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Discovery of Northern Fur Seals (*Callorhinus ursinus*) Breeding on Bogoslof Island, Southeastern Bering Sea

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ABSTRACT. A small group of northern fur seals (*Callorhinus ursinus*) including one male with two females, each with a small pup, and two lone males was discovered on Bogoslof Island, Alaska in the Bering Sea on 20 July 1980. This is the first evidence of breeding on Bogoslof, or on any island in the eastern Bering Sea other than the Pribilof Islands. We suggest that these fur seals require breeding islands adjacent to the continental shelf break where they are supported by the pelagic food web characteristic of the oceanic and outer shelf domains.

Key words: fur seal, *Callorhinus ursinus*, Steller sea lion, *Eumetopias jubatus*, Aleutian Islands, Bering Sea

RÉSUMÉ. Le 20 juillet 1980, un petit groupe d'otaries à fourrure (*Callorhinus ursinus*), y compris un mâle et deux femelles, chacune accompagnée d'un jeune otarie, et deux mâles solitaires, ont été découverts sur l'île Bogoslof, en Alaska, dans la mer de Béring. Ce groupe représente la première instance d'accouplement sur l'île Bogoslof ou sur toute autre île dans l'est de la mer de Béring, à part les îles Pribilof. Nous proposons que ces otaries à fourrure nécessitent des îles d'accouplement adjacentes à la faille du plateau continental où ils sont supportés par le réseau alimentaire pélagique caractéristique des domaines océaniques et des plateaux extérieures.

Mots clés: otarie à fourrure, *Callorhinus ursinus*, otarie, *Eumetopias jubatus*, îles Aléoutiennes, mer de Béring

Traduit par Maurice Guibord, Department of Archaeology, University of Calgary.

INTRODUCTION

Our discovery of a group of northern fur seals (*Callorhinus ursinus* Linneaus) apparently breeding on Bogoslof Island in the southeastern Bering Sea, together with reports of new breeding colonies in other areas, indicate that the species is expanding its choice of breeding sites. The northern fur seal is known to breed on only a few isolated islands in the North Pacific Ocean (Fig. 1), with most of the population (75 to 80%) limited to the Pribilof Islands (NMFS, 1979; Harry and Hartley, 1981). Other populations occur in the Komandorski Islands and on Tyuleniy (Robben) Island (Scheffer, 1958). Rookeries recently have become re-established on Lovushek and Srednev in the Kuril Islands, a part of the former range of the fur seal (Voronov, 1974), and another new rookery was discovered recently on San Miguel Island off the coast of California (Peterson *et al.*, 1968). Historical records indicate that fur seals formerly bred on many of the Kuril Islands but were extirpated, apparently by human harvest, in the late 19th century (Voronov, 1974). In addition, Murie (1959) suggests that fur seals once bred, at least intermittently, on Buldir in the western Aleutian Islands, but they have not been seen breeding there in recent years (R.H. Day, pers. obs., 1975, 1977, 1978).

While visiting Bogoslof Island, Alaska (53°56′N, 158°02′W) on 20 July 1980, we discovered a small group of fur seals on a boulder beach on the northwestern side of the island, adjacent to a sandy beach occupied by a rookery of several hundred Steller sea lions (*Eumetopias jubatus* Schreber). The fur seal group consisted of one male with two females, each with a small (estimated 4-5 kg) pup, and two lone bulls. The bull accompanying the cows was extremely defensive and emitted the "whickering" call (Kenyon, 1960) when we approached the cows and pups. Since copulation normally occurs a few days after parturition (Bartholomew and Hoel, 1953) our observations suggest that these animals had bred on Bogoslof. If so, this is the first report of fur seals breeding there since this island rose out of the sea in 1796 (Byrd *et al.*, 1980).

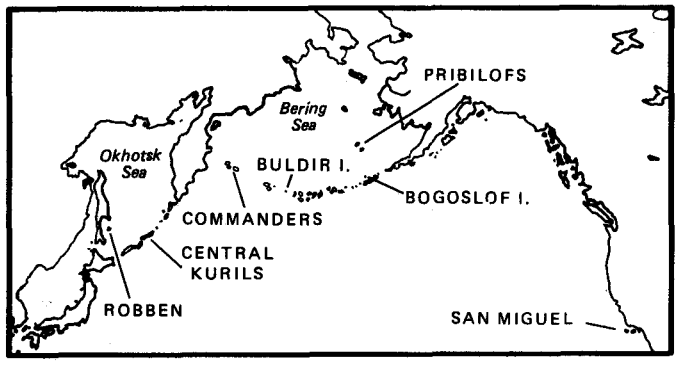

FIG. 1. Location of present and historical rookeries of the northern fur seal (adapted from NMFS, 1979).

There are two previous sightings of northern fur seals on Bogoslof Island, both on the same beach as our finding (C.H. Fiscus, pers. comm. 1980). On 23 October 1976 a National Marine Fisheries Service survey party found a large adult male hauled out near a group of sea lions. A second NMFS survey on 15 July 1979 saw one adult male and one subadult male among the sea lions.

We consider Bogoslof Island a likely site for development of a fur seal rookery since it is adjacent to the major pelagic feeding area also used by fur seals on the Pribilof Islands (Fiscus *et al.*, 1964). This feeding area is part of the oceanic and outer shelf domains of the Bering Sea which have been well delineated by recent oceanographic inves-

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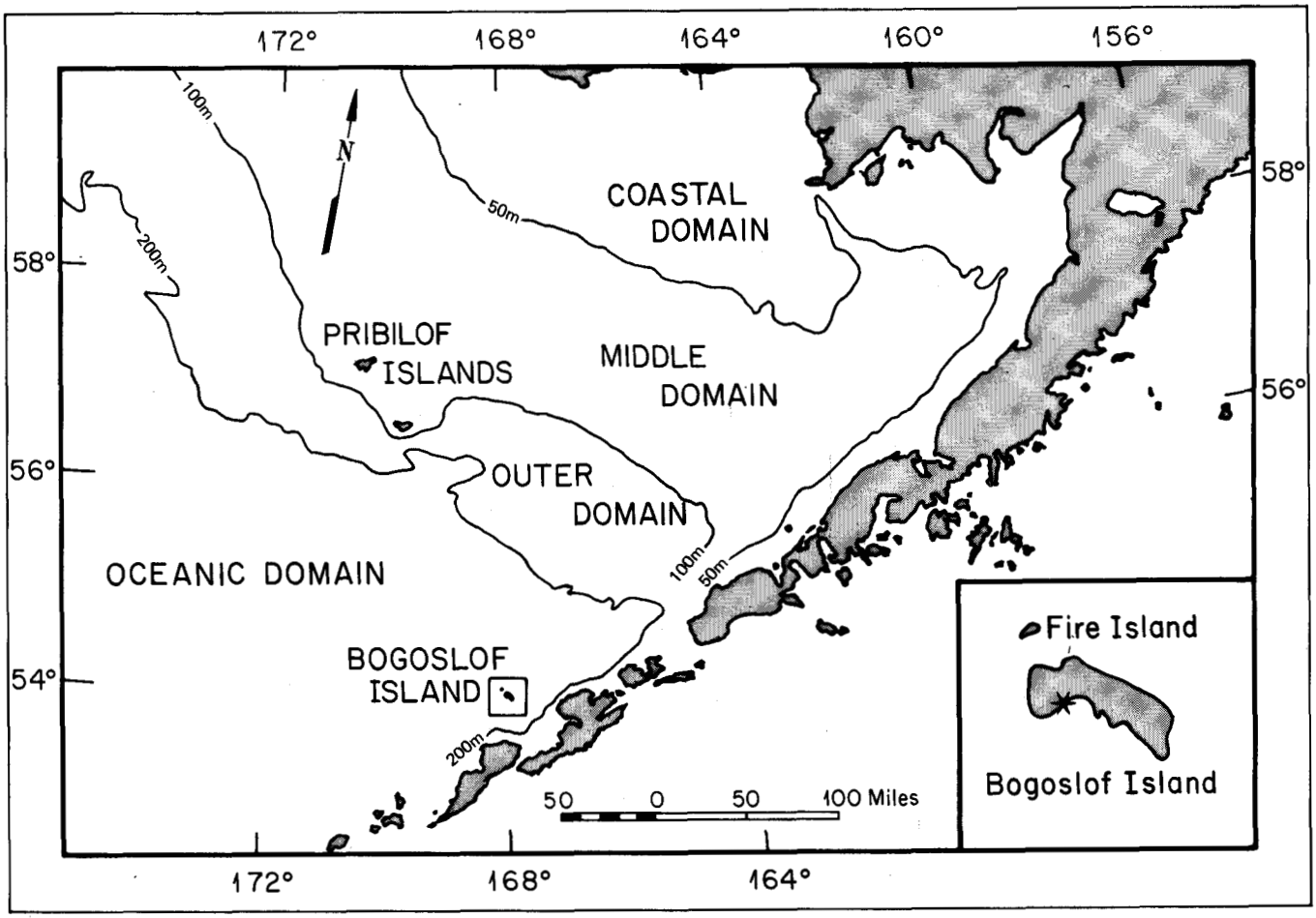

FIG. 2. Oceanographic domains and fur seal rookeries in the southeastern Bering Sea. Star on inset indicates location of breeding fur seals sighted on Bogoslof Island.

tigations (Iverson *et al.*, 1979). In general, the oceanic domain is seaward of the continental shelf break; the outer shelf domain extends from waters over the shelf break shoreward to approximately the 100 meter isobath (Fig. 2). Both the outer and inner boundaries of the outer shelf domain are marked by distinct oceanographic fronts (Kinder and Schumacher, 1981). This region of the Bering Sea, and not that over the shallower portions of the shelf, supports the highly productive pelagic food web on which the fur seals depend. The outer shelf and oceanic domains are the feeding habitats for the northern fur seal in this area (Perez, 1979; Perez and Bigg, 1980), and we suggest that they are for all fur seal rookeries. Although strictly comparable oceanographic data for California and the western North Pacific are not available, all known breeding sites of the northern fur seal are close to the shelf edge where processes occur that nourish a pelagic system similar to that in the southeastern Bering Sea (Walsh, 1981). We propose that only islands in or immediately adjacent to the outer shelf domain are suitable for fur seal rookeries. Nonetheless, these seals apparently require more from breeding sites than simply proximity to appropriate feeding areas. Many other islands, the Aleutians for example, are within the outer shelf and oceanic domains but are not used by these seals as breeding sites.

We suspect that the suitability of breeding islands for fur seals is influenced by the presence of other otariids, specifically sea lions which resemble fur seals in body form and social behaviour. Steller sea lions are present at all of the northern rookeries of the fur seal during the period of reproduction (Belkin, 1966), albeit on the periphery or on beaches nearby the larger rookeries. The newly established fur seal colony on San Miguel Island is amid a rookery of California sea lions (*Zalophus californianus* Lesson) (Peterson *et al.*, 1968), and that on Srednev Island in the Kuril Chain is in the middle of a very large Steller sea lion rookery (Voronov, 1974). Of course we realize that coincidence of occurrence of fur seals with other otariids on their breeding sites does not necessarily imply a biological relationship but it is a fact worthy of continued investigation.

The developing fur seal rockery at San Miguel Island is an extreme example of colonization, since it is situated at the southern limit of the winter range of the northern fur seal (Wilke and Kenyon, 1954). Peterson *et al.* (1968) speculated that the seals were attracted to this island by its

position in the path of the cold California Current and its established rookeries of California sea lions and northern elephant seals (*Mirounga angustirostris* Gill). We can only add the observation that San Miguel lies at the edge of the narrow shelf off California and is one of the northern Channel Islands influenced by seasonal upwelling of cold oceanic water (R. Lasker, pers. comm. 1980). These conditions also constitute an outer shelf-oceanic system.

Colonizations of Lovushek, Srednev, and San Miguel islands appear to be examples of successful attempts of expansion of breeding sites by the northern fur seal; presumably other attempts have been unsuccessful. Although only observed in one year, fur seals breeding on Bogoslof Island may well constitute the latest successful attempt to colonize a new area (certainly additional observations are necessary to confirm this). This expansion may be in response to changing environmental conditions, such as competition with humans for fish resources or the harvest of these seals on the breeding islands. The expansion of a species with a restricted and well known breeding distribution poses several questions about dispersal and behaviour in seal populations as well as about the ecology of the seas and the impact of human activities on the oceans.

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