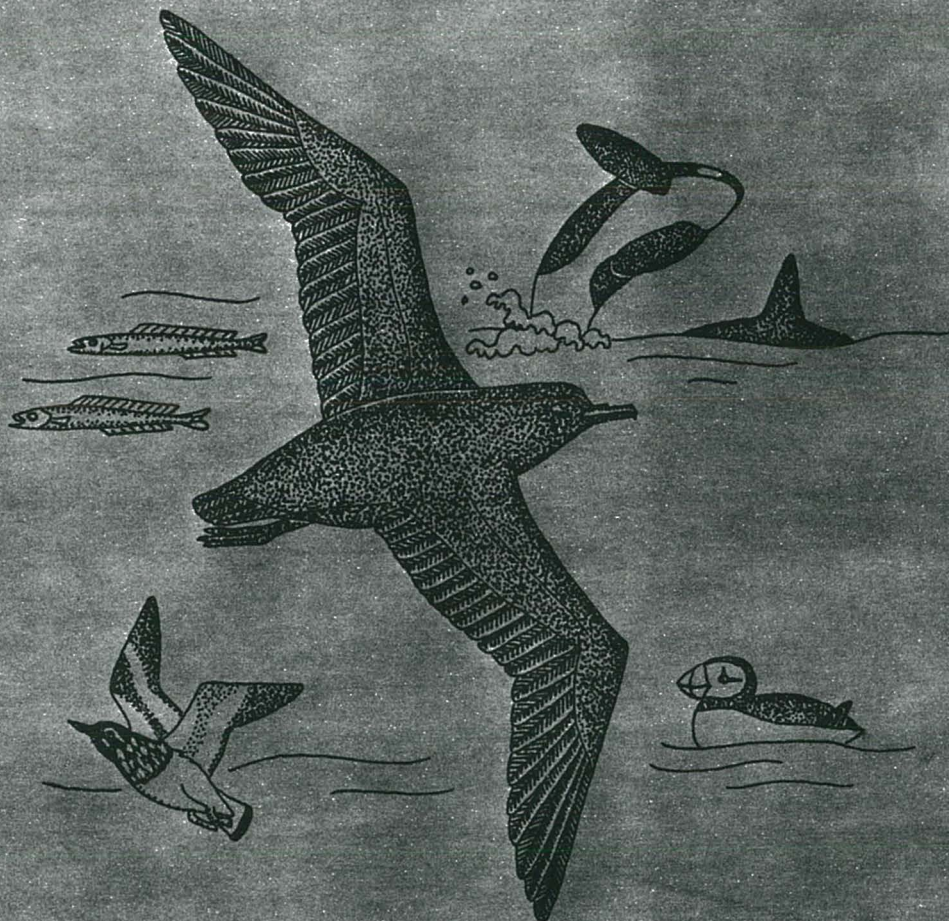


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Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska



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DISTRIBUTION AND ABUNDANCE OF MARINE BIRDS AND MAMMALS
WINTERING IN THE KODIAK AREA OF ALASKA

by

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SUMMARY

Forty-four species of seabirds were observed during the winter of 1979-1980 in the Kodiak Archipelago. Data were also obtained for 6 species of puddle ducks, 5 species of shorebirds, 3 species of raptors, and 10 species of marine mammals.

The species composition of seabirds in the area shifted considerably between summer and winter. Density indices derived for bays in November and February of about 84 and 144 birds per square kilometer (B/km^2) respectively, were well above the 50-60 B/km^2 obtained by the same methods, but over a more limited area, during the summer of 1977. The numerical dominance of Tufted Puffins and Black-legged Kittiwakes in summer shifted to numerical dominance of Common Murres, Scoters, and Oldsquaws in winter. Seabirds over the continental shelf, on the other hand, showed a decrease in abundance with the overall density index dropping from 63 B/km^2 in June 1977 to 23 B/km^2 in February 1980. Density indices for shelfbreak and oceanic habitats showed a small increase from about 4 B/km^2 in June 1977 to 7-8 B/km^2 in February 1980. Species composition over deep waters also changed. Sooty and Short-tailed Shearwaters departed for their breeding areas in the southern hemisphere, and murres increased in numbers over the continental shelf. November was a transition period; small numbers of breeding visitors such as kittiwakes were still present and many winter visitors such as eiders had not yet arrived.

Prime habitats for seabirds wintering in the Kodiak area include ice-free estuaries and lagoons for puddle ducks; marine waters less than 25 m deep with rock or boulder substrates for seaducks; and waters near the 100 m isobath in mid-bay areas for murres. The largest concentration of seabirds, both in November and February, was at the Whale Pass-Afognak Strait area near Whale Island. Other areas of special importance were estuarine and lagoon areas at Alitak and Uyak Bays for puddle ducks; Sitkalidak Strait and Uyak Bay for alcids; the Geese-Aiaktalik Islands Channel, Akhiok Reef in Alitak Bay, nearshore waters in Chiniak Bay, and the continental shelf around the Trinity Islands for sea ducks; and Uyak Strait and mid-Sitkalidak Strait for seabirds in general.

PREFACE

The search for oil and gas has accelerated research related to environmental assessment of the outer continental shelf and adjacent marine habitats in Alaska. Information on biological communities in winter are especially lacking in this area. This report describes an investigation of the distribution and abundance of marine birds wintering in the Kodiak Archipelago of Alaska.

All tables and figures have been assembled at the end of the report for ease in referencing. Tables 1-3 document overall survey efforts. Tables 4-7 are from large plane surveys, tables 8-10 are from small plane surveys, and tables 11-17 are from shipboard surveys.

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BUFFLEHEADS (*Bucephala albeola*) were common in backbays throughout the Archipelago. We found them most abundant in Sitkalidak Strait (Tables 9, 15-16). A change in density was not detected between November and February (Table 17), thereby indicating that the wintering population had arrived by the time of our first survey. A total of 3,151 was counted on our coastal surveys, and another 265 unidentified *Bucephala* made 3,416 birds recorded on the survey. We believe that 4,500-5,000 Bufflehead winter in Kodiak.

OLDSQUAWS (*Clangula hyemalis*) were encountered throughout bay and nearshore habitat (Figures 10-16). Flocks of 200-1,600 were found off rocky headlands, the largest flocks being in outer Natalia Bay, Whale Pass, and the northeast arm of Uganik Bay. Density and frequency indices for this species increased from November to February (Table 17), thereby indicating that birds are still moving into the area in November. Oldsquaws are difficult to census because of their clumped distribution and their tendency to dive for prolonged periods at the approach of an airplane or ship. Coastal surveys miss all of the birds in the middle of bays and our shipboard surveys probably overestimated their numbers by moving through the middle of the largest flocks. We agree with Dick (1977) that this species is the most abundant waterfowl in bays of Kodiak Island. Our best estimate is that about 65,000 Oldsquaws winter in Kodiak bay and nearshore areas, and that many additional birds occur over the nearby continental shelf.

HARLEQUIN DUCKS (*Histrionicus histrionicus*) were inconspicuous inhabitants of rocky coastal habitats. Many are permanent residents. They nest in freshwater habitats and move into the bays in late summer. From shipboard data (Table 17) we calculate a Kodiak population of about 9,600 birds. Coastal surveys accounted for only 4,931 Harlequins. Although most of the population should have been within the 200 m counting zone, we assume many were missed because they are dark, appear in small groups, and often dive rather than fly at the approach of the plane. The largest concentrations of this species were found in the Sitkalidak Narrows-Midway Bay area and between Ugak Island and Narrow Cape.

STELLER'S EIDERS (*Polysticta stelleri*) were the most widely distributed of all eiders and were found in small numbers in most bays (Table 9). This was the only species of eider identified in our November survey and their abundance increased between then and February (Table 17). The occurrence of Steller's Eiders in both coastal and mid-bay areas makes it difficult to estimate the size of their overall population. Three hundred and twenty were counted on coastal surveys and the shipboard density index for February equates to about 1,000 birds. Our best guess is that 1,000-1,200 wintered in Kodiak in 1980 with perhaps the greatest numbers in Chiniak Bay. Dick (1977) believed that this was the second most abundant waterfowl in Chiniak Bay and estimated a population of 1,500-2,000 in the winter of 1976-77. Populations probably vary between years and may be dependent on weather patterns in other wintering areas.

Bay, Uganik Bay, and Kiliuda Bay (Figures 10, 12, 14). Nearly 700 birds remained near the Boulder Bay colony until at least 2 December. Density indices in November and February (Table 17) were much lower than the 9.6-12.4 B/km² found in the summer of 1977 (Gould et al. 1978). Most kittiwakes observed in February, 149 of 248 birds, were associated with the Cape Chiniak colony. By 1 March, 900 birds were found on the Cape Chiniak Colony itself or over nearby waters. This represents an exceptionally early return of birds to a breeding colony in the area. Dick (1977) first saw birds at the Gibson Cove Colony on 1 April.

In February, kittiwakes were most abundant over the shelfbreak. The density index for that area was 2.05 B/km² (Table 5), a value higher than similarly obtained indices of 1.2-1.3 B/km² for the summer of 1977 (Gould et al. 1978). Flocks over these deeper waters did not usually exceed 10 birds, although a few flocks as large as 60 birds were seen outside of the census zone. We estimate that about 65,000 kittiwakes occur over the Kodiak Shelf in winter, 75% of which are over waters deeper than 200 m.

BONAPARTE'S GULLS (*Larus philadelphia*) are uncommon migrants in the Kodiak area. We found three immature birds in a feeding flock of kittiwakes in inner Uyak Bay on 10 November.

ALCIDS

Eleven species of alcids were observed in our surveys of the Kodiak Archipelago. Common Murres were numerically dominant in all areas with Crested Auklets a poor second in bays. Alcids accounted for 43% and 60% of the birds observed on shipboard surveys in November and February respectively, and for 56% of the birds found on aerial surveys over offshore waters.

COMMON and THICK-BILLED MURRES (*Uria aalge* and *U. lomvia*) were found in a ratio of about 30:1 in bays. In November, most Common Murres were in winter plumage while the Thick-bills were just beginning postnuptial molt. Many immature murres were observed in November with most being about two-thirds the size of adults. Especially large numbers of young birds were found in the inner Uyak Bay. The Kodiak Archipelago appears to be a major nursery and wintering grounds for murres in the Gulf of Alaska.

Common Murres were the most abundant and ubiquitous species found in the Kodiak Archipelago. Density indices in bays increased dramatically from a summer mean of about 2 B/km² in 1977 (Gould et al. 1978) to 22 B/km² in November 1979 and 70 B/km² in February 1980 (Table 17). Murres were abundant wherever we went, being found on over 80% of all bay transects and over 50% of all offshore transects (Tables 5, 13-14). Large flocks were found in most bays (Figures 10-16) with the notable exceptions of Alitak and Chiniak Bays.

An exceptional aggregation of 125,000-130,000 murres was found in the Sitkalidak Strait area. Irving Warner (personal communication) estimated that hundreds of thousands and possibly over 1 million murres moved into the strait during a severe storm in January, and Jeff Allen (personal communication) found them extremely abundant there from early January through February. The major concentration of individuals remained along the 100 m isobath (Figure 15) although many of these birds moved into and out of local areas on a daily basis.

Over the continental shelf, murres generally occurred in flocks of less than 5, but groups of 10-20 were not uncommon. Two sizeable concentrations were encountered (Figures 17-18); the first was about 100 km east of Cape Chiniak over the shelfbreak and numbered about 165 birds. The largest was just south of Ugak Island and numbered over 1,300 birds. Many of these birds were rafting in remarkably straight lines paralleling the shore, perhaps foraging along lines of converging currents. Thousands of small fish were observed shoaling at the surface in these areas, probably providing an abundant food source.

There appeared to be movement out of bays in the evening and into bays in the morning, but our observations were inconclusive because bad weather hampered our observations. An early morning collection of five Common Murres had empty stomachs, whereas a 10 A.M. collection of six birds contained freshly caught Capelin in all of the stomachs. Irving Warner (personal communication) reported very large incidental catches of Capelin during January shrimp surveys in eastern Sitkalidak. These fish are apparently a major component in the diet of murres wintering around Kodiak.

Jeff Allen (personal communication), a local crab fisherman, reported catching an average of four murres per day while fishing 90 crab pots at a depth of 110-130 m in Sitkalidak Strait. These are the deepest murre diving depths we know of and they permit a great deal of speculation on the feeding habits and distributions of this species. The maximum depth of Sitkalidak Strait is about 136 m and murres were distributed throughout the area. In Uyak Bay however, mid-bay and outer-bay waters are up to 225 m deep and the murres formed a horseshoe type distribution around the edge, avoiding the deepest waters.

Density indices from ship and aerial surveys in February indicate that more than one million murres may winter throughout the Kodiak region. If these are mostly Common Murres, as indicated in our surveys, the area may support a significant part of the population that nests in the Bering Sea and the Gulf of Alaska.

PIGEON GUILLEMOTS (*Cephus columba*) were the most neritic of the alcids inhabiting the Kodiak Archipelago. They were spread rather thinly along the entire coastline. Areas of highest density were Sitkalidak Narrows, Ugak Strait, Whale Pass, and parts of Uyak Bay. Density indices from shipboard surveys (Table 17) indicate a probable maximum of 6,000-8,000 guillemots in the area.

MARBLED and KITTLITZ'S MURRELETS (*Brachyramphus marmoratus* and *B. brevirostris*) are combined in this report because they are difficult to differentiate in the field. Only Marbled Murrelets were positively identified, but Kittlitz's Murrelets are known to occur in the Kodiak area throughout the year. *Brachyramphus* murrelets were common in all bays but exceptionally large numbers were encountered in Afognak Strait in February (Figure 13). The estimated population size for bays, based on mean density indices (Table 17), would be about 8,000-10,000 for November and 15,000-20,000 for February. It was our impression, however, that high quality habitat in Afognak Strait was overrepresented on our February surveys and we believe that a more reasonable population estimate would be about 13,000.

ANCIENT MURRELETS (*Synthliboramphus antiquus*) were found in equally small numbers in both November and February (Table 17). The few birds seen were in Uyak Bay, Shelikof Strait, and the Marmot-Izhut Bay complex. At least 200-500 birds occur as winter visitors to this area.

A CASSIN'S AUKLET (*Ptychoramphus aleutica*) was seen in outer Sitkalidak Strait on 30 November. This species is undoubtedly much more common than our data indicate and we probably missed the major areas of concentration for the species. Such an area could be the shallow continental shelf around the Trinity Islands.

LEAST AUKLETS (*Aethia pusilla*) are uncommon visitors to the Kodiak Archipelago. A single bird was identified in Outer Uyak Bay on 11 November and at least three other small alcids probably this species were sighted in Uyak Bay in November.

CRESTED AUKLETS (*Aethia cristatella*) are strictly winter visitors to the Kodiak area. As was true with King Eiders, Crested Auklets in the Kodiak Archipelago are at the very eastern limit of their nonbreeding range, and their numbers apparently fluctuate widely from year to year. Eddy Packinenny, a 68-year resident of Larson Bay, told us that he has seen "sea quail" in huge numbers in Whale Pass and Uyak Bay although not in the last 5 or 6 years. We found 10,000-15,000 moving into the Viekoda Bay-Kupreanof Strait-Afognak Strait area on 17 November. We are not sure whether this represented a migratory influx into the region, or merely local movement, but less than 250 were found throughout north and east Kodiak 9 days earlier and the species did not become common in eastern bays until the end of November.

By February birds had left Sitkalidak Strait but were still common on the Shelikof Strait side of Kodiak especially in Viekoda and Spiridon Bays (Tables 13-14). Dick (1977) did not find them in Chiniak Bay until 8 January and his latest observation was 27 February. Total density indices dropped by 8 B/km² from November to February. Crested Auklets probably reached peak numbers in the Kodiak Archipelago in December-January when we estimate possibly 50,000 birds were wintering in the area. The estimated breeding population for the entire gulf is about 42,000 (Sowls et al. 1978) and possibly all of them winter in the Kodiak Archipelago. The Gulf population in November may be augmented in winter by birds from the Aleutian Islands and Bering Sea.