

STUDY TITLE: Migration of Birds in Alaskan Marine Waters Subject to Influence by OCS Development.

REPORT TITLE: Migration of Birds in Alaskan Marine Habitats.

CONTRACT NUMBER(S): BLM: IA5-35; Research Unit No. 340.

SPONSORING OCS REGION: Alaska.

APPLICABLE PLANNING AREA(S): Gulf of Alaska; Kodiak; Cook Inlet; Shumagin; North Aleutian Basin; St. George Basin.

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PROJECT MANAGER(S): Outer Continental Shelf Environmental Assessment Program (OCSEAP).

AFFILIATION: National Oceanic and Atmospheric Administration.

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KEY WORDS: Gulf of Alaska; Kodiak; Cook Inlet; Shumagin; North Aleutian Basin; St. George Basin; Alaska; biology; birds; seabirds; shorebirds; migration; seasonality; oil spills; impacts; shipboard observations; aerial observations; survey; literature review; habitat; alcid; cormorant; puffin; coastal zone; lagoons; maps; data deficiencies; Bristol Bay; Unimak Pass; Cape Peirce; Bering Sea; Alaska Region.

BACKGROUND: Birds are especially sensitive to environmental change because they are near or at the top of the food web. In addition, marine birds are extremely vulnerable to petroleum pollution because many species spend much of their life on the surface of the ocean where they can readily become oiled. The present study was undertaken as a means of describing the migration of marine birds in Alaskan waters. Although the literature on Alaskan birds had recently been reviewed a few years prior to this study, little attention was given to migration of seabirds. This study was conducted as part of the Outer Continental Shelf Environmental Assessment Program, under the direction of the National Oceanic and Atmospheric Administration (NOAA). Funding was provided by the U.S. Department of the Interior, Bureau of Land Management (now the Minerals Management Service) through an interagency agreement with NOAA.

OBJECTIVES: (1) To summarize existing data on magnitudes, patterns, routes, and timing of seabird migrations in Alaskan outer continental shelf (OCS) areas and to relate these to potential oil and gas-related activities.

DESCRIPTION: The emphasis of this study effort was given to: (1) species which were highly vulnerable to oil pollution (e.g., alcids and sea ducks, which spend most of their time on the ocean surface); (2) species located in areas of pending OCS petroleum exploitation; and (3) species that formed large populations during breeding, migration, or wintering. This report was limited primarily to migration of seabirds within the southeast Bering Sea and Bristol Bay, the Aleutian shelf, southern Alaska Peninsula, Kodiak Basin, Lower Cook Inlet, and west and northeast Gulf of Alaska. Data were obtained from a variety of sources, including: (1) bird banding recovery data; (2) shipboard and aerial surveys; (3) site-specific studies; and (4) incidental accounts in published and unpublished literature. Maps showing the seasonal use of coastal and offshore habitats by seabirds were included, as well as tables showing the seasonal occurrence of marine birds in OCS areas.

SIGNIFICANT CONCLUSIONS: Results indicated that the inshore waters of Alaska are heavily used by migrating seabirds. Sea ducks and cormorants use inshore areas throughout the year even though they may migrate. Puffins and relatives, and most cliff-nesters primarily use inshore areas during summer breeding seasons. All of these birds would be highly susceptible to an oil spill while occupying coastal waters. The most important breeding area for marine birds in Alaska was noted as being the Bering Sea, where an estimated 50% of the entire, 23 million Alaskan seabird population is known to breed. Another important area noted was the south side of the Alaska Peninsula. Both these areas would be regions where an oil spill could kill significant numbers of birds. Shorebirds traditionally use certain intertidal areas of the Alaskan coast during migrations. A spill in one of these areas during the migration period could devastate entire populations. Areas where high concentrations of migrating or wintering seabirds were reported included: Unimak Pass (spring and fall); Hagemeister Strait (April); Cape Peirce and Dall Point (spring through fall); Ugashik and Egegik Bays (March); Nelson Lagoon (winter); and Lower Cook Inlet (winter).

STUDY RESULTS: Results of this study indicated that about 30 species, in total representing approximately 23 million breeding marine birds, occur within Alaskan OCS areas. Approximately one-half of these birds are known to migrate to temperate latitudes in winter. The remaining 15 species comprise the major breeding bird populations in Alaska OCS areas, and are relatively sedentary, wintering in the southeast Bering Sea, the Gulf of Alaska, and in the eastern North Pacific. Of the areas studied, the Bering Sea supports the highest abundance of breeding seabirds (i.e., approximately 50% of the 23 million Alaskan marine birds). A smaller number, but greater diversity, are also known to breed along the south side of the Alaska Peninsula. In addition, several species [i.e., 30 million each of short-tailed (*Puffinus tenuirostris*) and sooty (*P. griseus*) shearwaters] of non-breeding migrants summer in Alaskan waters.

The available avifaunal data were inadequate to describe the migrations of most marine birds in Alaska. Nonetheless, migrations of most species [especially eiders (*Somateria* spp.) and scoters (*Melanitta* spp.) which wintered inshore] appeared to occur over and/or along inshore Alaskan waters where they may aggregate in lagoons and off large river mouths. The southeast Bering Sea and southern Bristol Bay were cited as primary wintering areas for scoters and eiders, with the exception of Steller's eider (*Somateria stelleri*) which winter along the southern Alaska Peninsula and near Kodiak Island. Fall migration of sea ducks begins in July for males, and continues through September for females and juveniles. Lagoons serve as molting areas, often being adjacent to wintering areas. Spring migrations from the Alaska Peninsula occur relatively fast, with the birds moving north along the coast, or fast-ice, to Dall Point or Cape Prince of Wales. In this region, some species cross over into Siberia to breed.

Shorebirds use restricted coastal areas (e.g., Cooper-Bering River Delta) in spring. Fall migration is prolonged and involves considerable use of intertidal areas of Bristol Bay and western Alaska. Many of these areas were noted as being traditional for certain species. An oil spill within this region could potentially devastate entire populations.

Reviewers noted that the migrations of most alcids and cliff-nesters were poorly known because the birds dispersed following breeding. In general, these birds would be most vulnerable to oil spills during the summer breeding season when they are concentrated near colonies. However, exceptions were noted, including cormorants (*Phalacrocorax* spp.). These species are year-round residents in coastal waters and thus are always susceptible to an oil spill.

Several of the areas where high concentrations of migrating or wintering seabirds were reported included: Unimak Pass (spring and fall); Hagemeister Strait (April); Cape Pierce and Dall Point (spring through fall); Ugashik and Egegik Bays (March); Nelson Lagoon (winter); and Lower Cook Inlet (winter).

Maps showing seasonal use of coastal and offshore habitats by important bird species were prepared under this study effort. Tables showing the seasonal occurrence of marine birds in OCS areas were also prepared.

Regions where obvious data gaps were present included: (1) portions of western Alaska; (2) eastern Bristol Bay; (3) Aleutian Islands; (4) southern Alaska Peninsula; and (5) all of southeast Alaska, especially Alexander Archipelago. It was suggested that future studies in these area would aid in elucidation of the importance of coastal areas for migrating Alaskan birds. It was noted that many of these regions were probably important staging and molting areas as well.

STUDY PRODUCT(S): Lensink, C. J. and J. C. Bartonek. 1978. Migration of Birds in Alaskan Marine Habitats. A final report by the U.S. Fish and Wildlife Service for the U.S. Department of the Interior, Bureau of Land Management Alaska OCS Office, Anchorage, AK and the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, OCS Environmental Assessment Program, Anchorage, AK. Contract No. AA850-IA5-35; Research Unit No. 340. 44 pp.

The report(s) cited above has/have been included within the report series entitled "Environmental Assessment of the Alaskan Continental Shelf, Final Reports of Principal Investigators," Volume 5, Biological Studies (March 1979), pp. 245-288 (NTIS No. PB82-171794/AS).

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