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SELECTED ANNOTATED REFERENCES ON MARINE MAMMALS OF ALASKA

September 1979

NOTICE

SELECTED ANNOTATED REFERENCES ON MARINE MAMMALS OF ALASKA

by

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OUTER CONTINENTAL SHELF ENVIRONMENTAL ASSESSMENT PROGRAM
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Introduction

Under contract to the Bureau of Land Management (BLM), U.S. Department of the Interior, and administered through the National Oceanic and Atmospheric Administration, U.S. Department of Commerce, the Marine Mammal Division (MMD)* of the Northwest and Alaska Fisheries Center (NWAFC) gathered information on the abundance and distribution of pinnipeds (seals, sea lions, and walruses) and cetaceans (whales, dolphins, and porpoises) in the waters of Alaska. This was part of the BLM and NOAA's Outer Continental Shelf Environmental Assessment Program (OCSEAP). The contracts provided mainly for the performance of field research, but also called for the collection and annotation of relevant literature to assist researchers in formulating and in writing up their field work, and to give managers and administrators an overview of the kind of work which has been done and of the current state of knowledge.

An earlier form of this list came out in January 1977 as a processed report of the NWAFC entitled "An annotated bibliography on marine mammals of Alaska" by Nancy C. Severinghaus and Mary K. Nerini.

This list supplements four OCSEAP research units (RU's). These follow with their formal delimitations: RU 67 -- the eastern Bering Sea from the north edge of the Alaska Peninsula including the Fox Islands (Unimak to Umnak Islands) north to the 66°N latitude line over the continental shelf; RU 68 -- the Gulf of Alaska from 130°W longitude to the west end of Umnak (169°30'W longitude, 53°40'N latitude), and from 52°N latitude to the Alaska coast; RU 69 -- bowhead and beluga whales in the Bering, Chukchi and Beaufort Seas west of the US-USSR 1867 Convention line, and east to the American - Canadian border at 141°W longitude; and RU 14 -- early spring distribution, density and abundance of the Pacific walrus (Odobenus rosmarus) in 1976.

This reference list has not been strictly limited by these geographical borders; that is, many of the references cited here report on data gathered outside the designated area. However, they will concern a species which is represented in that area but about which information is relatively scarce (e.g., the minke whale), or they will concern animals which migrate into the designated area at another season of the year (e.g., elephant seals in California). Presumably some inferences can be made from these reports which bear on the animals found in the Alaskan waters under study.

Some references are included on polar bear and sea otter, though these were not called for. Polar bears in Alaska subsist mainly on ringed seals and bearded seals and thus are relevant to an assessment of the populations of those seals.

The citation style follows the National Marine Fisheries Service Style Manual (U.S. Department of Commerce, NOAA, NMFS, Seattle, Washington; November 1972). References are arranged alphabetically by the author's surname. Multiple authors are alphabetized by first author surname, then by

*(now called the National Marine Mammal Laboratory)

second author surname, and so on. Citations by the same author or authors are arranged chronologically. When no author is shown on an item, the name of the journal is used as the author instead of "anonymous". Names of journals and periodicals are abbreviated using the Word-Abbreviation List, American National Standards Institute, Standards Committee Z39, published by the National Clearinghouse for Periodical Title Word Abbreviations.

A number of articles translated from the Russian are cited here. The original Russian titles of these articles appear with Cyrillic characters transliterated into Roman ones. (Transliterations by this author conform to the guide given by Standards Committee Z39 of the American National Standards Institute; those done by translators may differ slightly.) In only one or two cases the original Russian title could not be obtained. Titles of Soviet periodicals are abbreviated in transliterated form according to the Word-Abbreviation List (mentioned above) and/or the Russian title word abbreviation list prepared by Mr. Paul Macy, NWAFC. Information on the translation is given in parentheses. Most but not all of these Russian language citations were reviewed by Mr. Macy before his retirement.

The contents of the index are listed at the beginning of the index section (on yellow paper). Following this is a key to index codes, which also serves as a species list.

The index consists of three sections: species index, area index, and subject index. Species in the species index are arranged alphabetically by scientific name within these categories: pinnipeds, other carnivores, sirenians, and cetaceans. In the species index each entry is followed by letter codes indicating whether that source contains information on abundance, distribution, feeding, Beaufort Sea, Chukchi Sea, Bering Sea, Aleutian Ridge, Gulf of Alaska, or a combination of these. In the area index and the subject index, entries are followed by letter codes indicating the species(') dealt with. Under all index headings, entries are arranged in chronological order. The intention here was to give a rough picture of the accumulation of knowledge over time. It may be that the bias in inclusion of articles (favoring those more easily available) and the small total number of these make this arrangement less than instructive. Feedback from users on this matter and on usefulness of index codes will be appreciated.

Bibliographic sources consulted are listed at the end of this report. By far the most important of these is the National Marine Mammal Laboratory itself, with its collection of volumes, reprints, and unpublished material.

Thanks go to Roger Pearson for guidance on citation style, to Paul Macy for special help with Russian language items, to Howard Braham for his patience with the numerous unavoidable delays which have beset this project, to Dale Rice for a critical reading-over of the annotations, to Teresa Bray for proofreadings and for a myriad of smaller things, and of course to Mary Nerini who contributed many annotations and welcome energy to the first "edition" of this list.

Selected Annotated References
on Marine Mammals of Alaska

Addison, R.F., and P.F. Brodie.
1973. Occurrence of DDT residues in beluga whales (Delphinapterus leucas) from the Mackenzie Delta, N.W.T. J. Fish. Res. Board Can. 30(11):1733-1736.

About 1,500-2,000 beluga whales are found in the Mackenzie delta estuary through July and into August. Authors report no evidence of feeding in July 1972 and all sampled stomachs were completely empty. Tissues from 14 whales of the native catch of July 1972 were examined. DDT and DDE content of liver, muscle, and blubber is given. The migratory movements of this population of whales are thought to be confined to the Beaufort and Chukchi Seas. Possible sources of contaminants are discussed. 1 tab., 16 ref.

Alexander, A.B.
1953. Manuscript report by A.B. Alexander concerning fur seals, 1892. Records of the U.S. Fish Commission. Gen. Serv. Admin., Natl. Archives, Washington, D.C. 23 p.

Description of pelagic fur sealing, which began along the northwest coast of North America perhaps as early as 1879, and in the Bering Sea in the early 1880's. Includes descriptions of vessels and equipment used, Neah Bay Indians as fur seal hunters, feeding habits and other behavior of fur seals, sealing on Japan coast, and killer whales.

Allen, K. Radway.
1974. Current status and effect of a moratorium on the major whale stocks. Rep. Int. Comm. Whaling 24:72-75.

Projects the possible effects on 6 whale species of a complete and protracted moratorium on killing. Table gives species, stock, present condition, expected effect, and source of data for right, blue, humpback, gray, sperm, and fin whales. Brief text explains use of terms in table and methods of estimation used.

American Society of Mammalogists - Standing Committee, Marine Mammals.
1976. Report submitted to 56th Annual Meeting of the American Society of Mammalogists at Lubbock, Texas, June, 1976. Edmonton, Alberta, 26 May 1976. 30 p.

Chairman Ian Stirling and nine committee members present status reports on various species of marine mammals, and on research activities. Committee members are Michael A. Bigg, John J. Burns, Clifford H. Fiscus, Roger L. Gentry, Ancel M. Johnson, William F. Perrin, Dale W. Rice, Aryan I. Roest, David E. Sergeant, and Thomas G. Smith. Bigg, Sergeant and Smith are from Canada; others are from U.S.

1977. Report submitted to the 57th Annual Meeting of the American Society of Mammalogists at E. Lansing, Mich., June, 1977. Edmonton, Alberta, 1 June 1977. 32 p.

In addition to individual reports on various marine mammals, a brief statement on sea otters is included, summarizing the "sea otter problem" in California, and possible solutions.

Anas, R.E.
1974. Heavy metals in the northern fur seal, Callorhinus ursinus, and harbor seal, Phoca vitulina richardi. Fish. Bull., U.S. 72(1):133-137.

Fur seals studied came from the Pribilof Islands and from waters off the state of Washington. Harbor seals came from coastal waters of California and from other points northward to the Bering Sea. All fur seal samples had mercury, lead and cadmium, but no arsenic. Mercury appears to be accumulated in fur seal livers. In harbor seals, only mercury was investigated, and levels found were similar to levels found in fur seals. (Maximum concentrations were 700ppm in a harbor seal from San Miguel Isl., and 170ppm from a fur seal.)

Andrews, R.C.
1909. Observations on the habits of the finback and humpback whales of the eastern North Pacific. Bull. Am. Mus. Nat. Hist. 26:213-226.

Data were gathered during the spring and summer of 1908 on vessels and at whaling stations; animals were from waters off the west side of Vancouver Island and off the southern end of Admiralty Island, Alaska. Includes description of respiration, inspiration. diving movements, duration of dives, feeding habits and stomach contents. 30 fig. (photos)

Anthony, A.W.
1924. Notes on the present status of the northern elephant seal, Mirounga angustirostris. J. Mammal. 5(3):145-152.

Notes from a voyage to Guadalupe Island in July of 1922 and 1923. Estimation of the herd size was 1,250. No evidence of recent hauling grounds was found to the south of Guadalupe. 8 photos.

Arsen'ev, V.A.

1941. Pitanie polosatogo tyulenya (Histriophoca fasciata Zimm.) [Feeding of the ribbon seal]. Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 20·121-127. (Transl. by John J. Burns, Alaska Dep. Fish Game, 1977, 8 p.)

Stomachs of 398 ribbon seals were examined by author and G. Pikharev. Seals were caught in the ice of the southwestern Okhotsk Sea in spring 1939. About 83% of the stomachs were empty; 54 out of the 68 containing food were sampled. Listed in descending order of occurrence, the following animals were found: pollock, cephalopods, cod, pandalid shrimp, lumpsuckers (Aptocyclus), capelin, and crangonid shrimp. Majority of seals with food in stomachs were taken in 100-200m of water or more. Amount of food taken at one time is inferred from condition of stomach contents. Relation of feeding to molt is discussed. Previous stomach dissections are reviewed. 2 tab.

1969. Mezhdunarodnye koordinirovannye issledovania po morskim kotikan (International coordinated research on fur seals). P. 24-33 in V.A. Arsen'ev, B.A. Zenkovich, and K.K. Chapskii (eds.), Morskie mlekopitayushchie (Marine mammals) [a collection of articles containing materials from the 3rd All-Union Conf. on Mar. Mammals], Akad. Nauk SSSR, Min. Rybn. Khoz. SSSR, Ikhtiol. Kom.. Izd. "Nauka", Moscow. In Russian. (Transl. by Fish. Res. Board Can., 1970, Transl. Ser. 1510. Summary only.)

Describes organization of the International Commission on fur seals, and its recommendations for maintaining maximum sustainable yields. Describes the goals of the [Interim] Convention [on Conservation of North Pacific Fur Seals], and briefly gives the basic results of the first six years of coordinated research.

1971a. O lokal'nom raspredelenii morskikh kotikov Yaponskom More (The local distribution of fur seals in the Sea of Japan). Atl. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (AtlantNIRO) 39:138-150. In Russian. (Transl. Fish. Mar. Serv., Can., 1974, p. 226-239 in K.K. Chapskii and E.S. Mil'chenko (eds.), Research on Marine Mammals, Transl. Ser. 3185.)

Preliminary analysis of data collected in pelagic research in 1958-61 and 1964-66, by the USSR, the USA, Canada and Japan, indicates that in the Sea of Japan fur seals form mixed aggregations including animals of both sexes and almost all age groups. 4 tab., 7 fig.

1971b. Vozrastno-polovoi sostav morskikh kotikov, zimuyushchikh v zapadnoi chasti Tikhogo okeana (The age and sex composition of marine fur seals wintering in the western Pacific Ocean). In Morskie mlekopitayushchie (kotiki i tyuleni) [Marine mammals (fur seals and seals)]. Tr. Vses. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (VNIRO) 80 (Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 82):25-43. In Russian. (Transl. by Fish. Res. Board Can., 1973, Transl. Ser. 2567, 21 p.)

Research has been conducted in waters off Japan in hopes of discovering separate accumulations of fur seals by age and sex, so that it might be possible to harvest males at sea. Such accumulations were not found, although at the end of wintering young males sometimes predominated over females in the kill. 13 maps with tables.

1972. (On maximum sustainable yield of fur seals on the Commander Islands). Vses. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (VNIRO) (Transl. avail. from Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115, 8 p.)

Data are insufficient for determination of the maximum sustainable yield from the Commander Islands. Bulls began decreasing in 1966 and continue to do so. Advent of bachelors has been weak in all North Pacific rookeries; thus kills have decreased.

Arsen'ev, V.A., V.A. Zemskii, and I.S. Studenetskaya.

1973. Rod serye kity Eschrichtius Gray, 1864 (Gray whales genus Eschrichtius Gray, 1864). P. 30-35 in Morskie mlekopitayushchie, Izd. "Pishch. Prom.", Moscow. In Russian. (Transl. by Israel Progr. Sci. Transl., avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 744-50059.)

At present found only in the North Pacific, until the beginning of the 18th century gray whales were also found in the Atlantic. The article briefly covers food items, behavior, reproduction and growth. Migratory patterns are noted in a general fashion.

Bailey, Alfred M.

1928. An unusual migration of the spotted and ribbon seals. J. Mammal. 9(3):250-251.

Following sudden freeze-ups of lagoons in the vicinity of Cape Prince of Wales, both spotted and ribbon seals are reported to have travelled over high country, covering a few miles a day, to reach open water to the south.

Bailey Alfred M., and Russell W. Hendee.

1926. Notes on the mammals of northwestern Alaska. J. Mammal. 7(1):9-28.

An expedition of 16 months in 1921-22 is recounted. Authors were landed at Wainwright, their winter base. on 6 August 1921 by Coast Guard cutter, having visited King and St. Lawrence Islands, and points on the Siberian coast. Bailey visited Barrow and Demarcation Pt. with the cutter ("Bear"). Point Hope. Kivalina, Kotzebue, and Wales were visited by dog-sled. Observations are included on: polar bear, "Pribilof harbor seal" or spotted seal, ribbon seal, bearded seal walrus, bowhead whale (bowhead hunting at Wainwright is described at length), "inito" [=ingutuk] (arctic whale similar to bowhead but smaller and differing in other ways, which are described), gray whale, beluga whale, killer whale, and harbor porpoise (seen at Unalaska).

Baker, Ralph C., Ford Wilke, and C. Howard Baltzo.
1970. The northern fur seal. U.S. Fish Wildl. Serv., Circ. 336, 20 p.

Author's abstract: "The early history of worldwide fur sealing; the distribution and movement of northern fur seals; and their food, physical characteristics, reproduction, and mortality and disease are discussed. Information is also given on fur seal population, management, and research; sealing on the Pribilof Islands; and processing and sale of fur seal skins." 1 drawing, 13 photos.

Balcomb, K.C.
1973. Cuvier's beaked whale from Washington state. Murrelet 54(3):37.

A skull of Ziphius cavirostris was found on Ruby Beach, Washington, in February 1972. This was the first record from Washington state.

Baldridge, A.
1972. Killer whales attack and eat a gray whale. J. Mammal. 53(4):898-900.

In May of 1967, a pod of 5-6 killer whales killed a gray whale calf off the California coast. The whales consumed the tongue, jaw and ventral blubber of the animal. It is suggested the killer whales held the gray calf under water, eventually causing its demise by drowning.

Barabash-Nikiforov, I.
1935. The sea otters of the Commander Islands. J. Mammal. 16(4):255-261.

Reports on observations of 600-700 sea otters mostly on Copper Island, from 1930 to 1932. Covers external characters, habits, competitors, enemies and parasites. Size and weight are tabulated by age, from embryo to over 8 years. Eumetopias, Callorhinus, and Phoca ochotensis macrodens [= P. vitulina and/or P. largha] also inhabit Copper Island.

1938. Mammals of the Commander Islands and the surrounding sea. J. Mammal. 19(4):423-429.

Briefly describes geography, climate, flora and fauna of the islands, and describes 18 species of marine mammals: otter, 7 pinnipeds, five great whales, 3 beaked whales, killer whale and 3 other dolphins. Notes seasonality of most species.

Barr, Lou.
1975. Steller sea lion. Oceans 8(4) 18-21.

Author notes population totalling 240,000-300,000 worldwide, with half of that in Alaskan waters; habit of hauling out on rocks, often high above the water· opportunistic feeding; curiosity about scuba divers; graceful, controlled swimming; and occasional roaring under water. Author describes underwater encounters at Auke Bay (near Juneau, Alaska) and off Point Ivakin (Amchitka Island, Aleutian Islands). 4 photos.

Barr, N. and L. Barr.
1972. An observation of killer whale predation on a Dall porpoise. Can. Field-Nat. 86(2):170-171.

Describes 2 killer whales pushing a Dall porpoise October, 1971, near Auke Bay, Alaska. Shortly thereafter, the whales disappeared, and presumably killed their prey.

Bartholomew, G.A., Jr.
1952. Reproductive and social behavior of the northern elephant seal. Univ. Calif. Publ. Zool. 47(15):369-472.

Observations were made from April 1949 to May 1950 on San Nicolas, Los Coronados, Guadalupe, and San Benito Islands. Good descriptions of social behavior and locomotion. Elephant seals are extremely gregarious and prefer to be tightly packed. Fighting usually occurs between individuals of the same size but the skin is not broken. Breeding behavior is described in detail. Breeding occurs from December to March. These seals are polygamous and the dominant males have harems with perhaps 13 females. Only one young is born to a female per year.

Bartholomew, G.A., and C.L. Hubbs.
1960. Population growth and seasonal movements of the northern elephant seal, Mirounga angustirostris. Mammalia 24(3):313-324.

Population has increased from 50 in 1892, to 13,000 in 1957. Article traces the history of the population changes. Census figures (for Guadalupe and other islands) show a ten-fold seasonal fluctuation. Adult males apparently range out to sea as far north as Oregon and Washington. 1 tab., 2 fig., 4 pl., 20 ref.

Bee. James W. and E. Raymond Hall.
1956. Mammals of northern Alaska on the arctic slope. Univ. Kans. Mus. Nat. Hist., Misc. Pub. 8, 309 p.

Description and discussion of 42 species, including white whale, narwhal, killer whale, harbor porpoise, gray whale, bowhead whale, polar bear, fur seal, walrus, and harbor, ribbon, ringed and bearded seals. New records of occurrence and those previously published are listed and mapped. 4 pl., 127 fig., 5 tab.

Beier, John C., and Douglas Wartzok.
1977. Mating behavior of captive spotted seals (Phoca largha). Abstr. only, in Proc. (abstracts), Second Conf. Biol. Mar. Mammals, San Diego, California, 12-15 December 1977, p. 26. (Avail. from first author, The Johns Hopkins Univ., 615 N. Wolfe St., Baltimore, MD 21205.)

Underwater mating behavior of a pair of seals was observed during April and May, 1973-1977. Seven types of behavioral interactions and six types of vocalizations (all drawn from repertoire observed throughout year) increased significantly during mating season.

Benson, S.B. and T.C. Groody.
1942. Notes on the dall porpoise (Phocoenoides dalli). J. Mammal 23:41-51.

From a specimen captured in San Francisco Bay. morphological notes were taken on the Dall porpoise.

Berg, Ronald J.

1977. An updated assessment of biological resources and their commercial importance in the St. George Basin of the eastern Bering Sea. In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 555-680. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder, Colo.

The commercial fisheries, major fisheries, major shellfishes, and marine mammals (only those under jurisdiction of the National Marine Fisheries Service) of the St. George Basin are discussed. The National Marine Fisheries Service recommends the establishment of a marine sanctuary to include this very productive and important area. 13 tab., 32 fig., 174 ref.

Berzin, A.A.

1959. O pitanii kashalota v Beringovom More (On the feeding of sperm whales (Physeter catodon) in the Bering Sea). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 47:161-165. In Russian. (Transl. by School Fish., Univ. Washington. Seattle, 1970, 9 p.)

Reports on examination of stomachs of 110 whales taken from waters of the Aleutian ridge and the northwestern Bering Sea. About 64% of stomachs contained squid only. Stomach contents and degree of filling were analyzed by area. Nine species of squid, and fish representing 8 families were found. In the northern area only, fish predominated over squid, but less food was taken. Concludes that the Commander Islands area is the major feeding area for sperm whales in the Bering Sea. 2 tab.

1964a. Opredelenie vozrastnogo sostava stada kashalotov Beringova morya i prilezhashchikh chastei Tikhogo okeana (Determination of age composition of the sperm whale stock of the Bering Sea and adjacent parts of the Pacific) Tr. Vses. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (VNIRO) 53 (Izv. Tikhookean. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (TINRO) 52):267-270. In Russian. (Transl. by Israel Progr. Sci. Transl., 1968, p. 263-266 in P.A. Moiseev (ed.), Soviet fisheries investigations in the northeast Pacific, Pt. 3, avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 67-51205.)

Pacific sperm whales are composed of two independent stocks: Asiatic and American. American stock said to migrate from California to Aleutian Islands and into Bering Sea. Catch information in 1950-61 indicated that American stock was becoming younger on the whole because intensive whaling since 1954 had removed older animals. 1 fig.

1964b. Rost kashalotov severnoi chasti tikhogo okeana (Growth of sperm whales in the North Pacific). Tr. Vses. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (VNIRO) 53 (Izv. Tikhookean. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (TINRO) 52):271-275. In Russian. (Transl. by Israel Progr. Sci. Transl., 1968, p. 267-271, in P.A. Moiseev (ed.), Soviet fisheries investigations in the northeast Pacific, Pt. 3, avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 67-51205.)

Age of 605 sperm whales was determined by dentin lamination in 1959-1960. Newborn whales are 400-430cm long. They grow 170-200cm the first year and 1m a year for the next 7 years. Females reach physical maturity at 15-17 year (11m). Males reach physical maturity at 23-25 years (15.9m). Life span was determined to be 35 for females and 45 for males.

1971. Kashalot (The sperm whale). Izd. "Pishch. Prom.", Moscow. 367 p. In Russian. (Transl. by Israel Progr. Sci. Transl., 1972, 394 p., avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 71-50160.)

A compilation of knowledge about the sperm whale. Includes discussion on taxonomy, detailed morphology, distribution, migration, behavior, biology and whaling.

Berzin, A.A., and A.A. Kuz'min.

1975. Serye i gladkie kity okhotskogo moria (Gray and right whales of the Okhotsk Sea). P. 30-32 in G.B. Agarkov and I.V. Smelova (eds.), Morskie mlekopitayushchie (Marine mammals), Part 1, (Materials 6th All-Union Conf. [on Studies on Marine Mammals]), Kiev, 1-3 Oct. 1975. Min. Rybn. Khoz. SSSR, Ikhtiol. Kom., VNIRO, Akad. Nauk SSSR, Inst. Evol. Morfol. Ekol. Zhivotn., Inst. Biol. Razvit., Zool. Inst., Akad. Nauk USSR, Inst. Zool. Izd. "Naukova Dumka", Kiev. In Russian. (Transl. avail. Natl. Mar. Fish. Serv., Off. Int. Fish., Lang. Serv. Branch, Washington, D.C., 2 p.)

Gray whales: Korean-Okhotsk population, almost hunted out in the last century, is very small and appears to be decreasing. Search voyages in June and July 1967 and August 1974 in the Okhotsk Sea showed that only individual whales arrived there for the summer, and were sometimes seen in Tugur Gulf and western coastal areas. Gray whales are known to be caught off Korean shores. Right whales: Pacific right whales (Eubalaena glacialis sieboldii) are present in the central and northeast areas in the summer. Greenland right whales (Balaena mysticetus) are found in the western areas in the summer. Differences (e.g. angle of spout) have been discerned between Greenland right whales of the Okhotsk Sea and those of the Bering and Chukchi Seas and it is proposed that they are now separate subspecies after prolonged genetic isolation.

Berzin, A.A., and A.A. Rovnin.

1966. Raspredelenie i migratsii kitov v severo-vostochnoi chasti Tikhogo okeana, v Beringovom i Chukotskom moryakh (Distribution and migration of whales in the northeastern part of the Pacific Ocean, Bering and Chukchee Seas). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 58:179-207. In Russian. (Transl. by U.S. Dep. Inter., Bur. Commer. Fish., Seattle, Washington, 1966, p. 103-136 in K.I. Panin (ed.), Soviet Research on Marine Mammals of the Far East.)

Information on sperm, humpback, finback, blue, gray, and Pacific right whales has been gathered by Russian research vessels and whaling fleets, and is presented here. Migration patterns are shown to be complex and therefore the traditional concept of "American" and "Asiatic" stocks of whales should be abandoned. Three oceanographic factors are discussed as they relate to whale distribution: salinity of water, cyclonic current systems, and distribution of preferred food species. 8 fig.

Berzin, A.A., E.A. Tikhomirov, and V.I. Troinin.
1963. Izchezla li stellerova korova? (Is the Steller sea cow extinct?) Priroda 52(8):73-75. In Russian. (Transl. by Fish. Res. Board Can., 1965, Transl. Ser. 548, 4 p.)

Reports two sightings, possibly of sea cows, in vicinity of Point Navarin in July 1962. First sighting was of about six animals; second of one animal. Reviews reports of sea cows since their supposed extermination around 1768.

Bigg, Michael A.
1969. The harbour seal in British Columbia. Bull. 172, Fish. Res. Board Can., Ottawa, 33 p.

From author's abstract: "The results of a field study made on the harbour seal, Phoca vitulina richardi, in British Columbia are reported and discussed. The study, based on field observations and a collection of 415 specimens, describes the method of determining age, the reproductive cycle and ages at sexual maturity, prenatal and postnatal growth, and population composition and dymanics. .... The number of seals in British Columbia just prior to the pupping season is estimated to be at least 11,400; a more likely estimate is calculated to be about 35,000 seals." 9 tab., 19 fig., 30 ref.

1973. Census of California sea lions on southern Vancouver Island, British Columbia. J. Mammal. 54(1):285-287.

Between June 1971 and February 1972, 4 aerial and 2 land censuses were made. All the sea lions were adult or sub-adult males. On hauling out rocks, they prefer the inner, less exposed side of the islands. Census table given.

Bigg, M.A., and I.B. MacAskie.
1971. Report on Canadian pelagic fur seal research in 1971. Unpubl. manuscr., 24 p. Pac. Biol. Stn., Fish. Mar. Serv., P.O. Box 100, Nanaimo, B.C. V9R 5K6, Can.

(See Pike, Spalding, et al. 1958.) From January to April seals were hunted off southwestern Vancouver Island and Washington State. Tissue samples were collected for mercury and pesticide analyses. 7 tab., 6 fig.

1972. Report on Canadian pelagic fur seal research in 1971-72. Unpubl. manuscr., 21 p. Pac. Biol. Stn., Fish. Mar. Serv., P.O. Box 100, Nanaimo, B.C. V9R 5K6, Can.

(See Pike, Spalding, et al. 1958.) From December to February, seals were hunted off southwestern Vancouver Island. 8 tab., 3 fig.

1974. Report on Canadian pelagic fur seal research in 1972-3. Fish. Res. Board Can., Pac. Biol. Stn. Nanaimo, British Columbia, Manuscr. Rep. Ser. 1292, 21 p.

(See Pike, Spalding, et al. 1958.) From November to February seals were hunted off southwestern Vancouver Island. Two fur seals were seen in northern Johnstone Strait, Vancouver Island, in August. 8 tab., 4 fig.

1975. Report on Canadian pelagic fur seal research in 1973-4. Fish. Res. Board Can., Pac. Biol. Stn. Nanaimo, British Columbia, Manuscr. Rep. Ser. 1337, 20 p.

(See Pike, Spalding, et al. 1958.) In December and January seals were hunted off southwestern Vancouver Island and Washington. In June and July 1974 seals were hunted in Unimak Pass, Alaska. 9 tab., 4 fig.

Bishop, R.H.

1967. Reproduction, age determination, and behavior of the harbor seal, Phoca vitulina L., in the Gulf of Alaska. M.S. Thesis, Univ. Alaska, College, Alaska, 120 p.

This study was carried out in 1963 in Aialik and Harris Bays, and on Tugidak Island in 1964. Age was determined by dentition and cementum development. Females mature at 3-4 years and males at 5-6 years. Gestation is 271 days. Pupping occurs from 5 May to late June. Lactation lasts 3 weeks and ovulation occurs 2 weeks later. The stomachs of 4 collected animals contained octopus beaks and unidentified small fish. Description of breeding behavior, growth patterns, pelage and molt also included. In 1963, the author counted 500 seals at each of the 2 bays. In 1964, the estimates for Tugidak Island were 4-5,000 in May, 9,500-10,000 in June, and 6,000 at the end of July. The pup crop is estimated to be 5,500 annually.

Bockstoce, John.

1975. Contacts between American whalemen and the Copper Eskimos. Arctic 28(4)·298-299.

Copper Eskimos (of the western Canadian arctic) probably had contact with white men in the 1890's. Evidence comes from records of whaling ships and from ethnographic collections. Bowhead whalers were present in the vicinity of Banks Island, Victoria Island, Coronation Gulf, and the Coppermine River, in the 1890's.

1977. Eskimo whaling in Alaska. Alaska 43(9):4-6.

[This September issue contains several pieces concerning bowhead whaling.] Current conservationists' concern is that bowheads of the western arctic (the last important stock left) may be close to extinction and that paucity of scientific knowledge dictates careful husbandry. Beginning of Eskimo whaling is dated at 800 AD in northwest Alaska, and perhaps 1,000 years earlier on St. Lawrence Island. From this time until the 19th century Eskimos and whales lived within a stable ecosystem. From 1848-1908 Yankee whalers exploited bowheads of Alaska. During later years of this period (1880's to end), when bowhead stock had been considerably depleted, Yankee whalers established shore stations at Pt. Hope and Pt. Barrow and hired many Eskimos to hunt in the traditional manner (attracting natives from all over the Northern Interior). Number of native crews operating was then two or three times what the aboriginal

level had been. After the collapse of the baleen market in 1908, Eskimo whaling as a subsistence activity resumed. From 1910-1920 an estimated total of 10 whales per year were taken in all of Alaska, perhaps less than 1/4 of aboriginal take, because of depletion of stock by 60 years of commercial whaling. Eskimos continued to use weapons (darting gun, shoulder gun) introduced by Yankees, and subsistence hunt continued at a fairly constant level until about 1970. High-paying jobs (on the pipeline) became available and Eskimo whalers were able to buy thousands of dollars worth of commercially produced equipment. The number of whaling crews increased dramatically. Alaskan Eskimos took 48 bowheads in 1976 and in the spring of 1977 took 28 and reportedly struck and lost an additional 73. This trend is disturbing; however, the fact that no good estimate of the bowhead population is available makes resolution of the conservationist-Eskimo controversy difficult. 3 photos.

Bogdanov, L.V., V.A. Chernoivanov, V.I. Polyakovsky, and T.I. Bashurova.
1977. Biokhimicheskii polimorfizm severnogo morskogo kotika Callorhinus ursinus iz trekh raionov severo-zapadnoi chasti Tikhogo okeana (Biochemical polymorphism of northern fur seal Callorhinus ursinus from three regions of the north-west Pacific Ocean). Genetika 13(6):1008-1014. Akad. Nauk SSSR, Moscow. In Russian. (English summary)

Frequencies of genes for certain blood proteins were compared among northern fur seals from three regions: "Pelagic of Commander Islands (n=164), Rockery [sic] of Robben Island (Sakhalin population, n=308), winter todder [sic] region to the east of Honshu Island (n=110)." Reliable differences were found between fur seals of the Commander and Sakhalin populations. Fur seals from winter todder region were closer to the Commander Islands population than to the Robben Island population. Originality of gene frequencies of locus Ap (alkaline phosphatase), was found in the todder region animals. It is established that hemoglobin of northern fur seal consists of two components (Hb I + Hb II). Individual variability of hemoglobin results in the variation of the colour intensity of the "slow" component (Hb II)." 5 tab., 4 fig., 11 ref.

Borodin, R.G., and V.A. Vladimirov.
1975. (Evaluation of the present conditions of the Komandorskiye Islands fur seal population). Promysl. Ikhtiol. (7), Ref. Inf., Ser. 1, Min. Ryb. Khoz. SSSR: 7-8. In Russian. (Transl. avail. Natl. Mar. Fish. Serv., Off. Int. Fish., Lang. Serv. Branch, Washington, D.C.)

In 1973, the estimated fur seal population of the Komandorskiye Islands included: 77.0-107.8 thousand mature females and 1,787 mature males. Excessive killing of bachelor bulls from 1959-1967 has resulted in a deficit of mature males.

Braham, Howard W.
1977. California gray whale (Eschrichtius robustus) spring migration in Alaska. Abstr. only, in Proc. (abstracts), Second Conf. Biol. Mar. Mammals, San Diego, California, 12-15 December 1977, p. 59. (Avail. from author, Northwest and Alaska Fish. Cent., Natl. Mar. Mammal Lab., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.)

Data collected from aerial surveys, ships, and land camps since 1975 reveal that gray whales arrive in northeastern Gulf of Alaska in March, enter the Bering Sea through Unimak Pass by early April, and enter the northern Bering Sea by late May. Migration route is mainly coastal, to Nunivak Island; then it is offshore. Coastal migration route would make gray whales vulnerable to human-related near-shore perturbations (e.g., oil drilling).

Braham, Howard W., Robert D. Everitt, Bruce D. Krogman, David J. Rugh, and David E. Withrow.
1977. Marine mammals of the Bering Sea: a preliminary report on distribution and abundance, 1975-76. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Northwest and Alaska Fish. Cent., Mar. Mammal Div., Seattle, Wash., Processed Rep., 90 p.

Research was conducted in the Bering Sea between June 1975 and October 1976, and information on observed distribution and abundances is presented. Ice seals (ringed, bearded, larga and ribbon seals, with walrus observations included): Ice seal data were collected using long-range survey aircraft. Larga seals were the most numerous in Bristol Bay (southern Bering Sea), followed by bearded, ringed, and ribbon seals; north of 60°N, most commonly sighted were bearded seals, then ringed, then larga. Sea lions and harbor seals: These observations were made using smaller, more maneuverable aircraft. For sea lions, several "new" hauling areas were identified, and counts showed a population decline in the eastern Aleutian Islands area. Of harbor seals sighted, 80% were found along the north side of the Alaska Peninsula. Cetaceans: Cetaceans sighted during vessel and aerial surveys were gray, fin, minke, sei, killer, and goosebeaked (Ziphius) whales, and harbor and Dall porpoises. 13 tab., 49 fig., 73 ref.

Braham, Howard W., Robert D. Everitt, and David J. Rugh.
1977. Preliminary evidence of a northern sea lion (Eumetopias jubatus) population decline in the eastern Aleutian Islands. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Northwest and Alaska Fish. Cent., Mar. Mammal Div., Seattle, Wash., Processed Rep., 30 p.

A comparison of counts made in 1957, 1960, 1965, and 1968 with systematic counts made by the authors from June 1975 to June 1977 by aerial survey, shows a decline of 40-50% in the population of sea lions in the eastern Aleutian Islands (from Amak Island and Sea Lion Rock on the north side of the Alaska Peninsula (near the tip), to Samalga Island at the western end of the Fox Islands group). Statistical treatments are described. 7 tab.

Braham, Howard W., Clifford H. Fiscus, and David J. Rugh
1977. Marine mammals of the Bering and southern Chukchi Seas. In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 1-199. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder, Colo.

[Also appears as processed report. See Braham, Everitt, Krogman, et al., 1977.] Includes recommendations and summary of 4th quarter operations. 13 tab., 49 fig., 60 ref.

Braham, Howard W., and Bruce D. Krogman.
1977. Population biology of bowhead (Balaena mysticetus) and beluga (Delphinapterus leucas) whale in the Bering, Chukchi and Beaufort Seas. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Northwest and Alaska Fish. Cent., Mar. Mammal Div., Seattle, Wash., Processed Rep., 29 p.

Aerial surveys in the Chukchi and Beaufort Seas (from Point Hope to Barter Island) were conducted from 29 April to 20 June 1976 from Barrow, Alaska. Effort was concentrated in offshore areas between Barrow and Wainwright and north of Barrow to about 72°N Lat. At the same time (25 April - 2 June), whales passing in the shore lead north and northwest of Barrow were counted from two camps on shorefast ice. Aerial surveys were found to be more useful for counting belugas, ice camp surveys more useful for counting bowheads. The ice crew counted 259 bowheads and 309 belugas, and an additional 98 bowheads were counted by Eskimos. Aerial crew counted 108 bowheads, 1020 belugas. Pre-existing whale records are reviewed. Based on all observations combined, an offshore migration route for bowheads in the eastern Chukchi and Beaufort Seas is hypothesized, modifying the existing hypothesis of a near-shore route along the northern Alaska coast. Sightings (from several sources) of bowheads and belugas in the Bering and southern Chukchi Seas in 1976 are tabulated. Sightings of bowheads in the Soviet sector of the Bering and Chukchi Seas in fall 1974 and 1975 are tabulated. 3 tab., 11 fig., 34 ref.

Braham, Howard W., Bruce Krogman, and Clifford Fiscus.
1977. Bowhead (Balaena mysticetus) and beluga (Delphinapterus leucas) whales in the Bering, Chukchi and Beaufort Seas. In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 134-160. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder, Colo.

Reports on the same data as does Braham and Krogman (1977), and is similar in large part. Sightings of other marine mammals during 1976 aerial surveys of northeastern Chukchi and western Beaufort Seas are tabulated (bearded and ringed seals, walrus, gray whale, polar bear, unidentified whales and seals). Includes summary of quarterly activities.

Braham, Howard, Bruce Krogman, Stephen Leatherwood, Willman Marquette, David Rugh, Michael Tillman, James Johnson, and Geoff Carroll.
In press. Preliminary report of the 1978 spring bowhead whale research program results [SC/30/Doc. 36]. Rep. Int. Whaling Comm. 29. 57 p.

Describes operations through 30 May 1978. Research activities: Aerial surveys were flown over areas from St. Lawrence Island north to Pt. Barrow and eastward to Banks Island. Two ice camps were operated north of Pt. Barrow by the National Marine Fisheries Service (NMFS) beginning 15 April (expected to continue into June) to census passing whales. The Alaska Eskimo Whaling Commission sponsored an additional whale counting camp, also near Pt. Barrow. Eskimo whalers also provided input to census

activities. A land-based whale count was conducted by the NMFS from Cape Lisburne beginning 2 April (expected to continue into June). Biologists were stationed at St. Lawrence Is., Pt. Hope, Wainwright, and Barrow to monitor the harvest and collect biological samples. A study was carried out near Barrow on the feasibility of censusing whales with acoustic and sonar equipment. From Summary and conclusions: Based on ice camp counts the number of bowhead whales that passed Pt. Barrow between 15 April and 30 May was estimated at 2,264. Aerial surveys indicated that all migrating whales were within sight of the ice camp censusers. Observation conditions were better and counting effort was higher than in previous years. Migration route hypothesis previously proposed in Braham and Krogman (1977) was corroborated (i.e., in spring eastbound whales pass Barrow then head north and east offshore towards northwestern Banks Island). Vocalizations of bowhead whales were recorded successfully; sonar equipment tested proved inadequate for censusing. Both methods may be useful when refined. Ten whales were landed and five struck and lost as of 30 May. Chromosome number for one reported "ingutuk" whale was the same as that of bowhead. It is estimated that 29 calves may have been added to the bowhead population this year. The NMFS has taken steps to improve effectiveness of the darting gun and shoulder gun, malfunctions and/or misuse of which have caused whales to be struck and lost. 9 tab., 7 fig., 2 ref.

Braham, Howard, Bruce Krogman, Willman Marquette, David Rugh, James Johnson, Mary Nerini, Stephen Leatherwood, Marilyn Dahlheim, Ronald Sonntag, Geoff Carroll, Teresa Bray, Steven Savage, and James Cubbage.
1979. Bowhead whale (Balaena mysticetus) preliminary research results, June through December 1978. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Northwest and Alaska Fish. Cent., Natl. Mar. Mammal Lab., Seattle, Wash., NWAFC Processed Rep. 79-8, 40 p.

Fixed site counts: Spring counts by National Marine Fisheries Service (NMFS) at Barrow [See Braham et al., in press.] now undergoing further analysis; reports on behavioral observations progressing. Spring count from Alaska Eskimo Whaling Commission counting station at Barrow (24-28 April, 1-19,21-24 May) tabulated; 885 whales counted plus 39 "conditionals", with average watch of 21 hrs/day. This count was significantly lower than that of NMFS south camp; discrepancy possibly arises from differing watch periods, number of observers, and camp locations (5 km apart). Eskimo whalers' logbooks indicate "pulses" in bowhead migration April 14-21 at Gambell, May 1-3 at Pt. Hope, and April 19 - May 2 at Pt. Barrow (possibly the same whales), and (though notations were inconsistent) indicate relative numbers of bowheads and belugas recorded at Barrow, Pt. Hope, Gambell, and Savoonga. At Cape Lisburne between April 2 and June 7 during 690.7 hrs of watch, 280 bowheads were counted; this was extrapolated to 478. Interpretation of "duplicate" sightings discussed. Apparently most bowheads on spring migration do not begin moving into the nearshore lead until they pass Cape Lisburne. No research wil be conducted there in 1979. Daily observations made from vicinity of Gambell May 16 to December 31, 1978: sightings of bowhead, gray, fin, minke, beluga, and killer whales reported; bowheads seen routinely until May 20, not seen again with regularity until many sightings were made in January 1979 (somewhat later than usual). During 19 aerial and 3 vessel surveys June-September in

southern Chukchi-northern Bering area (including Soviet waters), no bowheads were seen, indicating that no more are still migrating north after the spring whaling season (as Townsend's (1935) records indicate they once did). (Sightings of other marine mammals during one vessel survey, June 14-July 15 in Bering and Chukchi Seas, are tabulated.) Preliminary biochemical-genetic studies indicate "ingutuk" whales not separate species from B. mysticetus. Fall bowhead harvest: 2 taken, 1 struck and lost at Kaktovik (making 1978 totals of 12 taken, 6 reported struck and lost). Hydrophone array tested on killer whales in Puget Sound, Washington, found capable of revealing presence and direction of movement. Feasibility of counting whales with passive sonar not demonstrated. High-quality recordings obtained of vocalizations of a bowhead under observation in western Beaufort Sea in October. 5 tab., 2 fig., 5 ref.

Braham, Howard W., and Stephen Leatherwood.
1978. Ingutuk: preliminary remarks on a morphological variation of the bowhead whale (Balaena mysticetus). Unpubl. manuscr., 12 p. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.

Paper addresses the question of the relationship of the bowhead whale to the smaller similar whale of the same distribution. References to this smaller arctic whale, variously called inyuto, inito, inyutok, kairalik, ingutuk (today's term), are reviewed. Twenty-two characters of Ingutuks which have been reported to differ from those of bowheads are tabulated. Ingutuks have been calculated to compose around 15% of the total bowhead population. Conclusion is that the two forms are not separate species, but that the Ingutuk represents a persistent genetic variation within the entire breeding population of bowhead whales. 2 tab., 21 ref.

Branson, J.H.
1968. Walrus sighting on Kodiak Island. Memorandum of January 24, 1968 (to Reg. Dir., Bur. Commer. Fish., Juneau) by J.H. Branson, U.S. Dep. Inter., Fish. Wildl. Serv., Bur. Commer. Fish., Kodiak, Alaska.

Reports a sighting on 8 or 9 September 1967 on the northwest side of Kodiak Island. The walrus was amidst a band of sea lions.

1971. Killer whales pursue sea lions in Bering Sea drama. Commer. Fish. Rev. 33(3):39-40.

On 23 January 1971, a pod of 7 whales was seen chasing a band of 20-25 Steller sea lions. The sea lions were taking refuge under the bow of a fishing trawler (position 54°18'N, 167°51'W). Within an hour, one sea lion strayed from the band and was taken. The outcome of the drama was unknown.

Bree, P.J.H. van -- SEE Van Bree, P.J.H.

Brooks, James W.
1954. A contribution to the life history and ecology of the Pacific walrus. Univ. Alaska, Alaska Coop. Wildl. Res. Unit, Spec. Rep. 1, Univ. Alaska, 103 p.

One of the first comprehensive treatises on the walrus. Details on classification, distribution, breeding biology, harvesting and management given. Data presented are from the eastern Bering and Chukchi Seas during the spring and summer of 1952-53. The distribution is bounded by the south end of the arctic ice pack, a line from Bristol Bay to the Gulf of Anadyr, and Pt. Barrow. Most of the population spends the summer in the western Chukchi. Bands of animals segregated by sex migrate separately. Females always migrate south in the winter, whereas males will occasionally remain residents on northern grounds. Explicit migration patterns given by month. The bivalve Mya truncata was the dominant food item with Molpadia arctica of secondary importance. Cows and immatures favor small mollusks like Astarte and Macoma in addition to worms. Population in 1953 is estimated at 15,000 in the eastern Bering Sea.

1957. Marine mammals in relation to commercial fisheries in Alaska. Science in Alaska, Proc. Eighth Alaskan Sci. Conf., Anchorage, Alaska, Sept. 10-13, 1957, p. 23-24. [Abstr. only.]

[Author represented Alaska Department of Fish and Game.] Of the 7 pinnipeds and more than 12 cetaceans common to Alaska, only the fur seal and the walrus are of major present commercial importance; however, Eskimos utilize ringed, bearded, harbor, and ribbon seals, and beluga, bowhead and gray whales on a smaller scale. Beluga whales, harbor seals, and northern sea lions are discussed as predators on commercial fish. Control of this predation is discussed.

1963. The management and status of marine mammals in Alaska. Trans. 28th North Am. Wildl. Nat. Resour. Conf.:314-325. Wildl. Manage. Inst., Washington, D.C.

Sea otters: Author, of the Department of Fish and Game of Alaska (Juneau), reviews the near-extirpation, recovery; notes recent experimental harvest by his department. Hair seals: Author notes bounty on harbor seals, recounts dynamiting of harbor seals in gill-net fishery areas, and Eskimo seal harvest. Ringed and bearded seals are noted as crustacean eaters; ribbon and elephant seals are rare. Pacific walrus: discusses population estimates (18th century - 200,000; early 20th century - 40,000; at present - at least 70,000), present kill and management. Polar bear: Harvested only by natives until about 1948 when airplane shooting by whites became possible and popular. Bag limits were imposed beginning in 1949. Most biological data come from harvested animals. Beluga whale: Total Alaska population is unknown; predation by belugas on red salmon in Bristol Bay river mouths has been studied by author and is discussed. Steller sea lion: Alaska population is estimated at 150,000-300,000. Because of disturbance to fisheries, there is discussion of starting a killing program. Special considerations: A bill to remove authority over sea otter, polar bear, and walrus from the state to the federal Department of the Interior (HR 7490, passed in 1962 by the House) is discussed.

In press. Status of marine mammal stocks in Alaska. Science in Alaska, Proc. 29th Alaska Sci. Conf., Fairbanks, Alaska, August 15-17, 1978, 17 p.

Legal status: Certain of Alaska's marine mammals are included in the terms of: the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, the International Whaling Convention (1948), the International Convention on Trade in Endangered Species of Wild Fauna and Flora (1975), the Interim Convention on North Pacific Fur Seals (US,USSR,Canada,Japan), an Agreement on the Conservation of Polar Bears (US,USSR,Canada,Denmark,Norway), the Fishery Conservation and Management Act of 1976, and the US-USSR Marine Mammal Project - Environmental Protection Agreement. Statuses of each of 13 cetaceans, 8 pinnipeds, sea otter, and polar bear are summarized in terms of 1) distribution and migration, 2) abundance and trends, 3) general biology, and 4) current research (if any). Cetaceans rare but known in Alaskan waters are noted but not discussed (i.e., narwhale, beaked whales, pilot whale). Author praises the work of the State of Alaska in research on marine mammals and voices support for the Alaska Department of Fish and Game's currently proposed research plans. 4 ref.

Brower, Ronald.
In press. Cultural uses of Alaska marine mammals. [This is an edited version of the transcript of Mr. Brower's presentation.] Science in Alaska, Proc. 29th Alaska Sci. Conf., Fairbanks, Alaska, August 15-17, 1978, 7 p.

Resident Native of Barrow comments on: recent changes in the arctic environment such as those related to oil development, confusion among Eskimos in transition period mixing traditional with Western culture, renewed use of beluga oil and seal oil as medicine, new ideas for use for baleen of bowhead, increase in catch and decrease in full utilization of walrus, use of spotted seal for clothing, enquiry into early history of Eskimo hunting of bowheads, Eskimo art (objects from beluga bones, dances) expressing interrelationship of people with animals, bowhead hunting controversy and protection of human rights.

Brown, S.G.
1974. Whale marking progress report 1973. Rep. Int. Comm. Whaling 24:60-61.

Table shows whales marked in 1972 and 1973, and Antarctic season 1972-3. Eleven species (including right, killer and pilot whales) were marked, 146 of those in the North Pacific. Short text accompanies table. Recovered marks totalled 44.

1975. Whale marking - progress report 1974. Rep. Int. Comm. Whaling 25:83-84.

Short text accompanies table entitled "Whales marked during 1973 and 1974, and in the Antarctic season 1973/74". Totals of 9 blue, 88 fin, 83 sei, 13 Bryde, 29 humpback, 1 bottlenose, 1 killer, 23 minke, 15 gray, 4 right, 328 sperm whales were marked. Soviet, Canadian, Norwegian, Japanese, and international cruises participated. In the North Pacific (1973) the Japanese marked 20 fin, 27 sei, 13 Bryde's, and 67 sperm whales and Russians marked 15 gray whales.

Brownell, Robert L., Jr.
1977. Current status of the gray whale. Rep. Int. Whaling Comm. 27:209-211.

Current and former distributions and population sizes of 2 Pacific and 2 (extinct) Atlantic stocks are discussed, along with history of exploitation (California stock apparently stable at about 11,000, Korean stock likely to become extinct without careful protection); problems of protection (industrial development and tourist harrassment around calving areas, threat of oil spills in northern feeding area, vulnerability of Korean stock to exploitation by non-signatories of the International Whaling Convention); and appropriateness of current "protection stock" designation (should remain so designated). 1 tab.

Bruemmer, F.
1969. The sea unicorn. Audubon 71(6):58-63.

Provides a historical account of the narwhal. Their distribution is given as the Canadian arctic although they are known to venture into the Chukchi Sea. Migration patterns are unknown. Estimates the Canadian - Greenland population to be 10,000.

Burgess, S.
1973. Marine mammal phenology in western St. Lawrence Island waters. Science in Alaska, Proc. 23rd Alaska Sci. Conf., Fairbanks, August 15-17, 1972, p. 49. [Abstr. only.]

From Eskimo activities it was determined that the highest concentration of seals in St. Lawrence waters occurs in late summer and fall, and is dominated by Phoca vitulina largha. Ringed seals are taken in winter. The bearded seal, ribbon seal, northern sea lion and walrus appear in the spring. Beluga and bowhead whales can be seen going south in December and heading north in April and May. Gray whales appear about the same time in spring and remain until late summer.

Burns, John J.
1965a. Marine mammal investigations in northwestern Alaska. Western Assoc. State Game Fish Comm., Proc. 45th Annu. Conf.:129-133.

Discusses biology and management of walrus and bearded seal, with concise presentation of natural history.

1965b. The walrus in Alaska: its ecology and management. Alaska Dep. Fish Game, Fed. Aid Wildl. Restoration Proj. Rep. Vol. 5, 48 p.

History of walrus exploitation, economic role in Alaska, and recent and current research are discussed. Research reported includes collection and examination of tusks, lower canine teeth, and reproductive tracts of females to determine reproductive behavior related to age; magnitude of Alaska harvest; collection of observations to determine migration and distribution patterns. Walruses first breed at about 6 years of age. Most mature females bear one calf every 2 years. Population is estimated at at least 90,000. Major food species are Mya truncata and Clinocardium

nuttalli (clams). Also discussed: predation on seals; seasonal migration and distribution; hauling out areas (including the Walrus Islands and the Punuk Islands); behavior. Extensive bibliography.

1965c. Marine mammal report. Alaska Dep. Fish Game, Div. Game, Fed. Aid Wildl. Restoration Proj. Rep. Vol. 6, 45 p.

Reports on research conducted in 1964. Walrus: major spring migration through Bering Strait occurred during the last week in May and the first week of June. This was at the same time as during previous years, in spite of an unusually slow retreat of the pack ice. Forty-one adult females examined were 64% parturient, 24% pregnant, and 12% barren. Parturition rate was found to be one calf every 2.02 years, among 29 animals. Also contains short sections on migration (with notes on correlates of ice movement), segregation of sexes, and foetal development, as well as reproductive investigations. Total walrus kill was 2,061 - 2,215; retrieved kill was 975 - 1040. In general it was a poor season (with high utilization) because of ice conditions, and economic impact is discussed. (It is noted that 10 or 12 whales, mostly grays, were taken at Barrow during summer.) Bearded seals: Bearded seal specimens have been collected since 1962 (mostly from 1964, an extremely poor walrus season). For 85 reproductively mature seals, average length was 91 in. and weights were up to 610 lb. Delay of implantation is 2-1/2 to 3-1/2 months, total gestation period about 12 months. Nursing period is short, 12-18 days, and by weaning time the pup has reached 69% of adult length. Migration is generally concurrent with the seasonal advance and retreat of the pack ice, although young seals are sometimes found where there is no ice. The retrieved kill of bearded seals in Alaska is approximately 3,000 animals per year, with a total kill of around 6,000.

1966. Marine mammal report. Alaska Dep. Fish Game, Fed. Aid Wildl. Restoration Proj. Rep. Vol. 7, 47 p.

Reports on research conducted in 1965. Walrus biology and populations: The main migration moved through Bering Strait 20 May - 18 June. Teeth examined from known-age walruses --current interpretation method validated. Female reproductive tracts examined (160 animals from nursery herd) -- 71% newly parturient, 21% pregnant, 8% barren. Females first breed at age 5 or 6, calve from then on, averaging one calf every 2.2 years. Adult females reach weight of about 2,100 pounds. About 2/3 of a walrus can be used for food. Walrus harvest and utilization: Total kill 3,213 - 3,322; retrieved kill 1,712 - 1,767. Utilization highest at Wainwright, with large human and dog populations. Positions and dates of walrus concentrations are noted. Seal biology and harvest: From just south of Nunivak Island to Barrow, 512 hunters harvested and bountied over 21,000 seals, more than half ringed seals, the rest bearded and harbor seals.

1967a. The Pacific bearded seal. Alaska Dep. Fish Game, Fed. Aid Wildl. Restoration Proj. Rep. Vol. 8, 66 p.

A thorough, general article. Reviews knowledge of biology, and current status. Incorporates original data compiled from 1962-1966 on 671 seals harvested by Alaskan natives; data relate to growth, reproduction and

feeding. Age determination is done using claws; teeth cannot be used because diet of hard-shelled animals results in extreme tooth wear. In northern Bering and Chukchi Seas, the southern boundary of range roughly coincides with southern edge of sea ice throughout the year. However, young animals are often found in ice-free waters (e.g., in Kotzebue Sound). Further details of timing of migration are given. Management considerations, population dynamics and behavior (including sound production) are discussed.

1967b. Marine mammal report. Alaska Dep. Fish Game, Fed. Aid Wildl. Restoration Proj. Rep. Vol. 8, 44 p.

Reports on research conducted in 1966. Walrus biology and population: Analysis of age composition of 353 male walrus taken at Savoonga indicated annual mortality rate of about 12% (maximum) for year classes 14 though 28, and about 14% (maximum) for year classes 14 through 33. Population apparently continuing to increase. Walrus observations reported from Nushagak Bay (May), Round Island in Bristol Bay (May-June), Big Diomede Island and the Punuk Islands (early December). Walrus harvest and utilization: Total kill about 5,600 animals; retrieved kill reported at 2,788 animals, one of the largest harvests by resident Alaskan hunters. Of these, 80% were taken by villages of Gambell, Savoonga, Diomede and King Island. It is noted that some male walrus winter, singly or in small herds, much further north than the main groups (occasionally as far north as 70°N Lat. in late February). Concentrations of animals were moving through Bering Strait May 28 to July 4. Main villages involved in the winter harvest (Jan. to mid-Apr.) are given, with their and dates of hunting. Summer harvest was successful only at Wainwright. Because harvest was high, and villagers do not stop hunting when needs of village are met but continue as long as animals are available, utilization of animals was relatively low. Dollar value of harvest and changes in populations of villages which traditionally take walrus, are discussed. Seal biology and harvest: The natural history and ecology of ringed, ribbon, bearded, and harbor seals and walrus in the northern Bering Sea are discussed. Their distribution in April-early May (pupping season) is mapped, and discussed as it corresponds to their different adaptations.

1970. Remarks on the distribution and natural history of pagophilic pinnipeds in the Bering and Chukchi Seas. J. Mammal. 51(3):445-454.

Author's abstract: "Five species of pagophilic (ice-loving) pinnipeds live in the Bering and Chukchi seas: Odobenus rosmarus, Phoca (Pusa) hispida, Phoca (Histriophoca) fasciata, an ice-breeding population of Phoca (Phoca) vitulina, and Erignathus barbatus. Breeding adults of these species are mostly separated from each other during late winter and early spring, when throughout the pupping and subsequent mating periods, P. vitulina and P. fasciata occupy the edge-zone of the seasonal pack ice, E. barbatus and O. rosmarus are mainly farther north within the heavier pack ice, and P. hispida occupies areas of extensive land-fast ice. This paper discusses differences in body structure, ecological adaptation, and behavior in relation to distribution of the five species." Distribution map.

1973. Marine mammal report. Alaska Dep. Fish Game, Fed. Aid Wildl. Restoration Proj. Rep. Vol. 13, 29 p.

Three research projects conducted in 1971 and 1972 were: "Spotted seal life history", "Analysis of biological aspects of the marine environment", and "Data analysis and reporting of investigations conducted to date". Cruises were conducted in the Bering Sea in March-April of both years, and in the Juneau area (where 21 harbor seals were collected), in November 1972. Table shows location, weight, length, sex, etc. of 76 harbor seals and 3 ribbon seals tagged. Fish and invertebrates were collected preparatory to studying pinniped feeding. Involvement with a satellite observation project was begun as a new way to monitor sea ice movement. Also included are status of stocks reports for the Marine Mammal Protection Act of 1972, for Phoca vitulina largha, Phoca fasciata, Erignathus barbatus and Phoca hispida. These include information on biological and commercial status, including seasonal distribution. Hair seal harvests in northern Alaska are tabulated for 1965, 1971 and 1972. 1 fig., 4 tab.

1977. Marine mammal management in northern Alaska: contemporary conflicts. Abstr. only, in Proc. (abstracts), Second Conf. Biol. Mar. Mammals, San Diego, California, 12-15 December 1977, p. 24. (Avail. from author, Alaska Dep. Fish Game, 1300 College Rd., Fairbanks, AK 99701.)

Political, sociological, economic and biological factors affect (native) harvests of polar bears, bowhead whales, walruses, seals and belukha whales.

1978. Ice seals. P. 192-205 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

Concerns ringed. larga, bearded and ribbon seals. [See Haley, 1978a.]

Burns, John J., and Loren W. Croxton.

1963. Marine mammal investigations. Alaska Dep. Fish Game, Fed. Aid Wildl. Restoration Proj. Rep. Vol. 3, 38 p.

Walrus biology and population status (1 April-30 June 1962): Northward migration passed Gambell May 8-24, Savoonga May 3-23, Bering Strait June 1-7. Collected for later examination were: 694 pairs of lower canine teeth, 163 female reproductive tracts, and 200 sets of eyes. Walrus harvest and utilization (1 May 1961 - 30 June 1962): 1961--total kill 2402-2972, harvest 1201-1486; 1962--total kill 2829-3064, harvest 1263-1353. Utilization varied widely village to village. Recommendations: decrease traffic in raw ivory, study dependency and interaction between Alaskan island villages and walrus, and changes in these relationships. Sea otter investigations: Between 16 Jan. and 25 Feb. 1962, 150 sea otters were shot at Amchitka Island. More research is suggested, in order to determine the optimum harvest season and harvest size for sea otters.

Burns, John J., and Thomas J. Eley.
1977. The natural history and ecology of the bearded seal (Erignathus barbatus) and the ringed seal (Phoca (pusa) hispida). In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 226-302. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder, Colo.

Bulk of this report concerns ringed seals. Existing information is summarized. Specimens obtained: 307 ringed, 133 bearded seals. Aerial surveys were flown over southeastern Bering Sea ice front, 27 March - 23 April (sightings of bearded and ringed seals shown on computer maps), and over landfast ice of the northeastern Chukchi and Beaufort Seas east to Barter Island, in June. Ringed seal discussion includes distribution and taxonomy, pelage, dentition, growth rates and productivity, polar bear predation on seals (25 cases tabulated), sex and age composition, literature review, and density of ringed seals (highest densities found between Cape Lisburne and Pt. Barrow). Some results of heartworm study are presented. Harvests of ice-associated marine mammals are totalled (ringed, bearded, spotted, and ribbon seals, beluga and bowhead whales, & polar bear). Results of stomach content analyses are reported elsewhere (See Lowry, Frost & Burns, 1977). Translation of Gol'tsev (1976) is appended to this report. 9 tab., 9 fig., 105 ref., + app.

Burns, J.J., and F.H. Fay.
1973. Comparative biology of Bering Sea harbor seal populations. Science in Alaska, Proc. 23rd Alaska Sci. Conf., Fairbanks, August 15-17, 1972, p. 48. [Abstr. only.]

Two populations of Phoca vitulina are described. P. v. largha inhabits the seasonally ice-covered areas of the Bering Sea (Bristol Bay), whereas P. v. richardii is found in southern ice-free water (Bristol Bay to Commander Islands). Largha seals migrate north and toward the coasts in the summer, from St. Lawrence Is. to Barter Is. Pair bonds form in March and last through the breeding season. Pupping occurs in late March to mid-April on the ice. The pup is suckled for 4 weeks. Maximum longevity is 35 years. Richardii seals are sedentary. Pupping occurs in late May to June on rocky islets or sandbars. The white coat is shed in utero. Maximum longevity is 30 years.

Burns, John J. and Samuel J. Harbo, Jr.
1972. An aerial census of ringed seals, northern coast of Alaska. Arctic 25(4):279-290.

Flights were made to survey the landfast ice from Point Lay to Barter Island, from 8-15 June 1970, to establish baseline distribution and density of ringed seals. The density of seals in sectors east of Point Barrow was low and relatively uniform (2.28, 1.06, 1.38, and 2.43 seals/mi^2). Within sectors southwest of this point, density was substantially higher (5.36 and 3.70 seals/mi^2). Minimum population was estimated at 11,612 animals. Areas of previous seismic oil exploration within the survey area were compared to undisturbed portions and no appreciable difference in ringed seal occurrence was found. 4 fig., 3 tab.

1977. Surveys of spotted seals, Phoca vitulina largha, in the ice front of the Bering Sea. Abstr. only, in Proc. (abstracts), Second Conf. Biol. Mar. Mammals, San Diego, California, 12-15 December 1977, p. 6. (Avail. from senior author, Alaska Dep. Fish Game, 1300 College Rd., Fairbanks, AK 99701.)

Survey flights were made during March and April 1976 and 1977. Large concentrations of sub-adult seals (1 to 5 years of age) occurred in western Bristol Bay in both years. Elsewhere density was lower and animals were mainly adults with pups. Overall, density ranged from 0 to 6.75 animals per nautical mile square.

Burns, John J., and James E. Morrow.
1973. The Alaskan arctic marine mammals and fisheries. Paper presented 5th Int. Congr. Found. Francaise d'Etudes Nordiques, called "Arctic Oil and Gas: Problems and Possibilities", May 2-5, 1973, Le Havre, France, 22 p. (Avail. from first author, Alaska Dep. Fish Game, 1300 College Rd., Fairbanks, AK 99701.)

Authors discuss fishes and marine mammals of the Chukchi Sea and the arctic coast of Alaska with respect to offshore oil development. Much of this discussion is pertinent also to the northern Bering Sea. Seismic exploration by several different concerns often involves a succession of explosions in the same areas, which destroy fish. Oil spilled in arctic waters will persist, due to the low temperature and slower decomposition, for 10 years or more. Marine mammals in the area are: polar bear, ringed seal, largha [sic] seal, walrus, bearded seal, beluga, bowhead, and gray whales, & harbor porpoise. Regular visitors are humpback, finback, sei, little piked and killer whales. Occasional visitors are listed as northern fur seal, Steller sea lion, ribbon seal, narwhal and blue whale. The harbor seal, harbor porpoise and beluga whale might suffer significantly from direct effects of oil development. Indirect effects are next discussed. Food webs in the arctic tend to be short, interdependence is high, and thus arctic ecosystems are very sensitive to disruption. Epontic algae grow on the under surface of the ice. Accidental or chronic gradual discharge of oil would spread under the ice, be trapped there for long periods of time, and either kill the algae there or be incorporated into the food chain from there on up. The same results can occur among benthic organisms when oil is deposited on the bottom. Destruction or pollution here will affect all higher consumers in the ecosystem.

Burns, John J., G. Carleton Ray, Francis H. Fay, and Peter C. Strickland.
1972. Adoption of a strange pup by the ice-inhabiting harbor seal, Phoca vitulina largha. J. Mammal. 53(3):594-598.

On 20 April 1971 at Lat. 57°51'N, Long. 165°54'W, the authors replaced the 4-week-old pup of a pair of seals with a previously captured 2-week-old pup. They subsequently observed the new pup nursing from the female. During their cruise from 11-20 April they sighted 103 pairs of adult harbor seals in the 20-mile wide ice front zone to the north and east of the Pribilof Islands. 2 photos.

Burns, John J., Lewis H. Shapiro and Francis H. Fay.
1977. The relationships of marine mammal distributions, densities and activities to sea ice conditions. In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 503-554. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder, Colo.

Using satellites, vessel surveys, and small aircraft surveys (mostly in March and April), information was gathered on (A) occurrence, duration, and interrelationships of ice conditions in 20 areas of the winter pack, (B) location and structure of the spring ice front (Ice front zone harbors main breeding populations of spotted and ribbon seals in winter-spring months during birth and nurture of young.), (C) development and duration of spring ice remnants (utilized by ribbon, bearded, and larga seals to rest and molt in May and June), and (D) seasonal distribution of marine mammals in relation to ice (walrus distribution data are mapped; ice conditions appear to be principal constraint on walrus distribution in winter). Annual ice cover in Bering and Chukchi Seas classified into seven types. Satellite imagery confirmed existence of broad flaw zone along northwestern coast of Alaska in winter; large polynyi south of Pt. Hope, western Seward Peninsula, eastern Chukotka, and St. Lawrence Island which tend to close with southerly storm winds; and highly variable ice conditions in Bering, Anadyr and Yukon Straits. 13 fig., 27 ref.

Caldwell, D.K., M.C. Caldwell, and D.W. Rice.
1966. Behavior of the sperm whale, Physeter catodon L. P. 677-717 in K.S. Norris (ed.), Whales, dolphins, and porpoises, Univ. California Press, Berkeley.

A review paper primarily discussing behavior, although information on habitat, diving, food, and senses is also given. Sperm whales appear to be most common in areas of divergence and cold, productive waters. Although males are cosmopolitan, females may be bounded by the 17° isotherm (40°N to 40°S). Migration occurs annually to higher latitudes in summer, and to the equator in winter months. Sperm whales are polygamous, and males are considerably larger than females. The diet is composed mainly of squid with demersal fishes and sharks occasionally taken. 1 fig., 174 ref.

Calkins, Donald, and Peter C. Lent.
1975. Territoriality and mating behavior in Prince William Sound sea otters. J. Mammal. 56(2):528-529.

Observations were made in small lagoon on south side of Stockdale Harbor, Montague Island, during July and August 1971. One pair of otters with pup, plus one other male, inhabited the lagoon. Aggression between males and patrolling of well-defined boundary zone is described. Attempted copulation was hindered by pup, which was nearly as large as its mother.

Calkins, Donald G., and Kenneth W. Pitcher.

1977a. Population assessment, ecology, and trophic relationships of Steller sea lions in the Gulf of Alaska. In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 433-502. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder, Colo.

Nearly half of Gulf of Alaska pups are produced at Sugarloaf and Marmot Islands (northern Kodiak Island area). A large proportion of these seals disperses in late fall to the east and possibly to the south. Reproduction and growth are discussed. A total of 7046 pups were branded. In June 1976, 37,973 sea lions were counted at 11 rookeries, and the total annual pup production is estimated at 17,950. Sixty hauling grounds have been located and are described individually. Examination of stomachs and large intestines from 83 sea lions showed primary food item to be pollack. 10 tab., 10 fig., 32 ref.

1977b. Unusual sightings of marine mammals in the Gulf of Alaska. Abstr. only, in Proc. (abstracts), Second Conf. Biol. Mar. Mammals, San Diego, California, 12-15 December 1977, p. 53. (Avail. from first author, Mar. Mammal Biol., Alaska Dep. Fish Game, 333 Raspberry Rd., Anchorage, AK 99502.)

Twenty-one belukha whales were seen in Yakutat Bay, 400mi outside known normal range. California sea lion (1 sighting, apparently the first documented sighting in Alaska), and northern elephant seal (3 sightings) were also seen outside normal ranges.

Calkins, Donald G., Kenneth Pitcher, and Karl Schneider.

1975. Distribution and abundance of marine mammals in the Gulf of Alaska. Unpubl. manuscr., 39 p.+ 31 charts. Alaska Dep. Fish Game, Div. Game, 333 Raspberry Rd., Anchorage, AK 99502.

Report prepared under an OCSEAP [Outer Continental Shelf Environmental Assessment Program (Bureau of Land Management)] contract to NOAA [National Oceanic and Atmospheric Administration]. Sea otter, northern sea lion, and harbor seals discussed at length. Other marine mammals mentioned: northern fur seal, black right whale, gray whale, minke whale, sei whale, fin whale, blue whale, humpback whale, north Pacific white-sided dolphin, killer whale, harbor porpoise, Dall porpoise, sperm whale, Bering Sea beaked whale (Mesoplodon stejnegeri), goose-beaked whale (Ziphius cavirostris), northern right whale dolphin, short-finned pilot whale, belukha, Pacific giant bottlenosed whale (Berardius bairdi). Charts show sea lion and sea otter distribution; others show harbor seal density. 4 tab., 31 charts, 26 ref.

Carlson, Richard.

1975. Nose to nose with a sea lion. Alaska 41(10):48.

Author describes encounter with 25-30 peaceful, curious Steller sea lions during scuba diving at 60 feet in Auke Bay near Juneau, Alaska. photos.

Chapman, D.G.

1973. Management of international whaling and North Pacific fur seals: Implications for fisheries management. J. Fish. Res. Board Can. 30(12) part 2:2419-2426.

Since 1911 fur seal management aims have changed from restoring depleted herds, to developing exploitation strategy for abundant herds. Whale stocks have not been managed so effectively by the unwieldy and powerless International Whaling Commission. Many baleen whale stocks have been decimated; sperm whale stocks deserve close attention now that their exploitation is increasing. Fish stocks have a much larger replacement rate and hence can sustain more exploitation, but foresight and lessons from past management programs must be applied.

In press. Marine mammals and ecosystem management. Science in Alaska, Proc. 29th Alaska Sci. Conf., Fairbanks, Alaska, August 15-17, 1978, 18 p.

In addition to establishing a moratorium, the Marine Mammal Protection Act opened new ground in legislative activity, not only introducing the optimum sustainable population concept, but also focusing management on the ecosystem concept. Most of the discussion relates to this Act, and includes fisheries/marine mammals interactions (including tuna/porpoise and salmon/seal situations), subsistence exemptions (involving bowhead whale and other Alaskan marine mammals), and human impact other than exploitation (involving stress, mortality and loss of habitat among monk seals, manatees, sea otters, harbor and gray seals, and gray whales). The difficulty of applying ecosystem management is illustrated with the examples of 1) the Antarctic krill fishery (in competition with whales and seals), 2) a potential Bering Sea clam fishery (competing with walruses), and 3) northern fur seals (which may be suffering from the competition of the Bering Sea groundfish fishery; however, the ecosystem relations of even this most studied marine mammal are not known for certain). 1 tab., 6 ref.

Chapskii, K.K.

1967. Morfologo-taksonomicheskaya kharakteristika pagetodnoi formy largy Beringova morya (Morphological-taxonomical nature of the pagetoda form of the Bering Sea larga). Tr. Polyarn. Nauchno-issled. Proektn. Inst. Morsk. Rybn. Khoz. Okeanogr. (PINRO) 21:147-176. In Russian. (Transl. by Fish. Res. Board Can., 1968, Ottawa, Transl. Ser. 1108, 68 p.)

During April to July 1964, 80 specimens and 60 additional skulls of the larga seal were collected from drifting ice in the Bering Sea. Color patterns, craniological features and dentition are discussed. Author suggests that the sub-species, Phoca vitulina largha should be a species named Phoca largha.

Chugunkov, D.I., and V.G. Prokhorov.

1966. Novye svedeniya o zimovke kotikov v Beringovom more (New information on the wintering of fur seals in the Bering Sea). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 58:233-234. In Russian. (Transl. by Dep. Inter., Bur. Commer. Fish., Seattle, Wash., 1966, p. 137-139 in K.I. Panin (ed.), Soviet research on marine mammals of the far east.)

Fur seals, single animals or groups of up to ten, have been encountered regularly in the course of winter herring trawling in Olyutorsk Bay. Among them, three animals with American tags were caught: two males and one female. Sea lions occur there in greater numbers, and both species follow the vessels, feeding on herring and Alaska pollock from the nets. Figure shows fur seal encounters over years 1959-1964, by month.

Clarke, Robert.
1957. Migration of marine mammals. Norsk Hvalfangst-tid. 46(1):609-630.

A general review of migrations of the large whales and of a small number of small cetaceans, fur seals, phocid seals, and walruses. Notes lack of understanding of mechanisms of migration. 11 fig., 76 ref.

Cowan, I.M.
1939. The sharp-headed finner whale of the eastern Pacific. J. Mammal. 20(2):215-225.

Two specimens (minke whales) are described. Skeletal measurements of animals taken from Atlantic and Pacific are compared.

1944. The Dall porpoise, Phocoenoides dalli (True), of the northern Pacific Ocean. J. Mammal. 25(3):295-306.

Five animals were collected in the summer of 1939 from waters adjacent to Queen Charlotte Sound, B.C. They were examined in detail to ascertain the variation in external and skeletal features. Four of the stomachs were full and contained only herring. Measurements and 5 photos are included.

1945. A beaked whale stranded on the coast of British Columbia. J. Mammal. 26(1):93-94.

Article refers to the stranding of a beaked whale on 25 May 1941, at Estevan Point, Vancouver Island. The cetacean was first incorrectly identified as Hyperoodon rostratus. Subsequent identification as a species of Ziphius is corroborated. Author suggests that the misleading bulbous forehead of the Estevan specimen was perhaps due to age.

Cowan, I.M., and G.C. Carl.
1945. The northern elephant seal (Mirounga angustirostris) in British Columbia waters and vicinity. Can. Field-Nat. 5(9):170-171.

Reports many sightings of elephant seals by various fishermen and Makah natives of British Columbia. Suggests M. angustirostris is not uncommon in these latitudes.

Cowan, I.M., and C.J. Guiguet.
1952. Three cetacean records from British Columbia. Murrelet 33(1):10-11.

1)Lagenorhynchus obliquidens (Gill): Skull found in June of 1943, at Estevan Point, Vancouver Island. 2)Stenella euphrosyne (Gray): Skull found in Nootka Sound, Vancouver Island, during the winter of 1948. 3)Ziphius cavirostris (Cuvier): Badly worn skull from Fisherman's Bay, Cape Scott, Vancouver Island, found in 1950; part of a lower jaw found at Estevan Point in 1945.

Cowan, I.M., and J. Hatter.
1940. Two mammals new to the known fauna of British Columbia. Murrelet 21(1):9.

A skull of Ziphius cavirostris was found on the north tip of Vancouver Island in 1937. The other mammal mentioned was a rabbit (Sylvilagus nuttalli nuttalli).

Daetz, G.M.
1959. Alaskan challengers of the sea. Nat. Hist. 68(6):334-347.

Picture article on Steller sea lions based on a summer's experience at Rookery Islet, off Montague Island, Prince William Sound, Alaska. Rookery behavior and parasites are described. 22 photos.

Dawbin, W.H.
1966. The seasonal migratory cycle of humpback whales. P. 145-170 in K.S. Norris (ed.), Whales, dolphins, and porpoises, Univ. Calif. Press, Berkeley, Calif.

A general discussion of factors influencing migratory routes, migration rate and timing. Data drawn almost exclusively from the southern hemisphere. Migration is south in winter, north in summer along coastlines. Travel north is in same direction as cold current.

DeLong, Robert L.
1978. Northern elephant seal. P. 206-211 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

Doi, T., T. Nemoto, and S. Ohsumi.
1967. Memorandum on results of Japanese stock assessments of whales in the North Pacific. Rep. Int. Comm. Whaling 17:111-115.

Gives tables on natural mortality, population size and sustainable yield for fin, sei, blue, humpback, Bryde's, and sperm whales. Values given for each of six areas in the North Pacific. Age composition given for sei population.

Doroshenko, N.V.
1971. Kit s priznakami finvala i blyuvala (A whale with the features of fin- and blue whales). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 70:255-257. (Transl. avail. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115, 4 p.)

In August 1965, a female whale, 19.7m long, was taken northeast of Kodiak Island. It appeared to be the offspring of a fin whale and a blue whale. Ovaries showed what appeared to be evidence of ovulation, but none of pregnancy. Table compares characteristics of blue whales, fin whales, and the hybrid whale.

Doroshenko, N.V., A.A. Kuz'min, O.R. Nikol'skii, and N.M. Pashchenko.
1974. O razmnozhenii malogo polosatika (A study of the reproduction of the minke whale). P. 145-152 in S.M. Konovalov (ed.), Issledovanya po biologii ryb i promyslovoj okeanografii, Vypusk 5 (Studies on fish biology and fishery oceanography, Issue 5). Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO), Vladivostok, USSR, 166 p. In Russian. (Engl. abstr. in Aquat. Sci. Fish. Abstr. 5(4):128 (abstr. #5Q3944).)

A brief review of the material on the reproduction biology of minke whales available from literature is followed by an account of findings based on material collected during the Antarctic whaling seasons of 1968-1973. The smallest mature male measured 7.0m and the largest immature male was 8.1m long. Females were found to attain sexual maturity at the length of 8.0-8.1m. The pregnancy lasts 10-11 months; calves measure 300-330cm at birth.

Durham, Floyd E.
1972a. Eskimo effort in bowhead whaling at Pt. Barrow, Alaska. Unpubl. manuscr., 19 p. (Avail. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.)

Author describes transition from self-sufficiency to dependence on outside industries, from barter system to modern monetary system, from full utilization to commonplace waste in whaling; cost of whaling as it is now done (with store-bought equipment). In conclusions it is noted that though bowhead whaling was for centuries the mainstay of a very successful subsistence economy, it is now an unprofitable "luxury sport". "Nevertheless, the instinct to kill, the intent to survive, and the notoriety of a whale kill remains."

1972b. Greenland or bowhead whale. P. 10-14 in Alice Seed (compiler), Baleen whales in eastern north Pacific and arctic waters, Pacific Search Books, Seattle, Wash.

Adaptations of whales since Miocene times are sketched, focusing on development of three genera of the ice environment: bowhead, belukha, and narwhal. Predation upon bowhead is inconsequential, disease almost nonexistent. Absence of dorsal fin facilitates navigating under ice. A large bowhead would contain some 600 baleen plates up to 13 ft. long, weighing perhaps a ton. On a diet of plankton, bowhead avoids fish, larger crustaceans, and mollusks - the secondary hosts of most internal parasites of marine mammals. Five known drift ice advances from 1600 to 1910 cut whales off from their preferred summer feeding grounds and contributed considerably to the decline of the bowheads of Greenland. The same drift cycle probably occurred off the Alaskan coast and was in its concluding melting phase in mid-19th century at the beginning of

commercial whaling there. After 1853-54 (greatest harvest of oil and baleen) ice increased and harvest decreased. Subcycles in these 60-year ice cycles are discernable today (viz 1968).

1972c. History of bowhead whaling. P. 5-9 in A. Seed (compiler), Baleen whales in eastern north Pacific and arctic waters, Pacific Search Books, Seattle, Wash.

Bowhead whaling is traced beginning with coastal Eskimo villages' subsistence hunt. Then Eskimos begin to supply their inland neighbors with bowhead products. European bowhead whaling begins, first in Spitsbergen area east of Greenland (1610), then further west towards Greenland coast, then around Greenland into waters off Canada, decimating these stocks. Yankee whalers discover and decimate bowhead stock in Okhotsk Sea in northwest Pacific (1840's). Yankee whalers discover and hunt bowheads north of Bering Strait (1848), later extending this whaling activity into the Beaufort Sea (1889), and devastate this stock. After development of fossil fuels, demand for baleen alone kept bowhead fishery alive until 1904. Invention of plastics saved the whale. After 1910, the arctic was abandoned. Killing bowheads for baleen only was particularly damaging to the stock since large breeding animals with long baleen were selectively hunted. Remainder of whale was wasted.

1973. Ancient and current methods of taking the bowhead whale. Univ. Alaska, Sea Grant Program, Alaska Sea Grant Rep. 73-9, 15 p.

Some methods of primitive whale-hunting societies are described briefly. Early Eskimo bowhead whaling is described, including taboos, charms, ritual, and legend relating to the hunt. Discussion of Yankee whalers as bowhead hunters in late 1800's includes the prior development of their commercial whaling techniques. Effect on Eskimo whaling of Yankee whalers is discussed. International whaling codes (and their failure to recognize that the methods being used in "aboriginal" whaling included those weapons introduced by Yankee whalers) are outlined. From summary and conclusions: "By the beginning of the 20th century . . . the old Eskimo technique had been forgotten and the new Yankee technique had been corrupted. . . . The opportunity is ripe to relearn the old Eskimo hunting skills and to reteach the Yankee technique of killing whales from open boats." 5 photos, 22 ref.

1979. The catch of bowhead whales (Balaena mysticetus) by Eskimos, with emphasis on the western arctic. Contrib. Sci. Nat. Hist. Mus. Los Angeles Cty. 314:1-14.

Author's abstract: "The success of Eskimo spring whaling along the northwestern coast of Alaska depends on the opening of offshore leads in the sea ice, the presence of bowheads, and the number and ability of the hunters to kill, secure, and butcher these animals. Physical factors, such as wind, current, and temperature affect the formation of leads. The number and proximity of leads to shore, the frequency and manner of passing of bowheads, and the topography and duration of the ice platform are variable, but are most dependable at the promontories where the major whaling villages are located.

The time period and the actual number of years for which data are available (in parentheses), the number of whales killed, and the yearly average at the principal villages are: Barrow, 1852-1973 (52 yrs), 371 whales, 7/yr; Pt. Hope, 1879-1973 (60 yrs), 241 whales, 4/yr; and Wainwright, 1922-1973 (32 yrs), 48 whales, 1.5/yr.

The total of the three villages is 660 whales with a combined average of 12.5/yr. Five of the several minor stations active from 1961 to 1973 took 22 whales, average of 2/yr, making a total average of known whales secured in Alaska 14.5/yr through 1973. Recent harvests (1974-1977) have been considerably higher than the stated average." 1 tab., 4 fig., 32 ref.

Eley, Thomas J.
1977. An analysis of polar bear predation on ice-inhabiting pinniped populations of Alaska. Abstr. only, in Proc. (abstracts), Second Conf. Biol. Mar. Mammals, San Diego, California, 12-15 December 1977, p. 18. (Avail. author, c/o Fairbanks North Star Borough Animal Shelter, Box 1267, Fairbanks, AK 99707.)

Field studies beginning in March 1976 conducted at Cape Lisburne and Barrow, Alaska, showed that polar bear diet in spring consists of 92% ringed seal and 5% bearded seal. Primarily male ringed seals are taken. Most are taken at breathing holes in the ice. Polar bear movements and population size appear directly dependent on ringed seal population.

Engelhardt, F. Rainer, Joseph R. Geraci, and Thomas G. Smith.
1977. Uptake and clearance of petroleum hydrocarbons in the ringed seal, Phoca hispida. J. Fish. Res. Board Can. 34(8):1143-1147.

Authors' abstract: "Ringed seals showed rapid absorbtion of petroleum hydrocarbons from Norman Wells crude oil into body tissues and fluids when exposed by both immersion and ingestion. Relatively low but significant levels were found in tissue, blood, and plasma. Levels in bile and urine were high, indicating these to be routes of excretion." 1 tab., 2 fig., 26 ref.

Estes, James A.
1977. A discussion of assessment problems: walruses and other ice inhabiting pinnipeds in the Bering/Chukchi region. Preliminary working paper from a meeting of the Project on Marine Mammals within the framework of the US/USSR Agreement on Environmental Protection, 18-25 January 1977, La Jolla, Calif., 14 p. (Avail. from author, Univ. Calif., Cent. Coastal Mar. Stud., Div. Nat. Sci., Applied Sci. Build., Santa Cruz, CA 95064.)

Four methods of assessing populations are discussed: (1) direct sightings -- Aerial surveys by U.S. scientists in fall, 1975 (coordinated with Soviet surveys) indicated that estimates of population abundance by aerial surveys over ice are extremely variable [See Estes and Gilbert, 1978]. Recommendations for future aerial surveys over pack ice include: systematic, rather than random, sampling design; photographs of high enough resolution to determine sex and age of walruses; testing for individual differences among observers' visual estimates; fixed strip

width samples. (2) Catch per unit effort -- The Alaska Department of Fish and Game has 15 years of catch records, but conditions have not been constant. Problems are discussed. (3) Mark-recapture -- Some thousands of walruses would have to be marked to obtain a return useful for a population estimate; several years would be needed with an ice-breaking ship and good techniques for handling walrus. (4) Analysis of catch statistics -- Before stable age distribution and rate of growth or decline of a population of walrus can be determined, biological parameters must be known, and stocks must be identified. For the latter, direct sightings seem most reliable at this time; need is for knowledge of activity and behavior. A reliable method of age determination is needed. U.S. and Soviet age determinations (by tooth sections) are now being compared to check that results are consistent. Biological data from native harvests in Alaska have just begun to be collected. Possible means of assessment of biases in catch data are discussed.

Estes, J.A., and J.R. Gilbert.
1978. Evaluation of an aerial survey of Pacific walruses (Odobenus rosmarus divergens). J. Fish. Res. Board Can. 35:1130-1140.

Authors' abstract: "An aerial survey of Pacific walruses (Odobenus rosmarus divergens) was evaluated to determine the reliability of estimates of population abundance. [The surveys were flown over the eastern half of the Chukchi Sea over the period 1-12 September 1975, in conjunction with Soviets' surveys over the western half. See Gol'tsev, 1976.] The probability of detecting groups of walruses on the pack ice remained uniform to at least 0.93 km from the flight line, whereas the probability of detection decreased significantly beyond 0.23 km for walruses in the water. Walruses were more abundant along the ice-edge zone between 162 and 165°W than in other areas of the Chukchi Sea during September 1975. Few walruses were observed in consolidated pack ice north of the ice-edge zone or in ice-free water to the south. More walrus groups and larger mean group size were observed on September 8 than on other dates. We estimated abundance for each day and all days combined using methods based on sample area and numbers of strip samples. Estimates varied among days by over an order of magnitude; this variation is attributed to the combined effect of chance sampling of an aggregated population and variation in the fraction of walruses hauled out. The coefficient of variation of the estimates ranged between 0.25 and 0.99. [From text: "Population estimates ranged from 818 to 1760 in the open-water area, while in the ice-edge zone these estimates ranged from 2475 to 100 568. All estimates of total abundance lacked precision...."] This imprecision was due to the aggregated distribution of walruses and the large variation in group size. Using the survey data as a basis for stratification, we calculated that, due to the high variability within strata, a sample size of 40% of the total area or 56% of the total available strips would be required to obtain 95% confidence limits within 10% of the estimate of total abundance. Variation contributed by observer error in estimating group size also is relatively unimportant to the precision of abundance estimates. Studies of natural history, particularly those oriented toward activity and habitat selection would help investigators estimate bias due to the variable fraction hauled out

and design surveys based on meaningful strata. Estimates of total abundance based on limited survey efforts will provide information of little reliability." 9 tab., 4 fig.,14 ref.

Everitt, Robert D., and Howard W. Braham.
In press. Harbor seal distribution and abundance in the Bering Sea: Alaska Peninsula and Fox Islands. Science in Alaska, Proc. 29th Alaska Sci. Conf., Fairbanks, Alaska, August 15-17, 1978, 21 p.

Between June 1975 and July 1976, six aerial surveys were conducted along the north Bristol Bay coast from Cape Newenham to Kvichak Bay, the north side of the Alaska Peninsula, and the eastern Aleutian Islands as far west as Samalga Island. Harbor seals (Phoca vitulina richardii) were present throughout the survey area; 80% of the total number observed were on eight hauling out areas along the north side of the Alaska Peninsula. The maximum harbor seal count for the north side of the Alaska Peninsula (June 1976) was 25,802. The maximum count for the eastern Aleutian Islands (August 1976) was 4,023. (These counts are conservative.) Seventy percent more seals were observed on a low tide than in the same area surveyed near high tide (tidal range 10 to 12 feet). A minimum abundance estimate for the study area is 28,000 to 30,000. 3 tab., 3 fig., 22 ref.

Everitt, Robert D., and Bruce D. Krogman.
In press. Sexual behavior of bowhead whales observed off the north coast of Alaska. Arctic 32(3), 4 p.

At 1620 hours on 8 May 1976 approximately 32 km east of Point Barrow ($71^{o}24.4'N$, $156^{o}11.0'W$), authors observed a group of six bowhead whales engaged in sexual behavior in an open water "lead" in the pack ice. A series of 15 35mm photographs were taken using a motor drive attachment. A representative photo is included. [One of this series of photos is published in Krogman, 1977.] To facilitate discussion of the sequence of events, the whales are numbered and outlined in a sketch made from the photograph shown. One whale, with his penis protruding, was apparently trying to copulate with another. The latter may or may not have been a female; intromission was not observed. Eight other articles concerning sexual behavior of bowheads, southern right whales, gray whales, and dolphins, are cited.

Fay, Francis H.
1952. The Pacific walrus: a progress report of field investigations conducted during 1952. Arctic Inst. North Am., Montreal/Washington/New York, Proj. ONR-77, 17 p.

During May and June 1952, 191 walruses were examined from St. Lawrence Island. Distribution patterns are sketched out. Ageing techniques based on growth layers of the teeth are described. Life history and harvest are briefly discussed. Food samples collected consisted of 5 species of mollusks, 3 species of crustaceans and an echuiroid. 2 fig.

1953. The Pacific walrus: a progress report of laboratory work on the specimens collected in the 1952 field season. Arctic Inst. North Am., Montreal/Washington/New York, Proj. ONR-77, 4 p.

From 56 tusks collected in 1952 from St. Lawrence Island, age determinations were attempted. It was thought that each ring of the dentin layers represents a breeding season, and the layers between rings correspond to one year's growth. Wear at the tip varies with age and prevents precise age determination. Cheek teeth, baculum and os clitoris were also examined in an attempt to age specimens.

1954. The Pacific walrus: a progress report of field and laboratory work in 1954. Arctic Inst. North Am., Montreal/Washington/New York, Proj. ONR-77, 10 p.

Due to strong easterly winds apparently driving the ice and walrus near the Siberian mainland, walrus hunting was the poorest in 30-40 years. Bearded seal hunting was also poor. Further laboratory investigation during 1954 on the tusks, teeth, claws and body measurements of walruses indicate no method is an exact age determinant for all age classes and both sexes.

1955. The Pacific walrus (Odobenus rosmarus divergens): spatial ecology, life history, and population. Ph.D. Thesis, Univ. British Columbia, Vancouver, B.C, 171 p.

Life history is given, detailing reproduction, the young, growth and mortality. Distribution is defined by accessibility of food, air, haul-outs, as well as ambient air temperature. Walruses must stay south of the unbroken polar ice pack in summer, and south of the northern Bering and Chukchi Seas in winter. Further restrictions are imposed by the need for hauling places. This limits the walruses to coasts or the ice front where floes are common. In addition, the major food (pelycepods) can be found in 0-50 fathoms of water. Ostensibly, the southern limit is influenced by the air temperature, and appears to coincide with the 50°F isotherm. Exception to this is the herd in Bristol Bay where extreme temperatures may reach 80°F. The total world population of Pacific walrus is given as 40,000 animals.

1957. History and present status of the Pacific walrus population. Trans. 22nd North Am. Wildl. Conf.:431-443. Wildl. Manage. Inst., Washington, D.C.

The population from 1650 to 1850 (extrapolated from archeological digs) is estimated at 200,000. By the 1900's the range had been significantly reduced and the population numbered less than 100,000. Between 1900 and 1930, the range was further reduced, and few walruses were observed below 60°N. There was little change in the population from 1930-1950, remaining about 60,000. Reduction in range is attributed to a lack of population pressure. Walrus harvest is reviewed. Suggests actions to assist walrus management.

1958. Pacific walrus investigations on St. Lawrence Island, Alaska. Unpubl. manuscr., 54 p. Alaska Coop. Wildl. Res. Unit, U.S. Pub. Health Serv., Arctic Health Res. Center, Anchorage, AK.

Summarizes author's observations 1952-1958 on walrus hunting at Gambell. Average annual harvest was about 170. Outlines history of Gambell walrus hunt. Describes procedures and degree of success of hunting, uses of walrus products, percent utilization, and possible alternatives to walrus products for native use. People of Gambell are discussed with regard to future management strategy. Management should decrease number of animals unretrieved during hunting and increase utilization. It is noted that northern sea lions and harbor seals are found on south and east coasts of island in late summer and fall. 7 tab.

1960. Carnivorous walrus and some arctic zoonoses. Arctic 13(2):111-122.

Zoonoses are diseases of lower animals that can be transmitted to man. Information on carnivorous walrus is reviewed. Eskimos report that eating carnivorous walrus liver produces the same illness as does eating polar bear liver. Both species eat largely ringed and bearded seals. This illness is probably hypervitaminosis-A. Trichinosis has been identified with some walrus meat, but the incidence of infected walruses seems very low.

1963. Unusual behavior of gray whales in summer. Psychol. Forsch. 27:175-176.

On 26 July 1960, near Kangee on the southern coast of St. Lawrence Island, the author observed three whales involved in what appeared to be courtship behavior, and possibly copulation.

1974. The role of ice in the ecology of marine mammals of the Bering Sea. P. 383-399 in D.W. Hood and E.J. Kelley (eds.), Oceanography of the Bering Sea, Inst. Mar. Sci., Univ. Alaska, Fairbanks.

Describes different kinds of ice; describes seasonal changes of ice and corresponding movements of marine mammals. Lists 25 species of marine mammals in 3 categories according to contact with ice. Offers good detail, understanding of habitats, and insights into evolution.

1975a. Mammals and birds. P. 133-138 in D.W. Hood and Y. Takenouti (eds.), Bering Sea Oceanography: an update. Rep. No. 75-2, Inst. Mar. Sci., Univ. Alaska, Fairbanks, Alaska.

Contains: (1) Estimates of biomass of marine mammals in Bering Sea, and biomass consumed and produced by them; (2) descriptions, in varying detail, of about 15 recent and/or current marine mammal research projects, with their sources of funds, involving eight federal agencies, Alaska Department of Fish and Game, and four universities; (3) brief account of birds: estimated numbers and biomass, paucity of knowledge, recent study by U.S. Fish and Wildlife Service. Items discussed include: (a) new knowledge of walrus biology, (b) new and sophisticated research tools tried, (c) investigation of ecological role of benthic feeding ("tilling the benthic soil") by walrus and gray whale, and (d) possibility that commercial fishing has depleted fur seals' food supply to the extent that their productivity is reduced.

1975b. Morbidity and mortality of marine mammals. In Environmental assessment of the Alaskan continental shelf, Principal investigators' reports, July - September 1976, Vol. 1, p. 35-42. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Labs., Boulder, Colo.

Several areas of Alaska coastline were surveyed for marine mammal carcasses: the north coast of the Alaska Peninsula from Bechevin Bay to the mouth of the Naknek River; the eastern shore of Kuskokwim Bay from Chagvan Bay to Jacksmith Bay; the coast of St. Lawrence Island; the Punuk Islands; and Kotzebue Sound from Sheshalik to Point Hope. Nearly four hundred carcasses were found. Well over half of these were walrus, with thirteen species in all. Causes of death included gunshot, trauma, predation, hemorrhage, and probable bacterial infection. 3 maps.

1977. Morbidity and mortality of marine mammals - Bering Sea. In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 161-188. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder, Colo.

(Author was assisted by Robert A. Dieterich and Larry Shults.) From 107 carcasses found along the coast in the Bristol Bay and Bering Strait regions in 1976, plus 236 others examined during research cruises in southeast Bering Sea, and plus 361 others examined during earlier investigations, it is estimated that about 6% of Bering Sea marine mammals have some grossly evident pathological condition -- mostly abcessed wounds (majority of those necropsied had died of gunshot wounds), mycotic skin infections, tumors, and liver disease. Dead and dying marine mammals are deposited at the rate of about .05/km/yr on shore of the eastern Bering Sea, except in areas close to major hunting areas and major hauling out sites, where rate is 10 times greater. Species found were walrus, harbor and ringed seals, sea otter, beluga, minke, and gray whales, and harbor porpoise. 5 tab., 30 ref.

1978. Belukha whale. P. 132-137 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

In press. Industrial utilization of marine mammals. Science in Alaska, Proc. 29th Alaska Sci. Conf., Fairbanks, Alaska, August 15-17, 1978, 12 p.

During the recent era of protection and management of Alaskan marine mammals, which followed an era of severe over-exploitation, most stocks have come back strongly, some to the point where their renewed impact on commercial fisheries is causing some dissatisfaction. Former (and potentially future) uses by industry of Alaskan marine mammals are considered. Multiple use management - including subsistence, industrial, and non-consumptive uses - seems a feasible and desirable goal for the future.

Fay, Francis H., Howard M. Feder, and Samuel W. Stoker.
1977. An estimation of the impact of the Pacific walrus population on its food resources in the Bering Sea. Final rep. to U.S. Mar. Mammal Comm., for contracts MM4AC-006, MM5AC-024, 38 p. (Avail. Natl. Tech. Inf. Serv., Springfield, Va., as PB 273-505.)

Assessments of population of benthic invertebrates over 5 years at 176 oceanographic stations in eastern Bering and Chukchi Seas and examination of stomachs from 107 walruses taken by Eskimos in the region from St. Lawrence Island to Bering Strait indicate that walrus population is at or near carrying capacity of its environment (walruses removing about 11 x 10^6 tons of benthos per year from the Bering and Chukchi shelf) and that any perturbation of benthos will have a significant adverse effect on walrus population. 9 tab., 5 fig., 17 ref.

Fay, Francis H., and G. Carleton Ray.
In press. Reproductive behavior of the Pacific walrus in relation to population structure. Science in Alaska, Proc. 29th Alaska Sci. Conf., Fairbanks, Alaska, August 15-17, 1978. [Abstr. only.]

From authors' abstract: "Histological evidence now indicates that the mating season is from January to April. Hence, we have studied walrus behavior at that time and concurrently sampled the composition of the population. Our findings suggest that the population as a whole comprises about 35 percent immatures, 15 percent adult males, and 50 percent abult females; that is, the sex ratio of animals of breeding age appears to be at most 1:3. During the mating season, nearly all of the adult females and the largest males (bulls) congregate in two areas: north-central and southeastern Bering Sea. ...[Behavior during mating season is described, and characterized as resembling a lek or arena system, but with the arena being mobile.]... In any case, polygyny is strongly indicated and, as in other polygynous pinnipeds, is correlated with an unequal sex ratio of adults and with sexual dimorphism. These findings are of considerable significance to management of the walrus resource since they suggest that the productivity of the population is much higher than was predicted previously. Because the sex ratio at birth is 1:1, they suggest also that there is a substantial "surplus" of immature males that could be harvested without affecting the structure or productivity of the adult population. Present information on these two points is not conclusive; much additional information needs to be gathered. ... A full report is in preparation for the first volume of joint marine mammal studies under the US-USSR Marine Mammal Project, to be published in 1979."

Fay, Francis H., Larry M. Shults, and Robert A. Dieterich.
In press. Natural mortality of marine mammals in Alaskan waters. Science in Alaska, Proc. 29th Alaskan Sci. Conf., Fairbanks, Alaska, August 15-17, 1978. [Abstr. only.]

From authors' abstract: "We began an investigation of the causes and rates of occurrence of natural morbidity and mortality in Alaskan marine mammal populations in 1975, with initial emphasis on the Bering Sea and, later, on the Gulf of Alaska-Cook Inlet region. Data were obtained from carcasses cast ashore by the sea and from necropsy of samples drawn from

the living populations [about 500 specimens of pinnipeds so far]. ... About 10 percent of the carcasses were cetaceans, mainly gray whales (Eshrichtius robustus), and the most frequently identifiable cause of death in these was predation by killer whales (Orcinus orca). Most of the remainder were pinnipeds, especially walruses (Odobenus rosmarus) with a few sea otters (Enhydra lutris). The majority of the pinnipeds had died from gunshot wounds, but a significant proportion appeared to have died from natural causes, the most frequent of which were malnutrition (mainly in pups of the year), predation, parasitism, and infectious diseases. ... In general, the rate of occurrence of beached carcasses was about 1/2.5 to 3 km in areas downstream from major subsistence hunting sites and about 1/25 to 30 km in other areas. ... Preliminarily, the mortality rate of walruses from natural causes appears to be about 2 percent per year."

Fedoseev, G.A.

1962. O sostoyanii zaposov i raspredelenii Tikhookeanskogo morzha (The status of reserves and distribution of Pacific walruses). Zool. Zh. 16(7):1083-1089. In Russian. (Transl. by U.S. Nav. Oceanogr. Off., Washington, D.C., 1969, Trans. 432, 11 p.)

During aerial surveys in late September to late October 1960, walruses were counted. The total number of walruses is estimated at about 50,000. Most spend summer and autumn in the Wrangel and Herald Island areas. Apparently only males inhabit shores of Chukchi Peninsula and Alaska at this time of year.

1966. Aerovizual'nye nablyudeniya za morskimi mlekopitayushchimi v Beringovom i Chukotskom moryakh (Aerial observations on marine mammals in the Bering and Chuckchee Seas). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 58:173-177. In Russian. (Transl. by Dep. Inter., Bur. Commer. Fish., Seattle, Wash., 1966, p. 98-102 in K.I. Panin (ed.), Soviet research on marine mammals of the Far East.)

Reports on flights totalling 114 hours, flown from 28 September to 17 December 1960, for the primary purpose of counting walrus. Author surveyed coastal waters around the Chukchi Peninsula from the mouth of the Kolyma River (in the E. Siberian Sea) to Kresta Bay in the Gulf of Anadyr, plus the waters surrounding Wrangel and Herald Islands. The totals of animals counted were: 41,000 walrus (with an estimated population of 46,000 for the area surveyed); 498 baleen whales; 516 belugas, and 207 seals. Seven bowhead whales were identified in and near Longa Strait. Concentrations of gray whales were seen along the coast from Bering Strait north to Serdtse-Kamen' Cape. Water around gray whales was often brown-rust color and gulls were present. Humpbacks and fin whales were identified in Kresta Bay and Gulf of Anadyr. Belugas were seen north of Lat. 69°N, and a group of 500 passed north of Wrangel Island. Bearded and ringed seals were identified up to 35 miles north of Wrangel Island as well as coastally. Three polar bears were seen on Wrangel Island. Concentrations of birds are noted.

1973. Morfo-ecologicheskaya kharakteristika populyatsiy krylatki i obosnovanie ee zapasov (Morphological-ecological characteristics of ribbon seal populations and factors affecting the conservation of usable stocks). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 86:158-177. In Russian. (Transl. by Dep. Environ. [Can.], Fish. Mar. Serv., Ste. Anne de Bellevue, Quebec, 1973, Transl. Ser. 3365, 50 p.)

Data collected from sealing vessels in 1970-1971 in the Okhotsk Sea are added to previously gathered data from the Bering Sea. Comparison of the 2 seal populations is made. Information on length, weight, craniological features, growth rates, maturity and reproductive activity is given. Population in the Bering Sea is quoted as 80,000-90,000 in 1964, and 60,000 in 1969. The need to cease hunting of ribbon seal is emphasized.

1975. Ecotypes of the ringed seal (Pusa hispida Schreber, 1977) and their reproductive capabilities. In K. Ronald and A.W. Mansfield (eds.), Biology of the seal. Rapp. P.-v. Réun. Cons. int. Explor. Mer 169:156-160.

From 1960 to 1970 author studied ringed seals from 3 areas: Okhotsk Sea, southwestern Chuckchee [sic] Sea, and Bering Strait. Author states (p. 156): "There is strong evidence that 2 ecotypes exist: the ringed seals of the drift-ice (seals from the Okhotsk Sea and the South Chuckchee Sea) and the ringed seals of the fast ice of bays and gulf (Bering Sea seals)." In his conclusions, he states: "Ringed seals inhabiting the drift ice have smaller body and skull dimensions, a relatively higher rate of growth and accordingly an earlier sexual maturity than ringed seals of the fast ice. Reproductive capability of the populations was estimated at 21%, and from calculations of the natural mortality of the different age groups, the increase of the populations did not exceed 4-5% at the best." 2 tab., 1 fig., 16 ref.

1976. Summary of the results and main aspects of investigations of seals of Phocidae family and walrus of the northern Pacific Ocean. Paper presented at Meeting of the Project on Marine Mammals within the framework of the US-USSR Agreement on Environmental Protection, January 1976, Moscow, 12 p. (Avail. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle WA 98115.)

A summary of investigations carried on between 1930 and 1975. Discusses breeding, reproduction and age structure of populations. Suggests possible topics of collaboration for American and Soviet scientists.

Fedoseev, G.A., and Y.I. Nazarenko.

1970. K vaprosy o vnutividovoi strukture kolchatoi nerpy arktiki (On intraspecific structure of ringed seals in the Arctic). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 71:301-307. In Russian. (Transl. by Fish. Res. Board Can., Mar. Ecol. Lab., Dartmouth, N.S., 1972, Transl. Ser. 2411, 11 p.)

Age analysis, growth patterns and morphological features were compared between ringed seals (Pusa hispida hispida) of the Bering and Barents Seas. It appears that there is only one subspecies, but the 2 populations represent local ecological races.

Fedoseev, G.A., and G.G. Shmakova.
1976. Some results of investigations of spatial structure of ribbon and larga seals of the Bering Sea. Paper presented at Meeting of the Project on Marine Mammals within the framework of the the US-USSR Agreement on Environmental Protection, January 1976, Moscow, 9 p. (Avail. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.)

The skulls of 196 ribbon seals and 123 larga seals were analyzed. Apparently the larga seals form 3 local populations: Karaginsky, Anadyr and the eastern Bering. The ribbon seal forms 2 reproductive groups in the eastern and western Bering Sea, which are weakly differentiated morphologically.

Fiscus, Clifford H.
1972a. Fur seal, Callorhinus ursinus, and northern (Steller) sea lion, Eumetopias jubatus, observations south of the western Aleutian Islands. P. 109-123 in Marine Mammal Biological Laboratory, Fur seal investigations, 1971, unpubl. manuscr. [132 p.], Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.

Reports by pelagic sealers of the 1890's indicated possible abundance of northern fur seals south of the western Aleutian Islands. Recent surveys of this area being lacking, author joined the R/V George B. Kelez (on salmon research cruise) as observer, from 16 May to 9 June 1970. His tabulated observations total 40 fur seal observations, 87 sea lion observations. Survey area: Long. 74°W-74°E, Lat. 48°N-52°N. Seals have been sighted in this area from May through October, being probably more numerous in spring and early summer than other seasons. Sea lions are more abundant here than seals. Sea lion censuses of the western Aleutians are reviewed. Seal observations during the passage from Amutka Pass to Cape Flattery, Washington (11-18 June) are included (total of 57 fur seal observations). Behavior of Dall porpoise, sea lion, fur seals, and marine birds vis à vis salmon-nets and salmon is discussed. Among these animals, sea lion is probably principal predator of salmon in this area. Stomach contents of fur seals collected during such cruises 1963-1970 are tabulated (11 animals). 2 tab., 2 fig., 7 ref.

1972b. Northern fur seal - Steller's sea bear. P. 5-11 in A. Seed (ed.), Seals, sea lions and walruses in eastern North Pacific and arctic waters, Pacific Search Books, Seattle, Wash.

A thorough, general discussion of the fur seal, briefly describing its distribution in the North Pacific, physical characteristics, life span, population, reproductive biology, schedule of coming and going from the Pribilof Islands, migration, wintering range of different age and sex classes, feeding habits, history of exploitation and current management of the Pribilof Islands herd. 2 photos.

1978. Northern fur seal. P. 152-159 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

Fiscus, C.H., and G.A. Baines.
1966. Food and feeding behavior of Steller and California sea lions. J. Mammal. 47:195-200.

The stomachs of 34 Steller sea lions and 7 California sea lions were collected during 1958-1963. Food species found in Steller sea lions suggest nearshore, shallow water feeding, whereas food species taken by California sea lions are found in both shallow and deep waters. Feeding occurs in either small or large groups. Size of the aggregate is apparently dependent upon the presence of schooling fish or squid. In either size group, feeding takes place within 15 miles of the rookery. Steller sea lions were sighted in the northern Gulf of Alaska in April and May, 1958 and 1960. They were also seen in the Bering Sea between the Pribilof Islands and the Aleutian Islands during July and August 1963.

Fiscus, Clifford H., Gary A. Baines, and Hiroshi Kajimura.
1965. Pelagic fur seal investigations, Alaska, 1963. U.S. Fish Wildl. Serv., Spec. Sci. Rep. Fish. 489, 33 p.

From July to September fur seals were collected in the Bering Sea, largely north of Unalaska Island. Most animals appeared to travel 60 to 90 miles from the Pribilof Islands to feed. Age and sex of seals collected were determined. Postpartum females predominated in the collection. Food and feeding habits were investigated. Squids were the major food, followed by several fish species including 3 commercial species -- salmon, pollock and herring.

Fiscus, Clifford H., Gary A. Baines, and Ford Wilke
1964. Pelagic fur seal investigations, Alaska waters, 1962. U.S. Fish. Wildl. Serv., Spec. Sci. Rep. Fish. 475, 59 p.

Fifth year of pelagic research as required by the Interim Convention on Conservation of North Pacific fur seals was conducted in Unimak Pass and adjacent Bering Sea. Includes data on food, distribution, and abundance as well as reproductive biology.

Fiscus, C.H., H.W. Braham, R.W. Mercer, R.D. Everitt, B.D. Krogman, P.D. McGuire, C.E. Peterson, R.M. Sonntag, and D.E. Withrow.
1976. Seasonal distribution and relative abundance of marine mammals in the Gulf of Alaska. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Northwest & Alaska Fish. Cent., Mar. Mammal Div., Seattle, Wash., Processed Rep., 238 p.

A comprehensive report of marine mammal sightings in the northeast Gulf of Alaska and the Kodiak shelf area from July 1975 to October 1976. Sightings are recorded and mapped by month for each of 19 species. Population estimates offered. 5 tab., 7 fig., 142 ref., + app.'s with 17 tab., 119 fig., 57 ref.

Fiscus, Clifford H., and Hiroshi Kajimura.
1965. Pelagic fur seal investigations, 1964. U.S. Fish Wildl. Serv., Spec. Sci. Rep. Fish. 522, 47 p.

Pelagic research was conducted off California, Oregon, and Washington in April, and in the Bering Sea from 4 July to 8 September. Number of seals encountered, age and sex composition of catch, distribution in Bering Sea, tagged seals caught, and barnacle and algae infestation, were compared with previous studies in the same areas. Stomach contents were examined.

1967. Pelagic fur seal investigations, 1965. U.S. Fish Wildl. Serv., Spec. Sci. Rep. Fish. 537, 42 p.

Pelagic research was conducted off Washington and California (April to June). Locations of seal concentrations are given. Seals were most abundant from 30 to 40 miles offshore. Of 387 females taken, 44% were pregnant. Moroteuthis robusta (a squid) is reported for the first time as fur seal food.

Fiscus, Clifford H., and Willman M. Marquette.
1975. National Marine Fisheries Service field studies relating to the bowhead whale harvest in Alaska, 1974. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Northwest Fish. Cent., Seattle, Wash., Processed Rep., 23 p.

Eight Alaskan communities engaged in bowhead whaling in 1974: Kaktovik (Barter Island), Nuiqsut, Barrow, Wainwright, Point Hope, Kivalina, Gambell and Savoonga. Twenty whales were taken, 3 were killed but lost, and 28 were wounded but lost. In the spring, 3 or 4 "waves" of bowheads usually pass Pt. Hope and Barrow, from early April to June. Observations of ringed seal, walrus, belukha whale, and birds, are included. 7 tab., 7 photos, 1 map.

Fiscus, Clifford H., Karl Niggol, and Ford Wilke.
1961. Pelagic fur seal investigations - California to British Columbia, 1961. U.S. Fish Wildl. Serv., Bur. Commer. Fish., Mar. Mammal Biol. Lab., Seattle, Wash., Processed Rep., 87 p.

The fourth successive year of pelagic research, under the Interim Convention on conservation of North Pacific Fur Seals, was conducted from November 1960 through April 1961. Of 1,352 seals collected, 77 were male, and 29 bore tags. British Columbia waters yielded more yearlings than other areas. Well-developed corpora lutea in ovaries without implantation scars in uterine horns suggest that about 14% of mature females miss pregnancy through failure of egg implantation. Ages were determined. One seal carried twins. Stomach contents are reported. One killer whale was collected.

Fiscus, C.H., D.W. Rice, and A.M. Johnson.
1969. New records of Mesoplodon steinegeri and Ziphius cavirostris from Alaska. J. Mammal. 50(1):127.

Skull was collected from a floating carcass of Mesoplodon steinegeri (True) sighted west of Cape Edgecombe, Alaska (57°04'N, 146°32'W), on 20 May 1968. This is within the known range of the cetacean. On 7 June 1968, a skull of Ziphius cavirostris (Cuvier) was found in Trident Bay, Akun Island, in the eastern Aleutians (54°09'N, 165°33'W). There are 4 other reports of the species from the Aleutians.

Fiscus, Clifford H., and Victor B. Scheffer.
1962. Variety of food remains in stomachs of Steller sea lions. Unpubl. manuscr., 13 p. U.S. Fish Wildl. Serv., Bur. Commer. Fish., Mar. Mammal Biol. Lab., Seattle, Wash.

Paper summarizes findings of 11 investigators. A total of 131 sea lion stomachs were examined between 1901 and 1961, from Ano Nuevo Island, central California, northward to the northwest tip of Vancouver Island, B.C.; from Alaska; and from the Commander Islands (western Bering Sea). Approximately 40 kinds of food organisms are tabulated. Stated purpose of the paper is to show the wide variety of invertebrates and fishes eaten by sea lions.

Foote, Don Charles.
1965. Exploration and resource utilization in northwestern arctic Alaska before 1855. Ph.D. Thesis, McGill University, Montreal, Quebec, Can., 400 p.

From author's abstract: "...carefully outlines the visits of Europeans and Americans to the region before 1855. ...Knowledge of the Eskimo seasonal activities, diet, caloric needs and the nutritional value of certain animals and plants is combined with the estimated number of people and their dogs to construct a theoretical kill of wildlife." Wildlife utilized includes white whale, bowhead whale, harbor seal, ringed seal, bearded seal, walrus and polar bear. Appendices: A - Population statistics; B- Caloric content of animals; C- Caloric needs of Eskimo groups. 235 ref.

Fraker, Mark A., David E. Sergeant, and Wyb Hoek.
1978. Bowhead and white whales in the southern Beaufort Sea. Department of Fisheries and the Environment [Can.], Beaufort Sea Project, 9860 West Saanich Road, P.O. Box 6000, Sidney, B.C., V8L 4B2 [Can.], Beaufort Sea Tech. Rep. #4, 114 p.

Includes information on reproduction, food/feeding, utilization, and migration of both species', and on age/growth of white whales. Possible effects on them of oil and gas exploration are assessed. The bulk of the report concerns white [=beluga] whales in the Mackenzie estuary. White whales migrate from the Bering Sea to the southeast Beaufort Sea/Amundsen Gulf region in May and early June using far offshore leads between Barrow and Banks Island. There is a move westward into the Mackenzie estuary through the nearshore lead, usually in late June. Most congregate there from late June to early August. Many others spend the summer around Amundsen Gulf, still others in Eskimo Lakes. Westward migration to winter grounds occurs late August and September. Maximum abundance in the Mackenzie estuary at any one time (not including dark-colored juveniles) is at least 4,000 and may be as high as 6,000. Bowhead whales probably follow the same general path into the Beaufort Sea, by way of

far offshore leads in May and June, returning in August and September by a coastal route. "Most bowheads spend late spring and summer in Amundsen Gulf." History of bowhead exploitation is described; Marquette's (1977) estimate of total numbers (1000 to 3000) is cited. Effects of current oil and gas exploration (north of the Mackenzie estuary) which could disturb, impede or halt whales' movements include traffic of boats, barges, hovercraft and aircraft; artificial islands and borrow operations. An offshore oil blowout, though unlikely, is probably the most serious potential threat to whales. Direct impacts of oil (e.g., through contact or ingestion) and indirect impacts (e.g., on whales' foods) are considered according to seasonal whereabouts of whales. 21 maps, 10 pl., 3 fig., 11 tab., 7 app., 63 ref.

Frame, G.W.
1971. Occurrence of polar bears in the Chukchi and Beaufort Seas, summer 1969. J. Mammal. 53(1):187-189.

Thirteen bears were seen during a cruise on an icebreaker 13 days in July-August of 1969. Three of the 13 bears had young of the year. All were seen in seas 65-95% ice covered; none were found on the heavy ice. Walrus were seen in the Chukchi but none in the Beaufort, presumably because the deeper water in the Beaufort makes clam beds inaccessible.

Fujino, K.
1954. On the body proportions of the fin whales (Balaenoptera physalus L.) caught in the northern Pacific Ocean I: a preliminary report. Sci. Rep. Whales Res. Inst. 9:121-163.

Twenty-two body measurements of whales caught from 1941 to 1952 off Kamchatka are compared with those of whales caught off the outer Aleutian Islands. No differences were recognized between the 2 stocks.

1960. Immunogenetic and marking approaches to identifying subpopulations of the North Pacific whales. Sci. Rep. Whales. Res. Inst. 15:85-142.

Blood groups and marking are discussed with regard to subspecies of fin whales (Balaenoptera physalus). Also mentions blood types of Stenella coeruleo-albus [sic], Berardius bairdii, Physeter catodon, Balaenoptera edeni, Balaenoptera musculus, Megaptera nodosa.

Gaskin, D.E., P.W. Arnold, and B.A. Blair.
1974. Phocaena phocaena. Mammal. Species 42:1-8.

A compilation of general information on the harbor porpoise; characteristics, form, distribution, fossil records, function, ontogeny, ecology and behavior are discussed. Migration patterns are unknown.

Geist, O.W., J.L. Buckley, and R.H. Manville.
1960. Alaskan records of the narwhal. J. Mammal. 41:250-523.

Three observations reported extend the southern range of the narwhal. (1) In 1957, a specimen was found on Kiwalik Bay (Lat. 66°N). (2) Also in 1957, a narwhal was found at the mouth of the Caribou River (56°N), and (3) a specimen was found at Wainwright, Alaska.

Gentry, Roger L.
1977. The influence of female feeding patterns on otariid social systems. Abstr. only. in Proc. (abstracts), Second Conf. Biol. Mar. Mammals, San Diego, California, 12-15 December 1977, p. 28. (Avail. from author, Northwest and Alaska Fish. Cent.. Natl. Mar. Mammal Lab., Natl. Mar. Fish. Serv.. NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.)

Feeding patterns of northern fur seals and Steller sea lions are presented to support the contention that absence of social bonding between individuals was an important precondition for development of the extreme forms of polygyny seen in extant otariids.

Gentry, Roger L., and David E. Withrow.
1978. Steller sea lion. P. 166-171 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

Geraci, J.R., and T.G. Smith.
1976. Direct and indirect effects of oil on ringed seals (Phoca hispida) of the Beaufort Sea. J. Fish. Res. Board Can. 33:1976-1984.

Authors' abstract: "Ninety-six ringed seals (Phoca hispida) were taken from nets at Brown's Harbour, Northwest Territories in the fall of 1974. Comparison with two other net samples from 1971 and 1972 revealed a lower proportion of young-of-the-year and a lower mean weight of seals in all age-classes. Six seals immersed in Norman Wells crude oil for 24 h at the field netting site suffered only transient eye problems and minor kidney and possibly liver lesions; no permanent damage was observed. Three seals transported to the University of Guelph all died within 71 min after oil was introduced into their pool. Hematologic and blood chemical studies indicate that death was caused by oil superimposed on the stress of captivity. Six, 3-4 wk-old wild whitecoat harp seal (P. groenlandica) pups at the Magdalen Islands, Quebec, were coated with crude oil. No significant differences in core body temperatures were noted and no deleterious effects were observed. Five captive ringed seals at Guelph were subjected to a cumulative dosage of Normal Wells crude oil fed with their fish food. High dosage (75 ml) and low dosage (25 ml) of crude oil were also fed to two groups of six harp seal pups. No significant lesions or behavioral changes were noted. These experiments were of an acute nature and reflect the effects of a brief contact with oil only. Effects of longer contact as would probably be the case in an offshore oil well blowout situation are discussed. Possible effects of large-scale offshore oil fields are also considered." 3 fig., 33 ref.

Gill, C.D., and S.E. Hughes.
1971. A sei whale, Balaenoptera borealis, feeding on Pacific saury, Cololabis saira. Calif. Fish. Game 57(3):218-219.

The capture of a sei whale in August of 1969, 85 miles west of Point Reyes, California, is reported. Feeding behavior prior to capture is described. The stomach, filled to capacity, contained 227kg of sauries.

Gill, T.
1873. The ribbon seal of Alaska. Am. Nat. 7:178-179.

The distribution of Phoca fasciata is described as northern Alaskan waters. Pelt coloration and dentition noted.

Gilmore, Raymond M.
1956. Rare right whale visits California. Pac. Discovery 9(4):20-25.

Description of whale sighted from Scripps Institution of Oceanography, La Jolla, and followed by boat. Discussion of the history of the species. Data from California shore whalers show only a handful of right whales taken. One animal was killed in April 1924 off the Farallon Islands. Map shows "original" distribution in North Pacific and Bering Sea. Mentions Kodiak Gyre and Kodiak Ground. 3 photos + drawings.

1959. The California gray whale. U.S. Dep. Inter., U.S. Fish Wildl. Serv., Sect. Mar. Mammal Res., Seattle, Wash., Processed Rep., 70 p.

A report on the gray whale, offering explicit migration patterns, distribution, behavior studies, shore censuses 1952-1957, and data from aerial surveys 1952-1957. Counts of gray whales passing San Diego indicate a population size of 2,900 in 1952-3, and 4,400 in 1956-7. The bulk of the whales spend the summer (June to September) in the northwestern Bering Sea and adjacent Chukchi Sea. A small number are believed to summer 75-100 miles north of Humboldt Bay, California.

1978a. Right whale. P. 62-69 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

1978b. Some news and views of the gray whale, 1977; Part 1. Migration into and out of the Bering Sea. Whalewatcher 12(1):4-8.

Author reviews development of his thoughts on the migration route of gray whales. In light of recent observations, present proposed route includes coastal passage between Vancouver Island and the Bering Sea and is close to shore all the way from Baja California and into Bristol Bay. (Route proposed earlier had been offshore.) 3 illus. (charts), 10 ref.

Gogan, Peter J.

1977. A review of the population ecology of the northern elephant seal (Mirounga angustirostris). U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Northwest and Alaska Fish. Cent., Mar. Mammal Div., Seattle, Wash., Processed Rep., 68 p.

Contents: Introduction; annual cycle; food habits; reproduction; mortality; parasites and diseases; the population; critical habitats; conclusions; literature cited. Oceanic sightings from 8 publications (most recent from 1969) are tabulated, and include two from Chatham Strait, Alaska, one in May, one in September. 10 tab, 6 fig, 75 ref.

Gol'tsev, V.N.

1968. Dinamika beregovykh lizhbishch morzha v svayazi s ego raspredeleniem i chislennost'yu (Dynamics of coastal walrus rookeries in connection with distribution and numbers of walrus). Tr. Vses. Nauchno-issled. Inst. Morsk. Inst. Rybn. Khoz. Okeanogr. (VNIRO) 68 (Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 62):205-215. In Russian. (Transl. by Israel Program Sci. Transl. 1971, p. 201-212 in V.A. Arsen'ev and K.I. Panin (eds.), Pinnipeds of the North Pacific, avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 70-54020.)

Studies were carried out mainly in 1960, 1962, 1964 and 1965, on 4 Soviet coastal rookeries. Rookeries are divided into 2 types: stable and temporary. Coastal rookeries tend to form when there are no ice floes. The number of rookeries, and walrus on them, is determined by ice conditions. Visual counts in 1964 indicated 47,000-51,000 animals in the rookeries. 2 tab., 3 fig., 17 ref.

1972. Raspredelenie i uchet chislennosti tikhookeanskogo morzha osen'yu 1970 goda (Distribution and assessment of numbers of the Pacific walrus in the autumn of 1970). P. 25-28 in Tezisy Dokladov Pyatogo Vsesoyuznogo Soveshchaniya po Izucheniyu Morskikh Mlekopitayushchikh (Abstracts of Papers 5th All-Union Conf. Studies Mar. Mammals) 19-21 Sept. 1972, Makhachkala. Makhachkala: Minist. Rybn. Khoz. SSSR, Ikhtiol. Kom. VNIRO, KaspNIRKh, Akad. Nauk SSSR, Zool. Inst., Inst. Evol. Morfol. Ekol. Zhivotn. im. A.N. Severtsova, Inst. Biol. Razvit. (Transl. by F.H. and B.A. Fay, Univ. Alaska, Fairbanks, 1974, 3 p.)

Records presence of walrus on former hauling grounds and sightings in areas further south than usual. This has been interpreted to indicate an increase in the walrus population. Some data were collected in mid-September to mid-October 1970 by aerial surveys of the Chukotsk Peninsula and the western Chukchi. On 18 October, 41,700 walruses were photographed on 3 hauling grounds. The total population is estimated at 101,000 and the annual recruitment at 5,000 to 6,000 animals.

1976. Aerouchet tikhookeanskogo morzha v sovetskom sektore osen'yu 1975 (Aerial surveys of Pacific walrus in the Soviet sector during Fall, 1975). Processed rep., Magadan Branch, TINRO [Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr.], 18 p. + 4 fig. In Russian. (Transl. by John J. Burns, Alaska Dep. Fish Game, Fairbanks, Alaska, 26 p.)

[This paper was presented at a meeting of the Project on Marine Mammals within the framework of the US-USSR Agreement on Environmental Protection, 18-25 January 1977, La Jolla, Calif.] During the period from 17 Sept. through 16 Oct., aerial surveys were conducted in the Soviet sector (west of the International Dateline) of the Bering and Chukchi Seas. These flights were coordinated with flights by U.S. scientists in the U.S. sector [see Estes and Gilbert, 1978]. Seven coastal hauling grounds in the Bering Sea (including two newly discovered hauling grounds on Nuneangan Island and Ioann Bogoslov Island), and two in the Chukchi Sea were found. Ice hauling grounds were found in the western part of the Chukchi Sea rather near shore. A total of 128,000-130,000 walruses were found in the Soviet sector - 96,900 on hauling grounds and the remainder on ice hauling grounds or in the water. Growth of population and expansion of range southward were found.

Gol'tsev, V.N., V.N. Popov, and M.V. Yurakhno.
1975. O lokal'nosti stad beringovomorskoi largi (On the localization of Bering largas). P. 100-102 in G.B. Agarkov and I.V. Smelova (eds.), Morskie mlekopitayushchie (Marine mammals), Part 1, Materials from 6th All-Union Conf. [on Studies of Mar. Mammals], Kiev, [1-3] October 1975. Min. Rybn. Khoz. SSSR, Ikhtiol. Kom., VNIRO, Akad. Nauk SSSR, Inst. Evol. Morfol. Ekol. Zhivotn., Inst. Biol. Razvit., Zool. Inst., Akad. Nauk USSR, Inst. Zool. In Russian. (Transl. by F.H. Fay, Inst. Mar. Sci., Univ. Alaska, Fairbanks, AK 99701, 3 p.)

Over the years 1966-1973 material was obtained from 794 largas from two populations. One resides along the eastern coast of Kamchatka and is concentrated in spring on the ice of Karaga Gulf. The other is located in a more northern part of the sea, from the Koryak coast to Bering Strait with the center in the Gulf of Anadyr. Specimens from the two localities were compared as to size and weight, degree of sexual dimorphism, skull measurements, and helminth infestation. The differences found "allow us to regard both populations of larga as being discrete. The border that separates them may be considered conditionally as Cape Olyutorskii. Interchange of individuals between populations probably exists, but it is very insignificant."

Gudkov, V.M.
1962. O svyazyakh v raspredelenii zooplanktona, morskikh ptits i usatykh kitov (Relationship between the distribution of zooplankton, seabirds and baleen whales). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 58:298-313. In Russian. (Transl. by Dep. Nav. Oceanogr. Off., Washington, D.C., 1974, 16 p.)

During a 1955 expedition to the Bering Sea there was found a high coincidence of birds, baleen whales and plankton in space and time. Stomach contents of birds and whales were analyzed. Among the principal food forms were members of Calanoida. All concentrations of shearwaters coincided with the presence of whales, but only half of the albatross, kittiwake, least auklet, forktailed petrel, and tufted puffin concentrations were associated with whale sightings. Presumably both whales and marine birds are exploiting the same food source, explaining their similar distribution patterns.

Guiguet, C.J., and G.C. Pike.
1965. First specimen record of the grey grampus or Risso's dolphin, Grampus griseus (Cuvier), from British Columbia. Murrelet 46(1):16.

In May 1964 a grampus was shot on the west side of Stuart Island, British Columbia. The stomach contained nematodes and squid beaks. No measurements are available. Also, sightings made from a Canadian weathership stationed at 50°N, 145°W are given as follows: July 1958 (1), October 1959 (6), August 1960 (5), and September 1960 (4).

Gulland, J.A.
1974. Distribution and abundance of whales in relation to basic productivity. P. 27-52 in W.E. Schevill (ed.), The whale problem, Harvard Univ. Press, Cambridge, Mass.

Headings are: Distribution, primary and secondary production; general distribution of sperm whales; relative abundance of sperm whales in different areas; distribution of baleen whales; relative distribution and abundance of different species of rorquals; magnitude of production and potential harvest; rational utilization and conservation. Figure maps world distribution of zooplankton. Detailed distributions of whales and zooplankton are not discussed. 5 tab., 2 fig.

Haley, Delphine (ed.).
1978a. Marine mammals of eastern North Pacific and Arctic waters. Pacific Search Press, Seattle, Wash., 256 p.

Volume contains current information on abundance, distribution, natural history, research methods, human impacts, and other salient facets of over 40 species. The editor and 21 marine mammal researchers contributed chapters. [Relevant chapters are cited individually and indexed by species, but because of pressure of time they are annotated only very briefly or not at all. See Burns, DeLong, Fay, Fiscus, Gentry & Withrow, Gilmore, Haley, Kenyon, Leatherwood & Reeves, Lentfer, Marquette, Mate, Mitchell, Newby, Newman, Reilly, Rice, Scheffer, and Wolman.] 125 photos including 16 color pl., 30 distribution maps, 12 drawings, 142 ref.

1978b. Steller sea cow. P. 236-241 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

Hall, E.R., and J.W. Bee.
1954. Occurrence of the harbor porpoise at Pt. Barrow, Alaska. J. Mammal. 35(1):122-123.

An adult Phocaena vomerina (Gill) was caught in August 1952 in a net at 71°21'N, 156°35'W. Two weeks later an immature animal was found in the same net. The stomach of the adult contained whitefish (Leucichthys). Measurements are given.

Hall, John D., Craig S. Harrison, Jay Nelson, and Andrew Taber.
1977. The migration of California gray whales into the Bering Sea. Abstr. only, in Proc. (abstracts), Second Conf. Biol. Mar. Mammals, San Diego, California, 12-15 December 1977, p. 8. (Avail. from first author, P.O. Box 58, Kasilof, AK 99610.)

Aerial surveys in springs of 1976 and 1977 revealed that gray whales migrated along the coast from Cape St. Elias to Unimak Pass, normally passing within 400m of shore (none seen passing more than 5km from shore). Shore observations from Cape Sarichef on Unimak Pass indicated that about 9,000 gray whales (including very few cow/calf pairs) entered the Bering Sea by this route between 7 April and 26 May 1977.

Hall, John D., and Michael F. Tillman.
1977. A survey of cetaceans of Prince William Sound and adjacent vicinity -- their numbers and seasonal movements. In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 681-708. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder, Colo.

Aerial and vessel surveys were used. In 1976 cetaceans sighted totalled: 974 Dall porpoises* (peak in August); 185 harbor porpoises* (peak in May); 500 Pacific white-sided porpoises (Lagenorhynchus obliquidens) (sighted in October just outside Montague Strait); 167 killer whales* (peaks in August and April); 23 gray whales (spring and fall); 106 humpback whales* (estimated summer population 40-60); 23 fin whales (May to July); 52 minke whales (summer and fall); one belukha; 5 sei whales. Last two are casual visitors only. Beaked whales (Mesoplodon, Ziphius, and Berardius) may occasionally appear. Cetaceans appeared to be less numerous in winter, but winter weather conditions made confident assessment impossible. *Sightings of these animals are individually graphed by month. 1 tab., 14 fig., 8 ref.

Hanna, G.D.
1920. Mammals of the St. Matthew Islands, Bering Sea. J. Mammal. 1(3):118-122.

Survey in July 1916 yielded cetacean skeletal remains (bowhead, humpback, sulphur-bottom, killer and Baird's whales), sightings of hair seals (Phoca sp.), and walrus. Polar bears were formerly abundant, but their occurrence is believed to have ceased in the 1890's. Fur seals were common up to within 8 miles of St. Matthew, in June of 1916.

1923. Rare mammals of the Pribilof Islands, Alaska. J. Mammal. 4(4):209-215.

Records rare sightings and strandings of sperm whale, beaked whales (Berardius bairdii), killer whales, harbor porpoises, walruses, bearded seals and sea otters.

Harry, G.Y., Jr.
1971. Recent development in research and management of northern fur seals (Callorhinus ursinus). Science in Alaska, Proc. 22nd Alaska Sci. Conf., College, August 17-19, 1971, p. 138. [Abstr. only.]

Between 1889 and 1909 no effective international conservation agreement existed. The North Pacific Fur Seal Convention signed in 1911 was terminated by Japan in 1941. In 1957, Japan, the USSR, the USA and Canada signed the Interim Convention on Conservation of North Pacific Fur Seals. Between 1956 and 1963, female seals were harvested on the Pribilof Islands, the herd having grown beyond the level of maximum sustainable yield. However, estimates of pups born and of the female survival rate later appeared to have been inflated. At present the fur seal population level is similar to that in the early 1930's, but rapid increase is not occurring now as then. If permanent adverse changes have occurred in the marine environment, expectations of fur seal yield must be revised.

Hart, F. Gordon.
1977. Observations on the spring migration of gray whales near Pachena Point, British Columbia. Murrelet 58(2):40-43.

Literature is reviewed. Observations were made during winter and spring of 1974-75 from Pachena Pt. (southwest shore of Vancouver Island). Frequency distribution of group sizes observed in northward migration is tabulated. Several pairs passed which appeared to be mother-calf pairs in late March. Breaching, "spy-hopping", "loafing", rolling together showing heads and flukes, possible feeding, and sexual behavior (5,6, and 14 April, with apparent copulation 14 April). 1 tab., 1 fig., 6 ref.

Hatler, D.G.
1971. A Canadian specimen of Risso's dolphin (Grampus griseus). Can. Field-Nat. 85(2):188-189.

Specimen washed ashore on Vargas Island, near Vancouver Island (49°10'N, 125°58'W) on 17 April 1970. Measurements taken. Stomach contained eel grass only.

Hatler, D.G., and J.D. Darling.
1974. Recent observations of the gray whale in British Columbia. Can. Field-Nat. 88:449-459.

Observations from Vancouver Island were made from 1965-1973, except for 1967. There is a peak in migrant animals in April, and the data suggest the whales hug the Vancouver coast for both the north and south migration. The authors note that the whales have been observed feeding along the coast during all parts of the year. It is not clear whether these are resident animals.

Heizer, Robert F.
1968. A bibliography of aboriginal whaling. J. Soc. Bibliogr. Nat. Hist. 4(7):344-362.

Consists of a short introduction, index, and 233 references. Introduction discusses genuine aboriginal whaling. "At least three radically different techniques of killing large whales are known to have been practiced among primitive peoples." 1) Whales are impounded in small bays and inlets and shot with darts tipped with pathogenic bacilli. Whales die within a few days and are brought to shore. Infected area is cut out and used to grow more bacilli. (Scandinavian coast, especially Norway.) 2) Whale is harpooned from boat carrying crew and harpooner. Harpoon line has inflated buoys or wooden drags attached it. Whale is harpooned again when it resurfaces, or may be lanced if possible. (Europeans and Americans in the 17th-19th centuries, Eskimos and Northwest Indians, aborigines of Siberia.) 3) From a two-man baidarka paddled with double-ended paddle, a lance with a stone tip coated with aconite is thrown into the whale. Whales dies and is retrieved if and when it washes in to shore. (Aborigines of coast of northeastern Asia, Aleutian Is., Kodiak Is.)

Heyland, J.D., and Keith Hay.
1976. An attack by a polar bear on a juvenile beluga. Arctic 29(1):56-57.

On 26 July 1974, in Cunningham Inlet, Somerset Is., in the Canadian arctic, a young female beluga whale was found stranded. Deep but well-healed scars were found on her back. It was determined that the scars were made by a polar bear's claw. Other reports of predation by polar bears on beluga whales are reviewed. 2 fig., 6 ref.

Houck, W.J.
1961. Notes on the Pacific striped porpoise. J. Mammal. 42(1):107.

Records a dead porpoise (Lagenorhynchus obliquidens) found at 41°03'N, 124°09'W, in September 1958. The stomach and esophagus were completely filled with sauries (Cololabis saria [sic]). A large, incompletely swallowed scad (Decapterus polyaspis) is thought to have caused death by choking the porpoise.

Howell, A. Brazier, and Laurence M. Huey.
1930. Food of the gray and other whales. J. Mammal. 11(3):321-322.

A male gray whale of 39 feet was caught near Crescent City, California, and was landed at Trinidad, California, 21 July 1926. Euphausia pacifica were found in its mouth and among baleen. Euphausiids and "small mackerel-like fish some 10 inches in length" are reported from fin and humpback stomachs from California.

Huey, Laurence M.
1952. An Alaskan record of the narwhal. J. Mammal. 33(4):496.

One animal was collected in summer 1928 near mouth of Colville River. Skull and tusk were sent to San Diego Society of Natural History. Alaskan records are almost nonexistent.

Ichihara, Tadayoshi.
1958. Gray whale observed in the Bering Sea. Sci. Rep. Whales Res. Inst. 13:201-206.

Gray whales seen near St. Lawrence Island, one gray whale seen in Unimak Pass in 1957, and 3 groups found west of St. Lawrence Island in 1955 suggest a migration route through the eastern Aleutian passes, as Kellogg proposed in 1929, rather than around to the west of the Commander Islands as Gilmore proposed in 1955. 2 fig.

Ichihara, Tadayoshi, and Kazumoto Yoshida.
1972. Diving depth of northern fur seals in the feeding time. Sci. Rep. Whales Res. Inst. 24:145-148.

In the western Japan sea, May 1970, fur seal dives were observed from shipboard using echo-sounder. Dives of 100 meters or more are reported. 3 fig.

Imler, R.H., and H.R. Sarber.
1947. Harbor seals and sea lions in Alaska. U.S. Fish Wildl. Serv., Spec. Sci. Rep. 28, 22 p.

This 1945-46 study was an attempt to determine the extent of damage to the fishing industry by seals and sea lions. Stomach analyses of some 400 seals indicated that in the Copper River district eulachon (smelt) was the primary food source, and in SE Alaska, gadids (cods) were common prey. During July-August, shrimp appeared to be a preferred prey. From 15 sea lions, it appeared that pollack was the predominant food; commercially important fish comprised 14% of the stomach contents. Harbor seals are common throughout Gulf and SE Alaska, and especially abundant near large stream mouths. Copper River population is estimated at 6,000. Sea lions inhabit entire coast of SE Alaska with total abundance of 3,000. West of Seward their abundance increases.

International Commission on Whaling.
1974. Japan - Progress report on whale research June 1972 to May 1973. Rep. Int. Comm. Whaling 24:214-219.

Japanese government chartered catcher boat for 50 days beginning in February in sub-tropical North Pacific. Three whaling companies operated sighting cruises in Antarctic. Marking: Antarctic - 131 whales marked, 6 recovered; North Pacific - 146 marked, 24 recovered. (All tabulated in appendices.) The latter marks were recovered from area 35°-50°N, 145°E-163°W. These whales were 16 sei, 5 fin, and 3 sperm, and had been marked in area 15°-55°N, 143°E-160°W.

International Commission on Whaling, Scientific Committee.
1971. Report of the special meeting on sperm whale biology and stock assessments. Rep. Int. Comm. Whaling 21:40-50.

The groupings adopted in 1963, which delineated 3 breeding stocks in the North Pacific, were not modified. Information on age, growth, reproduction, ecology and fishing effort offered. Rate of natural mortality for N. Pacific sperm whales is about 6%. Methods of stock assessments were detailed, but no population estimates given.

1976. Japan - Progress report on whale research - June 1974 to May 1975 [SC/27/Progress Report 2]. P. 416-424 in Rep. and papers of the Scientific Committee of the Commission - 1975. Int. Comm. Whaling. [By the prior procedure, the material in this volume would have been published with the 26th report of the International Commission on Whaling.]

Included are sighting reports of prohibited whales by catcher boats in North Pacific, 1974: 131 blue whales and 13 humpback whales were reported in the eastern Gulf of Alaska; 5 right whales were reported elsewhere in the N. Pacific. 7 tab., 2 fig.

1977. Japan - Progress report on whale research - June 1975 to May 1976. Rep. Int. Whaling Comm. 27:88-91.

Included are sighting records of prohibited whales by catch boats in North Pacific 1975: 70 blue whales and 5 humpbacks were thus sighted in the eastern Gulf of Alaska. Four right whales are reported from the northwestern Pacific. 7 tab., 2 fig.

Ivanova, E.I.

1961. O tikhookeanskoi kosatke (Orcinus orca L.) [The Pacific killer whale (Orcinus orca L.)]. Tr. Inst. Morfol. Zhivotnykh Akad. Nauk SSSR 34:205-215. In Russian, with Engl. abstr.

From July to August 1951-1956, 19 female and 14 male killer whales were studied. Sexual dimorphism was apparent in fin size and number of teeth. Of 21 stomachs examined, 11 were empty and 10 contained fish and squid residues.

Ivashin, M.V., and A.A. Rovnin.

1967. Some results of the Soviet whale marking in the waters of the North Pacific. Norsk Hvalfangst-tid. 56(6):123-135.

Soviet whale marking in the North Pacific began in 1954. Marking was first done only in the northwestern Pacific but has expanded to cover the entire North Pacific (and Bering Sea) north of Lat. 40°N. Soviets have marked a total of 1,452 whales: 8 blue, 51 fin, 72 humpback, 43 sei, 29 gray, 20 Pacific right, 6 killer, and 1,223 sperm whales. Speed of movement of sperm, sei and humpback whales is discussed. A total of 66 marks have been recovered, from sperm, sei, humpback, fin and blue whales. Positions of marking and recovery are tabulated and charted. One fin whale marked in the Sea of Okhotsk was recaptured in the Gulf of Alaska. Local populations of sperm whales mingle north of Lat. 50°N. 4 fig., 6 tab., + appendix.

Ivashin et al. 1972. See Moiseev.

Jeffries, Steven J., Tim J. Moore, and Murray L. Johnson.
1977. The relationship of behavior to censusing of harbor seals (P. v. richardi). Abstr. only, in Proc. (abstracts), Second Conf. Biol. Mar. Mammals, San Diego,, California, 12-15 December, 1977, p. 70. (Avail. from authors, Puget Sound Mus. Nat. Hist., Univ. Puget Sound, Tacoma, WA 98416.)

Aerial and surface counts have shown close correlation between haul-out patterns and daily tidal cycles. Group bottom-resting and other behavioral factors affect census accuracy.

Jellison, W.L.
1953. A beaked whale, Mesoplodon sp., from the Pribilofs. J. Mammal. 34(2):249-251.

Reports a stranding of a species of Mesoplodon on St. Paul Island on 7 September 1951.

Johnson, A.M.
1975. The status of northern fur seal populations. In K. Ronald and A.W. Mansfield (eds.), Biology of the seal. Rapp. P.-v. Réun. Cons. int. Explor. Mer 169:263-266.

Estimates of abundance in 1970-1971 are: Pribilof Islands - 1.2 million; Commander Islands - 265,000; Robben Island - 165,000; Kuril Islands - 15,000; San Miguel Island - under 1000. Methods of estimating yearly pup populations are discussed. 1 fig., 2 tab.

Johnson, Brian W.
1977. The effect of human disturbance on a population of harbor seals. In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 422-432. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder, Colo.

[This report is Appendix 1 of Pitcher & Calkins (1977), found on pages 189-225, but the two have been accidentally separated.] Daily observations were made from May to September 1976 in large rookery area on southwest end of Tugidak Island. Major disturbances, and even minor ones, cause separations of mothers and pups which often result in starvation and death of the pup. Major natural disturbances: eagle landing nearby, massive rockslide. It is estimated that human disturbances such as hikers, all-terrain vehicles, and especially low-flying aircraft, caused the deaths of more than 10% of the pups born on Tugidak Island. 1 tab., 3 ref.

Johnson, Murray L., and Gordon D. Alcorn.
1962. The return of the sea otter. Outdoor Calif. 23(2):4-5.

Recounts history of exploitation since 1741. Present population is estimated as high as 40,000. Distribution includes Amchitka Island, Delarof, Andreanof and Fox island groups, Alaska Peninsula, Kodiak archipelago, and Kenai Peninsula to Cape St. Elias in Alaska, and the California coast.

Johnson, Murray L., Clifford H. Fiscus, Burton T. Ostenson, and Myron L. Barbour.
1966. Marine mammals. P. 877-923 in Norman J. Wilimovsky (ed.), Environment of the Cape Thompson region, Alaska. U.S. Atomic Energy Commission. (Avail. Natl. Tech. Inf. Serv., Springfield, Virginia.)

Authors studied at Point Hope and Kivalina, Alaska, August-September 1959 and November 1960-June 1961. Data were obtained on the following animals: 2,028 ringed seals, 208 bearded seals, 7 ribbon seals, 3 fur seals, 3 harbor seals, 2 walrus, 5 beluga whales, 3 bowhead whales and 3 polar bears. Quoting from authors' abstract: "The ringed seal is present in abundance from November through June. Pups are born in late March. Mating occurs in April and May; pregnancy rate 86.7%. Food is principally fish in the winter and invertebrates in the spring, and many species of both are used. The bearded seal is present in numbers only in June. Pups are born in late April and are completely molted. Food is principally invertebrates of many species. All marine mammals are migratory, and most of the animals used by the Eskimos are absent in the ice-free months."

Johnson, M.L., K.W. Kenyon, and C. Brosseau.
1967. Notes on a captive sea otter Enhydra lutris. Zool. Soc. London, Int. Zoo Yearb. 7:208-209.

Discusses knowledge of sea otter biology and history of attempts to keep in captivity; reports on behavior, size and food of a male sea otter brought to Tacoma, Washington, from Amchitka Island (Aleutian Islands) by Karl W. Kenyon in November 1965.

Jones, Robert D., Jr.
1963. An overland migration of fur seals. J. Mammal. 44(1):122.

A small number of fur seals have been observed in winter crossing the tip of the Alaska Peninsula from the Bering Sea to the Pacific Ocean. Author reports personal observations on 20 November 1960 (one young female) and 8 March 1962 (one old female). Distance of crossing was 3 miles. Other observers report crossings of 8 miles.

Jonsgård, Age.
1968a. A note on the attacking behaviour of the killer whale (Orcinus orca). Norsk Hvalfangst-Tid. 57(4):84-85.

A school of killer whales was observed feeding on a just dead bottlenosed whale Hyperoodon ampullatus while two of the killer whales kept the prey afloat. When the killer whales sounded the prey also sank. It was brought to the surface again later by the killer whales, which continued to feed as before. Another incident is related wherein killer whales attacked live bottlenosed whales tethered to a small whaling vessel. With reference to killer whale predation on a minke whale, author notes that "at any rate, in Norwegian coastal waters adult [minke] females, contrary to adult males, often migrate into inshore waters during their feeding migration in the summer, also visiting small bays." 4 ref.

1968b. Another note on the attacking behaviour of killer whale (Orcinus orca). Norsk Hvalfangst-Tidende 6:175-176.

It appears that under special circumstances, killer whales will attack and bite off the flippers of larger whales. It does not seem likely that they are able to kill species' like minke or bottlenose whales. These larger whales may dive deeply to escape when under attack.

Jonsgård, A., and P.B. Lyshoel.
1970. A contribution to the knowledge of the biology of the killer whale Orcinus orca (1). Nytt Mag. Zool. 18:41-48.

Data were collected on 1,413 killer whales caught in the northeastern North Atlantic 1938-1967. The distribution of killer whales in these waters is dependent on the herring distribution. Stomachs examined contained squid, large herring and marine mammals. Information on size at birth, sexual maturity and physical maturity is given.

Jonsgård, Age, and Per Oynes.
1952. Om bottlenosen (Hyperoodon rostratus) og spekkhoggeren (Orcinus orca). Fauna no. 1, Naturen 1:1-17. In Norwegian. (Transl. of p. 11-16, concerning killer whale, by O.A. Mathisen, 1967, Coll. Fish., Univ. Wash., Seattle, Wash., 4 p.)

Physical characteristics, behavior, and capture patterns of the killer whale are discussed. In the northeast Atlantic, killer whales are attracted to the herring schools, and tend to frequent shallow areas on the continental shelf. The primary food source is reportedly fish, although marine mammals are often taken.

Jurasz, Charles M., and Virginia Jurasz.
1977. Censusing of humpback whales, Megaptera novaeangliae, by body characteristics. Abstr. only, in Proc. (abstracts), Second Conf. Biol. Mar. Mammals, San Diego, California, 12-15 December 1977, p. 54. (Avail. from authors, Sea Search, P.O. Box 93, Auke Bay, AK 99821.)

Fluke and dorsal fin characteristics permit visual identification of individual whales, and were used to discriminate transient and non-transient animals in Glacier Bay, Alaska.

Kajimura, Hiroshi, Michael Perez, Robert Lander, W. Bruce McAlister, Michael Bigg, Ian MacAskie, and Graham Ellis.
1977. The distribution and food of northern fur seals in the northeastern Pacific and Bering Sea. Abstr. only, in Proc. (abstracts), Second Conf. Biol. Mar. Mammals, San Diego, California, 12-15 December 1977, p. 9. (Avail. from senior author, Northwest and Alaska Fish. Cent., Natl. Mar. Mammal Lab., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.)

Data collected by U.S. and Canadian scientists from 1958 to 1974 (as research for the North Pacific Fur Seal Commission) have been jointly analyzed to provide a comprehensive summary on fur seal food and distribution.

Kasuya, Toshio.
1971. Consideration of distribution and migration of toothed whales off the Pacific coast of Japan based upon aerial sighting record. Sci. Rep. Whales Res. Inst. 23:37-60.

Reports sightings recorded during aerial surveys 1959-1970 of whales (sperm, Baird's beaked, killer, pilot, and false killer), dolphins (Risso's, common, bottlenosed, northern right-whale, and striped) --and finless porpoise. Fifteen aerial photos show these species in the water.

Kawakami, Takehiko, and Tadayoshi Ichihara.
1958. Japanese whale marking in the North Pacific in 1956 and 1957. Norsk Hvalfangst-Tid. 47(6):285-291.

Japanese whale marking in the North Pacific was begun in 1949. In 1956 and 1957, 310 whales were marked. Over 34 of these were fin and humpback whales; the remainder were sperm, sei and blue whales. Marked whales recaptured in 1956 and 1957 by Japanese whalers were: 30 sperm, 2 sei, 18 fin and 3 blue whales. Six recaptures by Soviet whalers are also mentioned. Three humpback whales marked off Unalaska Island (central Aleutian Islands) in 1956 were recaptured in 1958 off Okinawa Island. All results are charted. 3 tab., 1 fig.

Kawamura, Akito.
1975. Whale distribution in Bering Sea and northern North Pacific in the summer of 1974: Results of a visual sighting study aboard the University of Hokkaido training vessel OSHORO MARU. Bull. Japan. Soc. Fish. Oceanogr. 25:119-128.

Cruise between 9 June and 29 July afforded 1,766 observation miles, and yielded the following cetacean sightings: 416 Phocoenoides (mostly dalli, but including 93 truei); 23 killer whales; 25 minke whales; 8 fin whales; 2 humpback whales, 2 large unidentified, 2 small unidentified. Figures show locations of sightings. (Dall porpoise was the only species sighted enough to provide really useful data.) Density of Dall porpoises was judged to be higher in the Amchitka Pass area and over the shelf slope in the Bering Sea than in the North Pacific, Bristol Bay and northern coasts of Aleutian Islands. Various evidence indicates that the center of distribution for large whales is over the shelf proper rather than along the shelf edge in the Bering Sea; none were seen in what used to be a good fin whale ground just south of the Aleutian Islands. Conspicuously absent was any sighting of sperm whales. Distributions of Dall's porpoises and pinnipeds often coincide, and are different from that of large whales. Killer whale sightings were to the north of Unalaska Island in the vicinity of Pribilof Canyon.

Kellogg, Remington.
1931. Whaling statistics for the Pacific coast of North America. J. Mammal. 12(1):73-77.

Catch data by species and location from 1919-1929 are tabulated. Species are blue, finback, humpback, sei, gray and sperm whales, plus "miscellaneous" whales including beluga, bowhead, right, bottlenose, sharp-headed finback (minke), Bryde's whales. Locations decribed include: Alaska, British Columbia, Washington and California. Discussion mentions migration, numbers of whales, biology (length and maturity) and conservation.

Kenyon, Karl W.

1952. Diving depths of the Steller sea lion and Alaska fur seal. J. Mammal. 33(2):245-246.

At the mouth of Sitka Sound, off Crawfish Inlet, and off Kruzof Island, all within 40 miles of Sitka, Herman Kitka, halibut fisherman, has been bothered by sea lions. Kitka's observations indicate that sea lions do not go below 100 fathoms; fur seals do not usually go below 30 fathoms.

1960a. Aerial surveys of marine mammals in the Bering Sea; 23 February to 2 March 1960 and 25-28 April 1960. Unpubl. manuscr., 39 p. U.S. Dep. Inter., U.S. Fish Wildl. Serv., Bur. Sport Fish. Wildl., Sand Point Nav. Air Stn., Seattle 15, Wash.

Includes copious material about walrus sightings (cf. Kenyon 1960b), plus short sections on whales sighted (1 bowhead, 27 beluga), and seals sighted (ringed seal, ribbon seal, bearded seal) with comments on other records of their occurrence. No polar bears were seen in 1960, but tracks were seen in 1958 between King Island and Little Diomede. Estimated populations were: (1) 30,000 to 60,000 bearded seals in the Bering Sea, (2) 70,000 to 100,000 walrus.

1960b. Aerial survey of walruses in northern Bering Sea, 23 February to 2 March 1960. Unpubl. manuscr., 23 p. U.S. Dep. Inter., U.S. Fish Wildl. Serv., Bur. Sport Fish. Wildl., Sand Point Nav. Air Stn., Seattle 15, Wash.

Survey included: Nunivak Island, St. Matthew Island, St. Lawrence Island and return to Bethel; area south of Nunivak; area south and southwest of St. Lawrence Island to St. Matthew Island; Kuskokwim Bay, northern Bristol Bay, and trip to Cold Bay. Greatest concentrations of walrus were seen on "close" and "very close pack ice", often near islands. Population computation methods are explained. Population computations are tabulated in 6 divisions of area, yielding grand total estimates ranging from 78,000 to 170,000, depending on the percentage presumed to have been overlooked. The majority were found south and southwest of St. Lawrence Island. On 1 March, group sizes were noted: 65% of groups were more than 10; 35% ten or less. Charts show track of survey, locations and numbers of walrus seen, and approximate position of the ice edge. Birth was evidenced 1 March. 3 charts, 10 photos.

1960c. A ringed seal from the Pribilof Islands, Alaska. J. Mammal. 41(4):520-521.

A dead Pusa hispida was found on St. Paul Island in August 1951. It constitutes the first record from the Pribilofs.

1960d. The Pacific walrus. Oryx 5(6):332-340.

Eskimo hunting of walrus on St. Lawrence, Little Diomede, Round and Walrus Islands in 1958 is discussed. Walruses are killed for food and boat coverings, but the real economic motive for hunting is provided by ivory sales. Estimated annual take is 1,000 for the American side and 5,000 for the Soviet side. Females with calves are preferred kills because their ivory is easier to carve, their meat more tender, and their skin preferable as a boat cover. Of all walruses killed, at least half are lost.

1961a. Cuvier beaked whales stranded in the Aleutian Islands. J. Mammal. 42(1):71-76.

Two carcasses of Ziphius cavirostris found on Amchitka Island, apparently shot by rifle. Measurements, dentition, stomach contents and other biological data are reported. 2 tab., 1 fig., 2 pl., 9 ref.

1961b. Sleep...on the deep. Pac. Discovery 14(3):22-24.

Fur seals sleep very soundly at sea with 3 flippers above water forming a "jug handle". In choppy water they trail the hind flippers. Sea otters invariably sleep on their backs, in coastal waters. Pups sleep on the mother's chest. Six excellent photos illustrate.

1962a. History of the Steller sea lion at the Pribilof Islands, Alaska. J. Mammal. 43(1):68-75.

Author's abstract: "In 1786 the Pribilof Islands probably supported a sea lion population considerably in excess of 15,000 animals. These bred on 2 rookeries on St. George Island, one on St. Paul Island, and one on Walrus Island. A few may have bred also on Sea Lion Rock. The Walrus Island colony disappeared in 1827; between 1867 and 1914 both St. George rookeries were exterminated, and the St. Paul rookery was reduced to less than 150 animals. A measure of protection was given the sea lion in 1914. By 1960, the population had increased to 5,700-6,700 adults. The only breeding ground today on the Pribilofs is on Walrus Island, where about 3,000 young were born in 1960. Newborn pups were last seen on St. Paul Island in 1957. All extinct rookery sites are now regularly used as hauling grounds. Otter Island, never a breeding ground, is a regular winter hauling ground. Unregulated exploitation and harassment by man probably played an important role in the reduction of the Pribilof sea lion herd and the shifts in rookery locations. The failure of the Pribilof population to approach its aboriginal size and to reoccupy old breeding grounds during a 40-year period of moderate exploitation is unexplained. Unknown ecological factors are suggested as a contributing cause." 3 tab., 1 fig.,1 photo.

1962b. Notes on phocid seals at Little Diomede Island, Alaska. J. Wildl. Manage. 26(4):380-387.

Information was gathered during the spring of 1958 (11 May to 14 June) on the hunting and biology of ringed, bearded, ribbon and harbor [=larga?] seals. Most of the article concerns ringed and bearded seals, which are taken by the Eskimos of Ignaluk Village to supplement the kill of walrus, their primary subsistence species. Hunting efficiency, reproductive data (a few reproductive tracts were examined), behavior, body size, hauling out, movements and pelage are included, along with various information gained from resident Eskimos. Stomach contents were examined from 14 ringed seals and 17 bearded seals. Dominant food of ringed seals was shrimp; that of bearded seals was rock crabs and clams. 2 photos, 6 tab.

1965. Aerial survey of sea otters and other marine mammals, Alaska Peninsula and Aleutian Islands; 19 April to 9 May 1965. Unpubl. manuscr. P. 1-52 in K.W. Kenyon and J.G. King, Aerial survey of sea otters, other marine mammals and birds, Alaska Peninsula and Aleutian Islands, 19 April to 9 May 1965. U.S. Dep. Inter., U.S. Fish Wildl. Serv., Bur. Sport Fish. Wildl., Seattle, Wash.

Tabulates numbers and distribution of sea otters and (secondarily) sea lions and harbor seals. Survey area was: the length of the Aleutian chain and eastward along the north side of the Alaska Peninsula to Port Moller. Total counts in entire area were: sea otters - 12,687; sea lions - 63,933; harbor seals - 4,868. Total population of otters in survey area is estimated at about 17,000. Harbor seals may number twice the actual count. Present counts are compared with counts made in 1959 and/or 1962. Otters ranged several miles offshore into the shallow waters of Bristol Bay north of Unimak Island and the Alaska Peninsula east to Port Moller. Also mentioned are walrus, killer whale, and minke whale. 24 charts, 5 photos.

1972. Aerial surveys of marine mammals in the Bering Sea, 6-16 April 1972. Unpubl. manuscr., 79 p. U.S. Dep. Inter., U.S. Bur. Sport Fish. Wildl., Mar. Mammal Substation, Nav. Support Activity, Bldg. 192, Seattle, Wash.

Between 7 and 16 April 1972 flights were made over Bering Sea ice from Bering Strait to the Alaskan Peninsula and from Alaskan to Strait to the Alaskan Peninsula and from Alaskan to Siberian coastal waters. Sea otter (8), walrus (9,300), larga seal (79), ringed seal (29), ribbon seal (6), bearded seal (221), bowhead whale (1), and beluga whale (33) were observed in a 1-mile wide survey track of approximately 4,280 nautical miles in length. Two areas of abundance of walrus were observed: (1) north and south of the west end of St. Lawrence Island and (2) in central Bristol Bay. Abundance of Pacific walrus is estimated at 136,000 animals. (Statistical treatment yields estimate of 93,000 - 178,000 animals.) Survey methods, conditions and problems, and treatment of data are discussed. Field data given in Appendix 1, areas of high and low abundance in Appendix 2. 9 charts, 14 tab. (13 concerning walrus only). [Part of the above is adapted from summary and conclusions.]

1978a. Sea otter. P. 226-235 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

1978b. Walrus. P. 178-183 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

Kenyon, Karl W., and Dale W. Rice.
1961. Abundance and distribution of the Steller sea lion. J. Mammal. 42(2):223-234.

Authors' abstract in part: "Observations of the Steller sea lion, Eumetopias jubata, including hauling-out habits, seasonal movements, and aerial surveys in eastern Bering Sea from Bering Strait to and including the Aleutian Islands, are presented.... The total world population of this species, based on the present report and on previously published data, is estimated to be about a quarter of a million animals." 2 tab., 1 fig. (maps), 1 pl., 17 ref.

Kenyon, Karl W., and V.B. Scheffer.
1949. A long-snouted dolphin from the Washington coast. J. Mammal. 30(3):267-268.

A specimen was found dead in March 1948 near Westport, Washington. Although decayed, it appeared to be Stenella euphrosyne. This is the second report of this species in North America. Description and measurements are given.

1955. The seals, sea lions, and sea otter of the Pacific coast. U.S. Fish Wildl. Serv., Circ. 32 [revision of Wildl. Leafl. 344, 1953], 34 p.

A general guide to North Pacific pinnipeds and sea otter from Mexico to the Bering Sea. Brief descriptions of physical appearance, range and habits are given for each of 12 species.

Kenyon, Karl W., and Ford Wilke.
1953. Migration of the northern fur seal, Callorhinus ursinus. J. Mammal. 34(1):86-98.

Summary of existing knowledge. Three major breeding grounds are the Pribilof Islands, the Commander Islands, and Robben Island. Fur seals migrate southward in winter as far as 34°N Lat. along the California coast, and to about 39°N Lat. off Japan. Monthly summary of known occurrences of the northern fur seal at sea is given. Effects of water temperature, food and weather on distribution are evaluated. Arrival and departure schedule of the various age classes on Pribilof breeding grounds is summarized. Recoveries of tagged seals are summarized. A small fraction of Pribilof seals migrate to Japanese waters.

Kleinenberg, S.E., A.V. Yablokov, B.M. Bel'kovich, and M.N. Tarasevich.
1964. Belukha. Opyt monograficheskogo issledovaniya vida (Beluga. (Delphinapterus leucas). Investigation of the species). Izd. "Nauka", Moscow, 454 p. In Russian. (Transl. by Israel Program Sci. Transl., 1969, 376 p., avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 67-51345.)

A monograph on the beluga with comprehensive sections on morphology, distribution, classification, biological characteristics and whaling. The range of belugas is circumpolar, and they occur in the open sea as well as along the coast. From stomach analysis of whales taken in Soviet arctic seas, it appears the beluga has a broad feeding spectrum. Most of the organisms are shallow water forms. Food habits differ according to age and sex. The food items include arctic cod, capelin, salmonids, flat-fish, herring and crustacea. Explicit distribution patterns along Soviet coast shown. Belugas are found in the Bering Strait in February and May-June. No information offered for the Alaskan coast. It is believed that the beluga can winter in waters that freeze by remaining near large polynyas.

Klinkhart, Edward.
1966. The beluga whale in Alaska. Alaska Dep. Fish Game, Fed. Aid Wildl. Restoration Proj. Rep., Vol. 7, 11 p.

A general article discussing knowledge of biology of beluga whales, drawing upon about 25 sources, some from outside Alaska. Nearly all concentrations of belugas occur in shallow bays or estuaries of large rivers north of 40°N Lat. (They have been seen up to 60 miles upstream from the mouth of the Yukon River.) Bristol Bay population (which appears to be resident throughout the year) is estimated at 1,000-1,500. Population in Cook Inlet is estimated at 300-400. Populations which winter in the Bering Sea may be those which summer in the western Canadian arctic and eastern Siberian arctic. Contains sections on: general description, range and movements, abundance, population dynamics, food habits, parasites and predators, underwater sound, utilization, and future research and management. 53 ref.

1967. Birth of a harbor seal pup. J. Mammal 48(8):677.

On 15 June 1967 a harbor seal gave birth at Tugidak Island, Alaska (56°33'N, 155°20'W). One half-hour of observation, from 12 minutes before the birth until 18 minutes afterward, is reported.

1969. The harbor seal in Alaska. Alaska Dep. Fish Game, Wildl. Notebook Ser., 2 p.

Both ice- and non-ice-inhabiting harbor seals are described. Natural history is given. Annual harvest in northern Alaska is given as 4,000, and as 30,000 in southern Alaska. A bounty was in effect from 1927 to 1967.

Klumov, S.K.
1962. Gladkiye (Yaponskiye) kity Tikhogo Okeana (The right whales in the Pacific Ocean). Tr. Inst. Okeanol., 58:202-297. English summary.

Whaling and research vessels conducted observations from 1952 to 1957 on the distribution of right whales in the northwest Pacific. The results of this work describe two stocks. The Pacific stock is larger than the Okhotsk stock and growth of the Pacific stock is faster. It is possible that puberty comes when the animals are 14-15m long. Weaning takes place after 6-7 months. All data are preliminary. The weight of adult whales is more than 100 tons at a length of 16-17m. Analysis of food showed that right whales are stenophagous. The main food of right whales in the Northern Hemisphere is Calanoida.

Kooyman, Gerald L., Roger L. Gentry, and W. Bruce McAlister.
1976. Physiological impact of oil on pinnipeds. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Northwest and Alaska Fish Cent., Mar. Mammal Div., Seattle, Wash., Processed Rep., 23 p.

[This report was submitted as final report for Research Unit #71, Outer Continental Shelf Environmental Assessment Program, sponsored by U.S. Dep. Inter. and Bur. Land Manage.] Northern fur seals' major breeding grounds, the Pribilof Islands, are close to a major oil lease site, the St. George Basin. Objectives of this study were (A) to measure effects of oil fouling on northern fur seals in terms of: thermal conductance of pelts, and dive performance and metabolic rate of live animals, and (B) to compare thermal conductance of fur-bearing and non-fur-bearing pelts. From authors' summary: "The study has shown that small amounts of crude oil have large effects on thermal conductance of fur-bearing pelts, and no effect on nonfur-bearing pelts. [Oiled pelts tested were those of sea otter, bearded seal, Weddell seal, California sea lion, and northern fur seal.] In living animals [northern fur seals] light oiling of approximately 30% of the pelt surface area resulted in a 1.5-fold increase in metabolic rate while immersed in water of various temperatures. Furthermore, this effect lasted at least 2 weeks. Although normal diving was measured we did not obtain post-oiling data to show the effect of oil contact on dive performance. .... That death would inevitably follow such contact cannot be verified with the present effort; however, considering that (a) oiled animals have greatly increased maintenance costs, and (b) they are extremely reluctant to enter sea water (where their food is found), it is clear that the health of oiled animals would be in serious jeopardy." Light crude oils may be invisible on animals, so that attempts to wash fouled animals will be made ineffective. 5 tab., 3 fig., 16 ref.

Kooyman, G.L., R.L. Gentry, and D.L. Urquhart.
1976. Northern fur seal diving behavior: a new approach to its study. Science 193(4251):411-412.

Authors' abstract: "A new type of depth-time recorder was used to monitor behavior of fur seals at sea. During 608 hours, 2957 dives were recorded for four animals. The deepest dive was 190 meters, and the longest submersion was 5.6 minutes." 10 ref.

Kosygin, G.M.

1966a. Nekotorye materialy po pitaniyu lakhtaka v Beringovom more v vesenne-letnii period (Certain materials on the feeding of the bearded seal in the Bering Sea during the spring-summer period). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 58:153-157. In Russian. (Transl. by U.S. Dep. Inter., Bur. Commer. Fish., Seattle, Wash., 1966, p. 78-82 in K.I. Panin (ed.), Soviet research on marine mammals of the Far East.)

In spring-summer of 1963, 37 adult bearded seal stomachs were collected during sealing. (Figure shows distribution of 75 bearded seals killed from Gulf of Anadyr to northwest Bristol Bay by squares of approximately 1^{o} Long. x 1^{o} Lat.) Knowledge of distribution of benthic species and knowledge of bearded seal feeding is reviewed. Stomach contents examined are discussed and tabulated. Decapods, gastropods and polychaetes predominated. 9 ref.

1966b. Raspredelenie i nekotorye cherty biologii lastonogikh Beringova morya - vesenne-letnii period 1963 g. (Distribution and certain biological features of Bering Sea pinnipeds - the spring-summer season of 1963). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 58:117-124. In Russian. (Transl. by U.S. Dep. Inter., Bur. Commer. Fish., Seattle, Wash., 1966, p. 40-49 in K.I. Panin (ed.), Soviet research on marine mammals of the Far East.)

Describes distribution of ribbon, harbor (Phoca vitulina largha) and bearded seals as observed during sealing in March-June 1962 and 1963. Two figures summarize these findings. Area covered was from western Bristol Bay northwestward to Anadyr Bay. Observations are given relating to the schedule of pupping, shedding of lanugo, and molting for these 3 phocids. Ice conditions are described.

1966c. Raspredelenie lakhtaka v Beringovom more v vesennii period 1962-1964 gg. (The distribution of the bearded seal in the Bering Sea in the spring period of 1962-1964). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 58:125-128. In Russian. (Transl. by U.S. Dep. Inter., Bur. Commer. Fish., Seattle, Wash., 1966, p. 50-53 in K.I. Panin (ed.), Soviet research on marine mammals of the Far East.)

Information was gathered in the course of hunting cruises, March-June. "Accumulations" were found between St. Lawrence Island, southeast of St. Matthew Island, south of Nunivak Island, and in Anadyr Bay. Notes young animals found, in summer, in region of Karagin Island. Contains two references to ribbon seals. 1 fig.

1971. Pitaniye lakhtaka Erignathus barbatus nauticus (Pallas) v Beringovom more v vesenny-letniy period (Feeding of the bearded seal Erignathus barbatus nauticus (Pallas) in the Bering Sea during the spring-summer period). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 75:144-151. In Russian. (Transl. by Fish. Mar. Serv. [Can.], Ste. Anne de Bellevue, Quebec, Can., 1976, Transl. Ser. 3747, 14 p.)

From March to June 1963-1965, 565 stomachs were collected from bearded seals across the Bering Sea. Crustaceans comprised the bulk of the diet, with snow crabs, visored shrimp and Pandalus spp. figuring prominently. Gastropod mollusks and octopuses were important. Polychaetes were significant only in 1963. Fish appears to be important, but the species vary greatly. Young seals forage in the morning, while mature individuals do so in the afternoon. It appears that the seals eat more in May than in June. 2 tab., 3 fig., 36 ref.

1975. K raspredeleniyu i migratsiyam lastonogikh Beringova i Chukotskogo morei (On the distribution and migration of pinnipedia in the Bering and Okhotsk* Seas). [*"Okhotsk" is a mistranslation; it should read "Chukchi".] P. 115-117 in Papers of the All-Union Conference, Vladivostok, Oct. 1975 - Biologicheskie resursy morei dal'nego vostoka (Biological resources of the Far East seas). Ichthyol. Comm., Min. Fish. USSR, Pac. Ocean Res. Inst. Fish. Oceanogr. [TINRO]. In Russian. (Transl. avail. Natl. Mar. Fish. Serv., Off. Int. Fish., Lang. Serv. Branch, Washington, D.C., 2 p.)

In May and June ribbon seals, predominantly age 5 and older, concentrated 30 to 200 miles east and southeast of Cape Navarin. Harbor [larga?] seals were found in Karaginskii Gulf and in Kolyuchinskaia Bay. Walruses were observed from July to September in western Chukotsk Sea: In September 1973, male groups were found on drifting ice from Cape Serdtse-Kamen' to Cape Shmidt, while two groups including females and young were found south of Wrangel Island. In July 1973 on Rudder sand bar (Gulf of Anadyr), number of walrus was calculated at 5,000, and in September 1973 1500-2000 walrus were hauled out here plus many in the water. Ringed seals were seen by the thousands in June 1973 in Krest Bay (Gulf of Anadyr). Bearded seals were found in the western Bering Sea not only in the northern area and in Karaginskii Gulf as usual but also in Peter and Paul Bay (approx. 61°N). Passive migration on drifting ice by walrus and bearded seal in the Bering Sea is discussed.

Krogman, Bruce.
1977. Six bowhead whales in the arctic. Alaska 43(9):52-53.

Extraordinary photograph taken in early May 1977, 17 miles east of Pt. Barrow, shows whales engaged in reproductive activity, with penis of male extruded and highly visible.

Krogman, Bruce D., Howard W. Braham, Ronald M. Sonntag, and Richard G. Punsly.
1978. Seasonal distribution and abundance of the Pacific walrus (Odobenus rosmarus). Unpubl. manuscr., 47 p. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.

[Submitted as the Final Report for subcontract R7120804, Research Unit 14, Outer Continental Shelf Environmental Assessment Program, sponsored by the Dep. Inter., Bur. Land Manage.] Fay's (1957) historical analysis is summarized, describing distribution and abundance. Authors' research is described. [Remainder of annotation is derived from "conclusions".] "From October to December southward migration occurs from the Chukchi Sea through the Bering Strait and into the Bering Sea. Walrus pass across

the outer Kotzebue Basin as the ice front advances south. Much of the population reaches the St. Lawrence Island vicinity as early as late October and most of the population arrives by late December (Burns et al., 1977). During its southward movement through the Bering Strait large aggregations of walrus occur on hauling out areas in the Soviet sector.... During the December to March period a large proportion of the population is distributed in the St. Lawrence Island vicinity mainly to the west and more southwest and north than has occurred in the recent past. Results of this study are consistent with Burns et al. (1977) findings that few walrus occur in the Gulf of Anadyr, Norton Sound, or in the area north of Nunivak Island." Potential harm to this walrus population is assessed (with particular regard to oil lease site development): Walruses may be most vulnerable to harm through harm to the food supply on their winter range. Also, increased traffic of barges, tankers and aircraft may increase mortality of calves in the April-June period when the population is greatly confined in northward migration toward and through Bering Strait. 6 tab., 16 fig., 58 ref.

Krylov, V.I.

1962. Tempy razmnozheniya tikhookeanskogo morzha (Rate of reproduction of the Pacific walrus). Zool. Zhur. 41(1):116-120. In Russian. (Transl. by F.H. Fay, Univ. Alaska, College, Alaska, 12 p.)

Data were gathered from 600 walruses in July-October of 1960 in the Wrangel Island area. Pupping begins in April and ends in early June, copulation occurs immediately after birth. The greatest number of females bear young once every 3-4 years. Young individuals breed nearly twice as often as older females. The pregnancy rate is 18.8%. 2 tab.

1966. Vozrastnoi i polovoi sostav, plotnost' zaleganiya tikhookeanskogo morzha na l'dakh i beregovykh lezhbishchakh (The age and sex composition and the density of the Pacific walrus on ice and shore hauling-out places). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 58:97-103. In Russian. (Transl. by U.S. Dep. Inter., Bur. Commer. Fish., Seattle, Wash., 1966, p. 19-26 in K.I. Panin (ed.), Soviet research on marine mammals of the Far East.)

Observations were made from late July to September 1960. Walrus density on 92 ice grounds, mostly in the vicinity of Wrangel Island, was uneven and depended on the state of the ice surface as well as sex and age composition of animals. Three types of groups were found in this area: (1) sexually mature males with immature animals, (2) females with offspring, immature animals, and a few sexually mature males, and (3) old barren females and old males with a few young animals. Average density on ice grounds was 3.4 m^2 per animal. On 27 shore grounds, mostly at Rudder and Inchoun, walrus density tended to be lower when further from the water. Only males were found in these areas, and average density was 3.3 m^2 per animal. Highest density was found on hauling grounds occupied by females with young. Further detail on age of animals is given. 3 tab., 3 fig., 4 ref.

1968. O sovremennom sostoyanii zapasov tikhookeanskogo morzha i perspektivakh ikh ratsional'nogo ispol'zovaniya (Present condition of the Pacific walrus stocks and prospects of their rational exploitation). Tr. Vses. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (VNIRO) 68 (Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 62):189-204. In Russian. (Transl. by Israel Program Sci. Transl., 1971, p. 185-200 in V.A. Arsen'ev and K.I. Panin (eds.), Pinnipeds of the North Pacific, avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 70-54020.)

From aerial surveys of the western Chukchi Sea and Wrangel Island area in 1961, 30,000 walruses were counted. By 28 May, most had passed through the Bering Strait. Assuming over half the population travels on the western side of the Bering Strait, total population is estimated at 50,000. Of this, 70% are mature. Sex ratio is 1:1. Birth rate is calculated to be 11.2%. This is compensated for by a low natural mortality. It is suggested that the annual take be kept at 6%. 10 tab., 2 fig., 26 ref.

1971. O pitanii tikhookeanskogo morzha (Odobenus rosmarus divergens Ill.) [The feeding of the Pacific walrus (Odobenus rosmarus divergens Ill.)]. Tr. Atlant. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (AtlantNIRO) 39:110-116. In Russian. (Transl. by Fish. Mar. Serv. [Can.], Ste. Anne de Bellevue, P.Q. [Can.], 1974, p. 177-189 in K.K. Chapskii and (ed.) E.S. Mil'chenko, Research on marine mammals, Transl. Ser. 3185.)

Material was collected by author in 1960-1963 from the region of Wrangel Island. Out of 650 stomachs, 32 contained food in a state permitting determination of its composition. Contents of these 32 stomachs are tabulated. Mollusks predominated, followed by worms, ascidians, crustaceans, and fish. Existing literature is reviewed, including discussion of carnivorous walruses. Selective feeding related to sex and age of walruses was noted. 1 tab., 26 ref.

Kuzin, A.E.

1975. Sovremennoe sostoianie i perspektivy rosta populiatsii kotikov kuril'skikh ostrovov (Contemporary state and prospects for the growth of the Kuril Island fur seal population). Promysl. Ikhtiol. (7), Ref. Inf., Ser. 1, Min. Rybn. Khoz. SSSR: 15-16. In Russian. (Transl. avail. Natl. Mar. Fish. Serv., Off. Int. Fish., Lang. Serv. Branch, Washington, D.C., 2 p.)

Fur seals are found only on the Kamennye Lovushki and Srednego Islands, whereas in the 19th century they were found on nine islands in the Kuril archipelago. Total Kuril population was 24,482 (1,189 mature males, 12,277 females and 11,016 pups) in 1974. Three sites are mentioned as hauling-out grounds for both sea lions and fur seals. The two species get along well and numbers of fur seals continue to grow. Well-defined bachelor grounds are absent. Careful conservation is advised so that all former hauling grounds can be re-occupied.

Kuzin, A.E., M.K. Manimov, and A.S. Perlov.
1973. Dinamika chislennosti i perspektivy rosta stada morskikh kotikov na Kuril'skikh ostrovakh (Population dynamics and trends in the growth of a herd of fur seals on the Kurile Islands). Akad. Nauk SSSR, Ekologiya, No. 4:63-67. In Russian. (Transl. by Israel Program Sci. Transl., 1975, 7 p., avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 75-50064.)

Dramatic increases in Kurile Island fur seals have been observed since 1956. In the 1870's, 15,000 fur seals were counted on Raikoka Island, which was then the largest concentration in the Kurile Islands. No seals are found there now. However, they are found on several rocks in the Kamennye Lovushki and Srednev Islands, where counts totalled about 8,000 adults and 4,000 pups in 1971. From tagged seals caught, it appears that the majority of immigrants to the Kurile Islands come from the Pribilof Islands herd, though all of the major rookeries are represented. Increases are expected at various sites. At certain sites sea lions have decreased while fur seals have increased. Their hauling grounds are sometimes shared. 3 tab.

Kuz'min, A.A., and A.A. Berzin.
1975. Raspredelenie i sovremennoe sostoianie chislennosti gladkikh i serykh kotov v dal'nevostochnykh moriakh (Distribution and current numbers of right and gray whales in the far-east seas). P. 121-122 in Papers of the All-Union Conference, Oct. 1975, Vladivostok - Biologicheskie resursy morei dal'nego vostoka (Biological resources of the far-east seas). Ichthyol. Comm., Min. Fish. USSR, Pac. Ocean Res. Inst. Fish. Oceanogr. [TINRO]. In Russian. (Transl. avail. Natl. Mar. Fish. Serv., Off. Int. Fish., Lang. Serv. Branch, Washington, D.C., 2 p.)

Cruises were conducted August to October 1974. Greenland right whales in the Okhotsk Sea were concentrated near the Shantar Islands in areas of shore effluence. These whales apparently give birth from May to mid-July. Pacific right whales were found in an area of powerful rising movement of the water, northeastward from the Kashaverov shoal (40-45 whales). Only one gray whale was seen in the Okhotsk Sea (where four were seen in 1967). Two Greenland right whales were seen in the Bering Strait October 24, and three in the southern Chukchi Sea. From September to October gray whales were seen in the Bering and Chukchi Seas. Densest concentrations of gray whales were in the Gulfs of Anadyr and Mechigmen, in the widest opening of Laurentiya Gulf, and in the Chukchi Sea. Mass departure of gray whales from the Chukchi Sea occurs in mid-October. Total number of gray whales in Soviet waters is estimated to be 1,800-2,000. All whales were found in water with surface salinity of less than 30%. Gray whales confine themselves to shoal waters where wind agitation penetrates to the bottom, and where oxygenation is about 50%.

Lander. R.H.
1975. Method of determining natural mortality in the northern fur seal (Callorhinus ursinus) from known pups and kill by age and sex. J. Fish. Res. Board Can. 32(12)·2447-2452.

From known values of the number of northern fur seals born in a given year and the commercial kill of older animals by age and sex, a method is given for approximating natural mortality or survival (1) between times of birth and the first kill and (2) during the successive ages of kill. Applications of the present method to the 1961-1966 year classes of males indicate natural survival of 31-42% during ages 0-2 years and 84-89% annually during ages 2-5 years. [Author's abstract in part.]

Lander. R.H., and H. Kajimura.
In press. Status of northern fur seals [FAO ACMRR/MM/SC/34]. In Mammals in the seas, FAO [Food Agric. Org., U.N.] Fish. Ser. No. 5. Vol. 2, 50 p. [This volume will consist of documents of the Food Agric. Org. U.N., Advis. Comm. Mar. Resour. Res., Working Party on Mar. Mammals, from the Sci. Consultation on Mar. Mammals, Bergen, Norway. 31 Aug. - 9 Sep. 1976.]

Population on the Pribilof Islands given as 1,300,000. Birth, mortality and harvesting rates given with trends in abundance. Fur seals, considered opportunistic feeders, feed on fish over the continental shelf and squid beyond the shelf edge. The principal foods in Alaskan waters are capelin pollack. mackerel, sand lance and various squid (mostly deep water varieties).

Leatherwood, J.S., W.E. Evans, and D.W. Rice.
1972. The whales, dolphins, and porpoises of the eastern North Pacific -- a guide to their identification in the water. Nav. Undersea Res. and Develop. Cent., San Diego. Calif., 184 p.

Thirty cetaceans found in the North Pacific are grouped into 6 categories based on size and presence of dorsal fin. Members of each category are listed giving distinctive characteristics. (Drawings of surfacing and diving silhouettes are given for large whales.) Each species is then described in more detail (giving distribution, feeding), is shown at sea in photos, and is compared and contrasted with other animals with which it may be confused. Tags and marking methods currently in use are discussed and pictured. Sighting report forms are provided. 102 fig. + 6 app. fig., 11 ref.

Leatherwood. Stephen. and Randall Reeves.
1978. Porpoises and dolphins. P. 96-111 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle Wash.

[See Haley. 1978a.]

Lensink, Calvin J.
1960. Status and distribution of sea otters in Alaska. J. Mammal. 41(2):172-182.

A detailed report and review of census efforts from Cook Inlet to Amchitka Island from 1936 to 1957. "The present status of the otter is such that we can expect a rapid expansion in numbers from the Andreanof Islands eastward. West of the Andreanof Islands the habitat is limited and the population may already be near the carrying capacity. Here, sea otters are perhaps as abundant as they were before exploitation by the Soviets. On Amchitka Island the evidence indicates that a high population has resulted in increased mortality and a lowered reproductive rate." Estimates present Alaska population at 40,000. 1 fig. (map)

Lentfer, Jack W.
1970. Polar bear - sea ice relationships. P. 165-171 in Bears - their biology and management, publ. by Int. Union Conserv. Nat. Nat. Resour., Morges, Switz., New Series 23.

Sections: introduction; characteristics and movements of sea ice; polar bear distribution in relation to type of ice; harvest; denning related to ice movements and climate; discreteness of polar bear populations; influence of human activity. 2 fig., 12 ref.

1971. Polar bear movements as determined by mark and recovery. Science in Alaska. Proc. 22nd Alaska Sci. Conf., College, August 17-19, 1971, p. 133. [Abstr. only.]

Mark and recovery data from tagging of 283 bears as well as skull and body size, suggest that there are 2 discrete populations in Alaska. One population is to the west and one is to the north of Pt. Barrow. Bears sometimes appear to maintain their position relative to land, moving against ice drift.

1973. Occurrence of a northern fur seal near Wainwright, Alaska. Can. Field-Nat. 87(1):60.

A female northern fur seal was killed in early September 1969, 65km southwest of Wainwright, Alaska, at approximately 70°16'N, 161°42'W. Four other fur seal records from arctic coasts are reviewed: (1) Point Barrow, Alaska, in mid-August, (2) a Yukon Territory lake on 1 October, (3) near Letty Harbour, Northwest Territories, in mid-October, and (4) near Bathurst Inlet.

1974. Discreteness of Alaskan polar bear populations. Int. Congr. Game Biol. [Stockholm, Sweden, 1973] 11:323-329.

From author's abstract: "Recoveries of marked animals, differences in body and skull sizes, and differences in mercury levels thus indicate that bears to the west of Alaska and bears to the north of Alaska occur as partially discrete geographically isolated populations with only a limited amount of movement between them." 4 fig.

1975. Polar bear denning on drifting sea ice J. Mammal. 56(3):716-717.

Describes polar bear den found 168 km northwest of Pt. Barrow on drifting multiyear ice. Suggests that return of females to previously used dens minimizes interchange between populations· denning on drifting ice could increase the interchange. Bears may be forced to den on drift ice in the Barrow region due to human activity associated with oil development.

1978. Polar bear. P. 218-225 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

Lentfer J.W., J.R. Blum, S.N. Eide, and L.N. Miller.
1967. Report on 1966 bear studies. Alaska Dep. Fish Game, Div. Game, Fed. Aid Wildl. Restoration. Annu. Proj. Seg. Rep., Vol. 8, 54 p.

[Only polar bear section is annotated.] Data from 399 bears taken in sport kills from July 1965 to June 1966. are presented. Skull and hide measurements as well as ovary and testis samples were taken from the harvested bears. Aerial surveys were conducted in late April. Of the 1,090 bears seen by airplane hunting guides in 1966. 33% were young. Bears are more numerous in lead areas, particularly those covered by young ice and bordered by rough, broken ice. Correlation was noted between the number of seals and seal holes, and the number of bears. No population estimate given. Section includes 7 tab., 1 fig.

Loeb, Valerie Jean.
1972. A study of the distribution and feeding habits of the Dall porpoise in Monterey Bay, California. M.A. Thesis, San Jose State Coll., San Jose Calif., 62 p.

Previous literature on distribution, feeding, reproduction, and behavior is reviewed. Study period was from March 1970 through December 1971. Forty-six cruises were made for observation and collection of porpoises. Twenty-one animals were collected, and 10 beach-cast specimens were examined. Animals were found mostly in waters over the 100 fathom contour of the Monterey submarine canyon. Largest numbers and largest group sizes were found in January and July. Group size ranged from 2 to 50, most being 6 or less. Interactions with boats, breakaway stocking net, fin whale, and dolphins (Lagenorhynchus obliquidens) are described. Probable intraspecific agonistic behavior was observed. Variant coloration was noted. Food consisted mainly of hake, juvenile rockfish, and squid. Parturition occurred primarily in May and June. Sight records and length/weight of specimens are tabulated in appendices. 6 tab., 7 fig., 27 ref.

Loken, Marty.
1977. 1977 - last year for bowhead-whale hunting? Alaska 43(9):11.

Outlines development of bowhead controversy from federal and international viewpoints, quoting liberally from William Aron, U.S. Commissioner to the International Whaling Commission and director of NOAA's Office of Ecology and Environmental Conservation.

Lowry. Lloyd F., Kathryn J. Frost, and John J. Burns.

1977a. Final report of Beaufort Sea activities -- Trophic relationships among ice inhabiting phocid seals. In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 391-421. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder Colo.

In Beaufort Sea, only year-round marine mammal residents are ringed seal, bearded seal. and polar bear. Summer residents include spotted (larga) seal, walrus, beluga whale. and bowhead whale. Stomachs were collected from 21 ringed seals and 3 bearded seals, almost all from western Beaufort Sea. Ringed seal foods: primarily nektonic crustaceans, small benthic crustaceans, and small to medium size schooling pelagic fishes. Bearded seal foods: bivalve molluscs, crabs, shrimps and sculpins, plus a variety of other invertebrates and fishes. Foods of these prey species are described, where known. Interactions with other marine mammals: Diet of belukha whales and spotted seals overlaps with that of ringed seals, but foraging is usually separated in time and space; bowhead whales and ringed seals compete for zooplankton; polar bears eat ringed seals and, less often, bearded seals. Productivity and food chain: The bloom of epontic (under-ice) algae in May and June. and that of planktonic algae in August are the two best known sources of primary productivity; probable paths of consumption are outlined. 2 tab., 6 fig., 55 ref.

1977b. Trophic relationships among ice-inhabiting phocid seals. In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 303-390. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder, Colo.

Study area includes Beaufort, Chukchi and Bering Seas, and is broken down into 4 subareas. Results of this study have been presented in detail in earlier quarterly and annual reports, and are given only in general terms here. Stomach contents have been examined from 218 ringed seals, 110 bearded seals, 26 spotted seals, and 5 ribbon seals. most obtained at coastal seal-hunting native villages. Important prey species of these seals are tabulated by area. Potential effects of petroleum development are discussed. Four translations from the Russian are appended which concern feeding of ribbon and ringed seals, and seals of the east coast of Sakhalin and of the Okhotsk Sea. 21 tab., 5 fig., 54 ref., + app.

1978. Food of ringed seals and bowhead whales near Point Barrow, Alaska. Can. Field-Nat. 92(1):67-70.

Stomach samples were collected from 16 ringed seals and 2 bowhead whales taken in the vicinity of Point Barrow. Euphausiids (Thysanoessa inermis and T. raschii) made up over 3/4 of total combined volume of samples from ringed seal stomachs. Euphausiids (all identifiable material was T. raschii) made up 90.3% of total combined volume of samples from bowhead stomachs. In the northern portion of their range these two species show broad dietary overlap. In general, however, ringed seals utilize many species of fishes and crustaceans, while bowhead whales depend mostly on swarms of small to medium-sized zooplankton. (Previous literature concerning food and feeding of both species' is reviewed.) Extreme year-to-year variability in ice cover in the Beaufort Sea causes fluctuations in primary productivity. Consequences upon the higher trophic levels are considered. There is urgent need for data on the trophic interaction of major components of the arctic ecosystem since drastic environmental modifications such as offshore oil drilling are imminent. Questions about the ecological context of bowhead decline and possibility of recovery are raised. 1 tab., 17 ref.

In press. Potential competition in southeastern Bering Sea: Fisheries and phocid seals. Science in Alaska, Proc. 29th Alaska Science Conf., Fairbanks. Alaska, August 15-17, 1978, 15 p.

From authors' abstract: "Harbor seals in the southeastern Bering Sea eat a variety of fishes, shrimps and octopus. In general the same is true for spotted and ribbon seals. Capelin are a dominant prey item in the diet of spotted seals. Pollock are the major food of ribbon seals. The prey of ringed seals in this region is poorly known. However, fishes, shrimps and zooplankton are all eaten. Bearded seals are benthic feeders eating mostly tanner crabs, spider crabs, and shrimps. Fishes and crustaceans of present or potential commercial value which are also major food items of these seals in southeastern Bering Sea include pollock, capelin, smelt, herring, various flat-fishes, tanner crabs, and pandalid shrimps." A balanced systems management approach for these marine mammal and fishery resources will be possible only when conflicts arising between the Marine Mammal Protection Act and the Fisheries Conservation and Management Act are resolved. 4 tab., 46 ref.

MacAskie, I.B.

1969. Report on Canadian pelagic fur seal research in 1969. Unpubl. manuscr., 35 p. Pac. Biol. Stn., Fish. Mar. Serv., P.O. Box 100, Nanaimo, B.C. V9R 5K6, Can.

(See Pike et al. 1958.) In April and May seals were hunted off southwestern Vancouver Island and Washington State and three cruises were made toward Cobb Seamount (located at 46°45'N. 130°50'W). Pituitary glands and tissue samples for DDT analysis were collected. 9 tab., 4 fig.

1970. Report on Canadian pelagic fur seal research in 1970. Unpubl. manuscr., 16 p. Pac. Biol. Stn.. Fish. Mar. Serv., P.O. Box 100, Nanaimo, B.C. V9R 5K6, Can.

(See Pike, Spalding, et al. 1958.) Seals were hunted from January to March off southwestern Vancouver Island (La Perouse Banks), and Washington State with a trip to Cobb Seamount. Pituitary glands and tissue samples for DDT analysis were again collected. 8 tab., 4 fig.

Machida. Masaaki.

1969. Parasites of the northern fur seal and their relationship to the breeding islands. Proc. Jpn. Soc. Syst. Zool., No. 5, p. 16-17. In Japanese with English summary.

Fur seals were taken off northern Japan and their parasites are listed. The only apparent differences among seals from the Pribilof, Commander, and Kurile Islands were in the occurrence of Unicaria lucasi. The precise nature of these differences is not included in the English summary.

1971. Survey on gastric nematodes of the northern fur seal on breeding islands. Jpn. J. Parasitol. 20(5):371-378. In Japanese with English abstract.

A survey was made on three islands: Robben. Bering (Commander Islands) and St. Paul (Pribilof Islands). These results and those of a previous study of fur seals caught near Sanriku (Pacific coast of northern Japan), are discussed. Infestation was found much higher in the more southern waters for several reasons. Though Delyamure (1955) described definite geographic distributions for each helminth, it was found that helminth infestation could not be used to identify the origin of seals because of intermixing of herds both on land and at sea.

Machida. Saburo.

1970. A sword-fish sword found from a North Pacific sei whale. Sci Rep. Whales Res. Inst. 22·163-164.

Sei whale was taken at 50°52′N, 169°12′W. Sword was enclosed in musculature of whale. Previous literature is reviewed (5 articles).

Maher. W.J.

1960. Recent records of the California grey whale (Eschrichtius glaucus) along the north coast of Alaska. Arctic 13:257-265.

Observations made during the summers of 1953 to 1959, coupled with information from Eskimos, show that grey whales can be found in arctic waters. Over years 1955-59 (on dates ranging from 18 July to 13 Sept.), nine grey whales were taken at Barrow, one at Wainwright. Knowledge of northern summer grounds is briefly reviewed. They are commonly seen in summer from Pt. Barrow to Icy Cape. but rarely east of Barrow. Migration appears to begin in August although some animals were in the Barrow vicinity in mid-September 1959. 1 tab., 2 fig.. 14 ref.

Maher. W.J., and N.J. Wilimovsky.
1963. Annual catch of bowhead whales by Eskimos at Pt. Barrow Alaska, 1928-1960. J. Mammal. 44(1):16-20.

The number of bowheads taken averages 5.8 whales per year. The early migrants are small and appear in early April off Barrow. Migration is thought to continue to June. Exact dates are unknown. Whales migrating south in the fall are first seen in mid- to late August.

Mansfield, A.W.
1970. Population dynamics and exploitation of some arctic seals. P. 429-466 in M W. Holgate (ed.), Antarctic ecology, Academic Press. London.

Article gives the life history of the harp and ringed seals. Population assessments made for the eastern Canadian arctic. Sustainable yields offered.

1971. Occurrence of the bowhead or Greenland right whale (Balaena mysticetus) in Canadian arctic waters. J. Fish. Res. Board Can. 28(12):1873-1875.

Chart shows former known whaling grounds, and current distribution in Canadian arctic waters as reported in Annual Game reports from arctic detachments of Canadian Mounted Police, by ice observers. by other personnel aboard government ships and aircraft, and by pilots of light aircraft. Range of western Canadian arctic sightings extends through Amundsen Gulf to Coronation Gulf. Here herds of 20-30 bowheads have been seen and as many as 100 individuals have been sighted in one season. 2 fig.. 6 ref.

Marine Mammal Biological Laboratory.
1969. Fur seal investigations, 1966. U.S. Fish Wildl. Serv., Spec. Sci. Rep. Fish. 584, 123 p.

Pribilof Is. harvest: 52,497 males, 391 females. Malnutrition, hookworm disease, infections and bite wounds were major causes of death among pups. Pups tagged in September seemed to have survived better than those tagged in mid-August. Number of pups born decreased steadily from 1960 to 1964. Pup nutrition and fur seal milk were studied. Implantation chambers appeared in adult female genital tracts on 4 November. Age determination process, using canine teeth, was tested.

Pelagic research conducted off central and southern California from 21 January to 25 March found seals most numerous near abrupt changes of depth. Of 444 seals collected, 428 were females, half of which were gravid. Stomach contents are reviewed.

1970a. Fur seal investigations, 1967. U.S. Fish Wildl. Serv., Spec. Sci. Rep. Fish. 597, 104 p.

Pribilof Is. harvest: 55,720 males, 10,471 females. Information from Pribilof studies includes: counts of adult males; causes of death among pups; differing weights of pups depending on their rookery origin; tagging and freeze-branding of pups; recovery of U.S. and Soviet tags; population estimates for pups and young males for past years; feeding of captive pups; past and present predicted kills; counts of adult males, and reproductive information on females.

Pelagic activities included: collection of 131 fur seals, mostly off Cape Flattery and La Perouse Bank, Washington, in January and February; analysis of stomach contents, which included shrimp for the first time; distribution studies in the eastern Aleutian Islands area from 20 November to 4 December; observation of Japanese pelagic research, and study of pup feeding on rookery.

1970b. Fur seal investigations, 1968. U.S. Dep. Commer., NOAA Tech. Rep. NMFS SSRF-617, 125 p.

Field investigations in 1968 were made on the Pribilof Islands from June to October, in Washington waters in November-December 1967 and January-February 1968, and in Alaska waters from May to August 1968. Pribilof Is. harvest: 45,625 males, 13,335 females. Collected at sea: 374 seals off Washington, 456 off Alaska. Report includes: causes of death among pups; counts of dead seals; weights; tagging and marking by removal of parts of flippers and results of same; counts of adult males; pregnancy rates; estimates of the number of yearling males for several year classes; two methods of estimating populations; predicted kills; attaching of transmitters to 10 seals, and age determination of males killed.

1971a. Fur seal investigations. 1969. U.S. Dep. Commer.. NOAA Tech. Rep. NMFS SSRF-628, 90 p.

Field investigations of the fur seal in 1969 were conducted on the Pribilof Islands from June to October, and in the eastern North Pacific off the State of Washington in February and March. The kill included 38.678 males and 230 females. Information includes: adult male counts; dead seal counts, pup weights; marking and tagging results; estimates of pups born in 1966 and 1969; forecasted kills; transmitters attached to young males; weights of bacula and testes; organochlorine pesticides found in tissues of fur seals, sea lions and marine birds; fur seals sighted and/or collected off Washington; pregnancy rates, and prey species.

1971b. Fur seal investigations, 1970. Unpubl. manuscr., 155 p. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.

Pribilof Is. harvest: 42,121 males, 120 females. Predicted kill of males had been 53,700. Information given includes: counts of adult males; counts of dead fur seals; causes of death among pups; pup weights; tagging program; pup population estimates for 1966 and 1970; estimates of survival to ages 1 and 2; fur seals sighted and/or collected off Washington; group size at sea; age and reproductive condition of seals collected, and prey species found.

1972. Fur seal investigations, 1971. Unpubl. manuscr.. 132 p. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.

Pribilof Is. harvest: 31,795 males. 103 females. Information from Pribilofs includes: counts of adult males· counts of dead fur seals; causes of death among pups· pup weights; marking of pups; pup population estimates. Reports on seals found off Washington in pelagic study. Appendix D concerns fur seal and sea lion observations in western Aleutian area [See Fiscus, 1972a]. 19 fig., 15 tab. + 35 app. tab.

Marine Mammal Division [new name for Marine Mammal Biological Laboratory].
1973. Fur seal investigations, 1972. Unpubl. manuscr., 93 p. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.

Pribilof Is. harvest: 37,314 males, 79 females. Activities on the Pribilof Islands included: counts of living adult males; counts of dead fur seals; continuation of marking program, and estimates of past pup populations based on mark-recapture data. Activities in other areas included the discovery of an additional rookery of northern fur seals on Castle Rock, a small rocky islet near San Miguel Island. Counts of the colony at Adams Cove and the one at Castle Rock show a population of over 600 animals. Seals were sighted and collected off Washington. Prey species are reported.

1974. Fur seal investigations, 1973. Unpubl. manuscr., 96 p. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.

Pribilof Is. harvest: 28,457 males, 25 females. Information from the Pribilof studies includes: counts of adult males; counts of dead seals; marking, and population estimates. Beginning this year on St. George Island no killing was done and observational studies were conducted relating to abundance and distribution, sex ratio, reproduction, survival, behavior and activity patterns. Northern sea lions were observed attacking fur seal pups. At San Miguel Island, off southern California, an observational study begun in 1969 was continued. Two rookeries, one on the main island and the other on a small islet nearby, accounted for at least 261 pups born in 1973. Pelagic collection of 675 seals (of 1,765 sighted) was conducted within a 20 to 100 mile radius of the Pribilof Islands.

1975a. Birds and mammals observed at sea 1958-1974. Unpubl. data listing. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.

A compilation of marine mammal sightings made during pelagic fur seal research cruises, concerning 25 different species. Sightings of each species are broken down by geographical area (e.g., Gulf of Alaska, Bering Sea). Location is given for each sighting.

1975b. Fur seal investigations, 1974. Unpubl. manuscr., 125 p. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.

Pribilof Is. harvest: 32,976 males, +51 females. Pribilof Islands research included: age determination of some killed males, counts of dead seals, and marking. A new method of estimating natural survival rates was developed. Natural survival rate from birth to age 2 appears significantly lower than in 1929-1933. Causes of death of pups were studied. The second year of behavior research was conducted on St. George Island. There, 27 females were radio-tagged, and sea lions were again seen preying on fur seal pups - 86 kills were observed. Off California, at San Miguel Island fur seal rookeries, influx of Pribilof Island and other northern fur seals continued. Pelagic research involved collection of 323 female and 53 male seals in the vicinity of the Pribilof Islands in the Bering Sea to obtain age-specific pregnancy and ovulation rates of females and to study feeding. Walleye pollock was the predominant prey species found.

1976. Fur seal investigations, 1975. Unpubl. manuscr., 115 p. Northwest and Alaska Fish. Cent., Mar. Mammal Div., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.

Pribilof Islands: Age was determined for 20% of 29.093 male fur seals harvested. The 55 females unintentionally killed were not examined; dead seals were counted; marking was done; an experiment to determine the abundance of subadult males on St. George Island was attempted; causes of pup death were studied. Estimations of pups born in 1967-68 and 1972-74 are explained in detail; homing to island of origin is discussed. St. George Island: The third year of observational research involved investigation of female feeding cycles, female estrus cycle, pup predation by northern sea lions, behavior of fur seals at sea, onshore-offshore movements of subadult males, and female/male interactions. Techniques included bleach-marking, radio tagging and the attachment of depth-time recorders to 5 lactating females, as well as visual observation. San Miguel Island and Castle Rock: the pup count showed 725 pups, a 39% increase over 1974. nocturnal behavior and vocal activity were investigated. Pelagic study. Data collected during cruises 1958-1974 were compiled and preliminary analysis made with emphasis on consumption of walleye pollock.

1977. Fur seal investigations, 1976. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Northwest and Alaska Fish. Cent., Mar. Mammal Div. Seattle, Wash., Processed Rep., 92 p.

Population assessment, Pribilof Islands. Commercial harvest consisted of 23,081 male seals taken on St. Paul Island. Size limit of 47" was imposed. Two hundred male seals were killed for native subsistence on St. George Island. Marked animals recovered during harvest included 3 animals tagged on Bering Island (Commander Islands). Number of pups born on St. Paul Island is estimated at 291,000. Natural survival rates of male fur seals from birth to age 5 are estimated. Alternative harvesting strategies discussed. Counts were made on both islands. Physiology and medicine. Medical staff examined dead pups (main causes of death

were hookworm disease and emaciation syndrome), did bacteriological, immunological, virological, and thermoregulation studies. Behavior and biology, Pribilof Islands. Stages and duration of estrus, management-caused disturbances (possible disruption of mother-young suckling cycle), female feeding cycles (a 12-year comparison), and the effects of oil pollution were subjects of study on St. George Island. Population growth and behavior - San Miguel Island (Adams Cove and Castle Rock). In Adams Cove, female population was estimated at 1200; 417 pups were born. Research included tagging, investigation of pup mortality (heat prostration due to unusually high temperatures took 41 lives). general activity patterns, vocalization, reproduction, and activity as related to light intensity. On Castle Rock, 18 territorial males, 516 adult females, and 521 pups (including 27 dead) were counted; pups were tagged. Pelagic ecosystem. Analysis of data gathered pelagically by U.S. and Canadian scientists 1958-74 continued, correlating age, sex, location, and feeding habits. 13 tab. (+20 app. tab.), 10 fig.

1978. Fur seal investigations, 1977. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Northwest and Alaska Fish. Cent., Mar. Mammal Div., Seattle, Wash., Processed Rep., 94 p.

Population assessment - Pribilof Islands. On St. Paul Island, 28,396 males of maximum length 47" (and 48 females killed unintentionally) were taken in commercial harvest. On St. George Island, 350 males were taken for local subsistence. Age breakdown is given of males harvested 1963-75. Counts were made of adult males (expected increase on both islands found), dead pups, dead older seals, and of pups born. Twelve seals tagged on the Commander Islands were recovered in harvest. Behavior and biology - Pribilof Islands. Increase of adult males and decrease of adult females on St. George Island are discussed. Site fidelity in pups and in mothers was studied. Physiology and medicine. On St. Paul Island, studies were done in pathology, virology, bacteriology, immunology, parasitology, and physiology. On St. George Island, pup mortality was studied. Population growth - San Miguel Island. In Adams Cove, 681 females were counted and 421 pups born. Of 64 pups that died on land, 54 died during abnormally hot periods. Tagging records discussed. At Castle Rock, 617 pups were counted. Pelagic ecosystem. Studies of distribution, migration, growth/age, and feeding have been begun, using data and specimens collected pelagically by U.S. and Canadian scientists 1958-74. 9 tab (+25 in app.), 10 fig. (+5 in app.).

Marquette, Willman M.

1976. Bowhead whale field studies in Alaska, 1975. MFR Paper 1195. Mar. Fish. Rev. 38(8):9-17.

In spring 1975 bowhead whaling activities occurred at these villages for the time periods indicated: Gambell and Savoonga (St. Lawrence Is.) --25 April to 30 May; Kivalina --similar to Point Hope; Point Hope --19 April to 1 June; Wainwright --similar to Barrow; Barrow --21 April to 4 June. Fifteen bowheads were caught (1 at Gambell, 4 at Point Hope, and 10 at Barrow); 2 were killed but lost (1 at Gambell, 1 at Barrow); and 26 were struck but lost (3 at Gambell, 13 at Point Hope, and 10 at Barrow). (No

bowheads were taken in autumn in the autumn whaling locations, Barrow, Nuiqsut. and Kaktovik.) Length and sex of bowheads caught, and sightings of 132 bowheads at Point Hope and 63 at Barrow between April 20 and May 31 are tabulated. Whaling methods, whaling effort, utilization, migration, and other mammals and birds are discussed. Bowhead migration: "Three distinct runs of the bowhead occurred at Point Hope in the spring of 1974. In 1975, only two runs were noted, probably because during late May several open leads existed far offshore from Point Hope, within which the whales may have traveled instead of migrating through the nearshore lead. The first run occurred 20-30 April and the second 10-17 May. Two distinct runs were all that were observed at Barrow this spring, but as at Point Hope additional runs could have moved through large open leads far offshore." Belukha migration: "Although belukha were occasionally observed from 30 April to 1 June, three noticeable waves of these animals migrated past Point Hope whaling camps - the first prior to 30 April, the second 10-15 May, and a third from 22 to 26 May." Marine mammals taken at Point Hope in spring were: 13 belukha (244 sighted), 17 ringed seals, 1 walrus, and 3 polar bears; 2 bearded seals were seen. Marine mammals taken at Barrow in spring were: 17 ringed seals and 1 polar bear. 9 tab., 1 map, 12 photos, 6 ref.

1977. The 1976 catch of bowhead whales (Balaena mysticetus) by Alaskan Eskimos, with a review of the fishery, 1973-1976, and a biological summary of the species. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Northwest and Alaska Fish. Cent., Mar. Mammal Div., Seattle, Wash., Processed Rep., 79 p. +app.

Pt. I. The 1976 catch (25 p.): A total of 48 bowhead whales were butchered in spring and fall 1976 at nine different villages; at least 43 were struck and lost.
Pt. II. Review and biological summary (62 p.): Author discusses legal status of the bowhead whale, history of fishery, breakdown of recent fishery statistics, biological specimens obtained (including stomachs), measurements, reproduction and growth, abundance, historical catch, sightings, counts, current population estimates (ranging from high 100's to 1,000 - 3,000), recent increase in Eskimo harvest, and future research. 29 tab., 12 fig.. 65 ref.

1978. Bowhead whale. P. 70-81 in Delphine Haley (ed.). Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press. Seattle, Wash.

[See Haley, 1978a.]

In press. The 1977 catch of bowhead whales (Balaena mysticetus) by Alaskan Eskimos [SC/30/Doc. 35]. Rep. Int. Whaling Comm. 29. 26 p.

Residents of Gambell and Savoonga (both on St. Lawrence Island), Wales, Kivalina, Pt. Hope, Wainwright, and Barrow engaged in spring whaling. Twenty-six bowhead whales were killed and recovered, 3 were killed and lost, and 79 were struck and lost. Residents of Barrow, Nuiqsut, and Kaktovik killed and recovered 3 bowhead whales in the autumn hunt. Stomach contents of one whale consisted mainly of copepods. Biological samples collected are reported. Fifty-two belukha whales were taken by

residents of Point Hope, with 3 killed but lost. Two belukha whales were taken by residents of Barrow, with 4 killed and lost. Other marine mammals taken at Barrow were: one bearded seal, 3 ringed seals, 6 polar bears and one walrus, with one bearded seal killed but lost. 9 tab., 1 fig., 6 ref.

Masaki, Yasuaki.
1976. Biological studies on the North Pacific sei whale. Bull. Far Seas Fish. Res. Lab. [Jpn.], No. 14, Dec. 1976. 104 p.

Study was done with intention of clarifying life history and discriminating stocks of sei whales in North Pacific. Adult female reproductive cycle: conception in late December· gestation lasting 10-1/2 months; lactation lasting 7 months; resting period lasting 6-1/2 months. Sex ratio among single births approx. 1:1, rate of twinning 0.52%. Length at sexual maturity: 13.4m for females, 12.9m for males. Length at physical maturity: 15.2m for females, 14.3m for males. Mature testis weight .9kg. Age at sexual maturity: 7 years for both sexes. Ovulation rate: Different calculation methods yield rates of from 1.00 to 0.30; reasonable mean annual rate 0.604. Data from whale marking, whale sighting, and specimen data from catch show three different migration and movement patterns in waters (1) west of 180°, (2) between 180° and 160°W, and (3) east of 160°W. Migration is northward in spring and southward in autumn, with discernible segregation by sex and age. Three separate stocks with borders of 175°W and 155°W are identified using whale marking, catch distribution, whale sighting and shape of baleen plates. 12 tab., 72 fig., 121 ref., 1 pl.

Mathisen, Ole A.
1959. Studies on Steller sea lion (Eumetopias jubata) in Alaska. Trans. 24th North Am. Wildl. Conf.:346-356. Wildl. Manage. Inst., Washington, D.C.

Sea lions were studied with special reference to salmon predation. Film types used in aerial surveys conducted from 1953-55 are discussed. From March to December 1956-58 surveys were made in the Gulf of Alaska, Aleutian Islands and Bristol Bay. Counts given: Aleutian Islands - 73,090; Gulf of Alaska - 76,027; Bristol Bay - 147 (includes information from earlier sources). In 1958 the Chernabura Island (Shumagin Islands) rookery was studied. Mating took place 31 May - 10 July; births 25 May - 27 June; pups managed alone by end of July. Reduction of sea lions is suggested because of their predation on salmon (and halibut). 1 tab., 4 fig., 10 ref.

Mathisen, Ole A., Robert T. Baade, and Ronald J. Lopp.
1962. Breeding habits, growth and stomach contents of the Steller sea lion in Alaska. J. Mammal. 43(4):469-477.

Observations of Chernabura rookery, May - July 1958. (See Mathisen, 1959.) From authors' abstract: "... Harem boundaries were indistinct, and the size of a harem varied from day to day as did the number of unattached males near a harem. ... A cow nursed only her own pup or yearling. Harem groups slowly disbanded as pups learned to swim.

Lengths of pups, yearlings, cows and bulls are summarized. Only non-commercial fishes, with the exception of one pink salmon, were found in 114 stomachs. Invertebrates were more frequent than fishes." 3 tab., 3 fig., 8 ref.

Mathisen, Ole, A., and Ron J. Lopp.
1963. Photographic census of the Steller sea lion herds in Alaska, 1956-58. (Contr. No. 83, College of Fisheries, Univ. Wash.), U.S. Fish Wildl. Serv.. Spec. Sci. Rep. Fish. 424, 20 p.

Authors' abstract: "An aerial photographic technique for censusing herds of Steller sea lions (Eumetopias jubata) in Alaska is described. The minimum number of sea lions from Cape St. Elias to the Islands of the Four Mountains was estimated to be about 110,000, based on photographic censuses of rookeries and hauling grounds in 1957. The heaviest population density was recorded in an area between the entrance of Cook Inlet and Unimak Pass. Pronounced seasonal variations were observed, with a peak population on the rookeries from July to September. A partial aerial photo census of the harbor seals (Phoca vitulina) in Alaska is discussed in the appendix."

Mercer, Roger, Howard Braham, and Clifford Fiscus.
1977. Seasonal distribution and relative abundance of marine mammals in the Gulf of Alaska. In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 100-133. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder, Colo.

[This report follows Fiscus, Braham, Mercer, et al. (1976) which addressed the northeastern Gulf of Alaska.] Study area was approximately from Prince William Sound (145°W) to Umnak Island (169°W), i.e., the western Gulf of Alaska. Sightings were gathered through the Platforms of Opportunity program (involving collection of observations from NOAA ships and other sources), OCSEAP contract vessels, and data from pelagic fur seal cruises (1958-73). Computer plots map these sightings of northern sea lion, humpback whale, Dall propoise, killer whale, and blue, fin, and sei whales (3 species together) in different seasons, from 145°W to 158°W (Prince William Sound to Alaska Peninsula). Absence of information from Unimak Pass to the Aleutian oil lease area is noted. Summary of 4th quarter operations presented. 3 tab., 17 fig., 4 ref.

Miller, E.H.
1975. Walrus ethology. I. The social role of tusks and applications of multidimensional scaling. Can. J. Zool. 53:590-613.

Male Pacific walrus were observed for 2 summers on Round Island in Bristol Bay. Land interactions are mostly agonistic. Visual threats and actual strikes with tusks commonly characterize interactions. Dominance accrues to those with larger bodies and longer tusks. Smaller animals receive most of the threats and strikes. 5 tab., 25 fig., 87 ref.

1976. Walrus ethology. II. Herd structure and activity budgets of summering males. Can. J. Zool. 54(5): 704-715.

Observations during two summers on Round Island, Bristol Bay. Walrus haul out on all kinds of terrain; however, they seem to prefer those beaches that are wind sheltered. Herd structure on land was arranged so that the small walrus or those with broken tusks were on the seaward periphery. Centrally-located walrus sleep more. Activity budget given. Author believes gregariousness facilitates search for food and mates as well as creating an advantage in thermoregulation. 5 tab., 9 fig, 45 ref.

Mitchell, Edward.

1968. Northeast Pacific stranding distribution and seasonality of Cuvier's beaked whale (Ziphius cavirostris). Can. J. Zool. 46:265-279.

Author's abstract: "Previously known and new strandings of Ziphius cavirostris are tabulated for the coast of western North America and found to range between Alaska and the tip of Baja California. Strandings are most numerous between February and September, and whales less than about 18 ft long have not usually stranded north of 42°N. Adults and juveniles strand singly, not in mass, but there is evidence for recurrent, single strandings near the same spot at different times."

Mitchell, Edward (ed.).

1975. Review of biology and fisheries for smaller cetaceans -- report and papers from a meeting of the Subcommittee on Small Cetaceans, Int. Whaling Comm., Montreal, April 1-11, 1974. J. Fish. Res. Board Can. 32(7):875-1240 [entire special issue].

Contents: Meeting report -- Research and information, review of smaller cetacea, identity and status of species and stocks, regional accounts, types of fisheries, relationships between cetaceans and other fisheries, catch statistics, biological investigation - methods and techniques, recommendation to the Scientific Committee and other business, appendices. Invited papers -- Biology and current status of species (10); regional accounts of fisheries (7); types of fisheries for cetaceans (6); and incidental capture of cetaceans in fisheries (3).

1978a. Finner whales. P. 36-45 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.] Concerns whales of the genus Balaenoptera: blue, fin, sei, Bryde's and minke whales.

1978b. Origins of eastern North Pacific sea mammal fauna. P. 13-20 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

"All in all, this [present] fauna of sea mammals is large and diverse when compared with others throughout the world. ...About one sixth of these thirty-eight species are found nowhere else in the world but in the North Pacific." Article focusses on assemblages found in California dating from the Miocene period. 9 drawings.

Miyazaki, N., T. Kusaka, and M. Nishiwaki.
1971. Food of Stenella caeruleoalba. Sci. Rep. Whales Res. Inst. 25:265-275.

The stomach contents of 27 dolphins collected from 2 schools off the Japanese coast were examined. Myctophids (lantern fish) and Bentheogennema borealis (shrimp) were the dominant food items, but squid were also found. All food items were pelagic or semi-pelagic species; 74% had luminous organs. The size of fish ranged from 60-300 mm, shrimp from 38-130 mm and squid from 95-190 mm (mantle length).

Mizue, Kazuhiro, Kazumoto Yoshida.
1965. On the porpoises caught by the salmon fishing gillnet in the Bering Sea and the North Pacific Ocean. Fac. Fish., Nagasaki Univ., Bull. 19, 21 p. In Japanese with English summary.

Phocoenoides dalli is found in greater abundance east of 175°W, but Japanese fishermen do not fish that far east. West of 175°W, eleven Japanese salmon fleets caught more than 10,000 (Dall) porpoises yearly in the areas north and south of the Aleutian and Commander Islands. Fifty-four specimens were examined. Comments are included on stomach contents, reproductive condition, and taxonomy.

Mizue, Kazuhiro, Kazumoto Yoshida, and Akiro Takemura.
1966. On the ecology of the Dall's porpoise in the Bering Sea and the North Pacific Ocean. Fac. Fish., Nagasaki Univ., Bull. 21, 21p. In Japanese with English summary.

From Dall's porpoises caught from late May to early August, 1964 and 1965 (during salmon gill netting) in the Bering Sea and North Pacific, researchers studied 148 stomachs and 103 gonads. Stomach contents were not large though food was apparently abundant; squid predominated in stomach contents; and pregnant animals showed less quantity and more diversity than other animals. All infants' stomachs contained only mothers' milk. Length at birth was about 1 m. Gestation seemed to be under one year. Parturition occurred in late July and early August. Since no ripe testes were found, fertilization was presumed to occur later in the year. Fetuses were found in the left uterine cornu in all cases; the left ovary was found to be larger than the right, and of 84 females, 83 ovulated from the left ovary. The corpus albicans apparently remains visible in the ovary throughout life. Most females are sexually mature at two years of age, with length around 170 cm. Additional information on ovaries and ovulation is given. One Baird's beaked whale and one common dolphin were also caught in 1965. Exact locations of captures are not given.

Moiseev, P.A., ed.
1972. Morskie mlekopitayushchie (spravochnik) (Marine mammals (a reference book)), by M.V. Ivashin, L.A. Popov, and A.S. Tsapko. Izd. "Pishch. Prom." (Food Industry Press), Moscow. 303 p. illus. In Russian. (Abstract, introduction and appendices #1,5-19 transl. by Natl. Mar. Fish. Serv., Off. For. Fish.. Lang. Serv. Branch, Washington, D.C., 1974, 28 p.)

Describes marine mammals of the world from order to species, with illustrations. Distribution, migration, and general biology of animals in northern Atlantic and Pacific Oceans and contiguous portions of the Arctic Ocean, and southern hemisphere are discussed. History of exploitation, present condition of stocks, and regulation of kills are given. Hunting and processing are described briefly. Leading commercial species are emphasized. Appendices: Names of pinnipeds in Russian, Latin, and English; names of cetaceans in Russian, Latin, English, Norwegian and Japanese; and various whaling industry statistics, some going back to 1910. 4 whale migration charts.

Moore, Joseph Curtis.

1963. Recognizing certain species of beaked whales of the Pacific Ocean. Am. Midl. Nat. 70(2):396-428.

By examining 18 skulls found along Pacific coasts, the author sorts the animals into 3 species of the genus Mesoplodon. They separate morphologically and geographically into a subarctic species, M. stejnegeri; a south temperate animal, M. bowdoini; and a north temperate species, M. carlhubbsi. Records of all the specimens are reviewed, and measurements are given.

1966. Diagnoses and distributions of beaked whales of the genus Mesoplodon known from North American waters. In K.S. Norris (ed.), Whales, dolphins and porpoises, p. 32-61, Univ. California Press, Berkeley.

Examination of 42 skulls brought out taxonomic differences within 6 species of Mesoplodon, two of which are found in the North Pacific. The distribution of the Bering Sea beaked whale (M. stejnegeri), as judged by stranded specimens, is between 50° and 60°N Lat., but extends as far south as 45°N. In 1944 an arch-beaked whale (M. carlhubbsi) was found in Grays Harbor, Washington; its distribution is usually considered to be the temperate Pacific, south of the range of M. stejnegeri.

1968. Relationships among the living genera of beaked whales, with classifications, diagnoses and keys. Fieldiana: Zool. 53(4).

From the study of 292 skulls, 2 dichotomous keys to the genera were drawn, one based on skulls, the other on teeth. Six genera are diagnosed.

Morejohn, G.V., and D.M. Baltz.

1970. Contents of the stomach of an elephant seal. J. Mammal. 51(1):173-174.

A dead male specimen (Mirounga angustirostris) was found on Sunset Beach, California. Otoliths found in the stomach were primarily from benthic or epibenthic species of teleost fish, supporting the belief that elephant seals are deep diving bottom feeders. Also, the species taken were not the most common species in the area suggesting the seals are selective feeders.

Morgan, Lael.
1977. A new look at subsistence whaling. Alaska 43(9):8-10.

Article focusses on differing viewpoints among Alaskan natives on bowhead whaling. In Barrow, inlanders and others with no apprenticeship in the art of Eskimo whaling are now outfitting their own boats and hunting bowheads. Tradition-oriented subsistence hunters (including many from other areas with less access to paying jobs) worry about abuses of subsistence whaling since they are dependent on it: They may not qualify for high-paying jobs; families are large (Barrow population now 2,500); in Barrow prices of store food are very high; caribou hunting and duck hunting have been outlawed; and fishing lakes have been "killed" by oil exploration activities. Lack of good bowhead census is noted; difficulty of censusing is emphasized. Recent OCSEAP [Outer Continental Shelf Environmental Assessment Program] report is quoted, concluding that one could argue that bowhead population is healthy and increasing. At Inuit Circumpolar Conference in June, Eskimos voted for strong self-regulation.

Murdoch, John.
1885. "Natural history." Part IV, p. 89-200 in Rep. of the international polar expedition to Point Barrow. Alaska (695 p.), Gov. Print. Off., Washington, D.C.

Author lived at Pt. Barrow 8 September 1881 to 29 August 1883. Accounts given of mammals, birds, fishes, insects and marine invertebrates, including a section on mollusks by W.H. Dall, and a short section on plants by Prof. Asa Gray. Appendices are on: surface life - 1) under sea-ice, 2) during voyage from San Francisco to Pt. Barrow, and 3) during season of open water at Pt. Barrow (approx. July - Sept.); and birds observed at Plover Bay, Eastern Siberia, August 1881. Marine mammals at Point Barrow: Polar bear - present year round on ice but not common; harbor seal - occasional at Elson Bay (Pergniak); ringed seal (major subsistence species) - year-round, abundant during season of ice; bearded seal - occurs all year but abundant only in summer and autumn (in loose ice); ribbon seal - rare; walrus - never very abundant, but frequently seen during open or partially open water (whalemen report increasing scarcity in ice field just north of Bering Strait); white whale - occasional large schools during season of open water; narwhal - none seen; killer whale - none seen; bowhead - beginning mid-April (natives killed 3 during 2 seasons). 113 ref.

Murie, J.
1872. On the walrus. Trans. Zool. Soc. London 7:411-464.

The anatomy of a juvenile walrus is carefully described. The skeletal system, locomotion, dentition, viscera, and reproductive organs are reported. Musculature noted in detail.

Murie, Olaus J.
1959. Fauna of the Aleutian Islands and Alaska Peninsula. In O.J. Murie and V.B. Scheffer, Fauna of the Aleutian Islands and Alaska Peninsula, with notes on invertebrates and fishes collected in the Aleutians, 1936-1938 (406 p.), U.S. Fish Wildl. Serv., North Am. Fauna 61:1-364.

Based on survey done in 1936 and 1937. Marine mammals covered are: sea otter - Aleutian population, 2,000; Steller sea lion - seen on 10 islands; northern fur seal - author mentions report of breeding on Buldir Island; harbor seal - small groups seen; ringed seal - none seen; harp seal - Alaskan occurrence questioned; bearded seal - none seen; walrus - none seen. Author notes his lack of experience in observing cetaceans, notes possibility of missing some animals. Right whales and bowheads - none seen; gray whale - none identified; finback whale - several seen; sei whale - several seen; blue whale - tentatively identified; humpback whale - several seen; sperm whale - one seen; killer whale - common; Pacific blackfish (Globicephala scammoni), Pacific striped porpoise (Lagenorhynchus obliquidens), right-whale porpoise, white whale and beaked whales - none seen; harbor porpoise - 5 seen; Dall porpoise - seen twice. Published and unpublished information is reviewed. Aleut and Russian names are given when known.

Naito, Y.

In press. Harbor seal in the North Pacific [FAO ACMRR/MM/SC/44]. In Mammals in the seas, FAO [Food Agric. Org., U.N.] Fish. Ser. No. 5, Vol. 2, 13 p. [This volume will consist of documents of the Food Agric. Org. U.N., Advis. Comm. Mar. Resour. Res., Working Party on Mar. Mammals, from the Sci. Consultation on Mar. Mammals, Bergen, Norway. 31 Aug. - 9 Sep. 1976.]

A review of the taxonomy, distribution and growth of the harbor seal. The distribution of Phoca vitulina largha is given as the Bering, Chukchi and Okhotsk Seas where ice prevails. P. v. richardsi is found from Alaska to Mexico, widely distributed along the coast where they haul out on tidal sand bars or exposed rocks. Population estimates given for the eastern North Pacific are those made by Scheffer in 1958.

Nakashim, Leslie.

1977. Fall whaling in Barrow. Alaska 43(9):97.

Whalemen go 10 to 15 miles out to sea for fall whaling. Dangers, difficulties, and waste are described.

Nasu, Keiji.

1960. Oceanographic investigation in the Chukchi Sea during the summer of 1958. Sci. Rep. Whales Res. Inst. 15:143-158.

Nineteen stations were occupied in the area between Point Hope and the Kolyuchin Gulf and southward to the Bering Strait during 5 days in August. Oceanographic data are presented. Marine productivity appears to increase in the western part and decrease in the eastern part. A map shows sightings of gray whales, 2 right [bowhead] whales, a fin whale, and an unidentified whale, and also shows some previous sightings of gray whales in the Bering Sea. 11 fig.

1963. Oceanography and whaling ground in the subarctic region of the Pacific Ocean. Sci. Rep. Whales Res. Inst. 17:105-155.

Data were obtained by whaling factory and whale marking boats in the North Pacific Ocean and Bering and Chukchi Seas. Extensive oceanographic data were collected. Usual whaling grounds for blue, fin, humpback, sei and sperm whales are discussed. Annual catch by species 1940-1962 is tabulated. "Centers" of 2 fin-whaling grounds (south of Commander Is. and northwest of Unalaska Is.) 1954-1960, are mapped. Areas north and south of Unalaska are particularly productive for all species except perhaps blue whale. 51 fig.

1966. Fishery oceanographic study on the baleen whaling grounds. Sci. Rep. Whales Res. Inst. 20:157-210.

Discusses the Bering Sea, northern North Pacific, and Gulf of Alaska "pelagic" grounds. In the subarctic Pacific, distribution of whaling grounds for blue, fin, sei, and humpback whales is roughly mapped. In the Gulf of Alaska, Japanese catch of baleen whales is tabulated for 1961-64, fin whale catch is mapped in detail. Section on whale movements includes fin whales in subarctic Pacific. 10 tab., 52 fig., 59 ref.

National Marine Fisheries Service [NMFS]/National Oceanic and Atmospheric Administration [NOAA].

1977. Current status of stocks of marine mammals. Part III, p. 38992-39026, in Administration of the Marine Mammal Protection Act of 1972; April 1, 1976 through March 31, 1977. Federal Register 42(147):38982-39030.

Reports are given on 69 species of whales, porpoises, seals and sea lions. Each species report consists of the following sections: distribution and migration, abundance and trends, general biology, ecological problems, allocation problems, and current research.

Nemoto, Takahisa.

1957. Foods of baleen whales in the northern Pacific. Sci. Rep. Whales Res. Inst. 12:33-89.

Presents analysis of stomach samples collected 1954-56. Whaling grounds along Aleutian chain are discussed. Tabulates catch 1952-56 of blue, fin, sei, and humpback whales in Aleutian waters. Discusses: food preference among whale species; hour of feeding as related to diurnal migration of plankton; depth of whale dives; effect of chasing time on stomach contents; fluctuation of food abundance from year to year and corresponding presence of whales, and feeding by "skimming" (sei and right whales) versus "gulping" (blue, fin and humpback whales). Foods include euphausiids, copepods, fish, squid. Zooplankton biology discussed. 26 fig., 74 ref.

1959. Food of baleen whales with reference to whale movements. Sci. Rep. Whales Res. Inst. 14:149-290.

Mentions blue, sei, Bryde's, fin, right, Greenland, gray, humpback and little piked whales. Data come from whales caught in 3 areas: northern North Pacific, waters adjacent to Japan, and Antarctica. In addition to food items found in stomachs of each species, author discusses: "feeding apparatus" in relation to food preference; hours of feeding; natural history of Euphausia superba; yearly fluctuations in abundance and location of foods in North Pacific; quantity of stomach contents; previous publications on feeding; "swallowing" and "skimming" types of feeding; congregation, diurnal migration and depth of food species; weights of stomach contents of fin and sei whales; distribution of whales in North Pacific (especially migrations of fin, sei and Bryde's whales); results of marking research; "dispersive movements" of fin whales, and parasites found as related to whale migration. Appendix gives data on whale marks recovered from fin, sei and Bryde's whales in the North Pacific. One plate, picturing 17 prey species. 43 tab., approx. 40 charts, 149 ref.

1963. Some aspects of the distribution of Calanus cristatus and C. plumchrus in the Bering and its neighboring waters, with reference to the feeding of baleen whales. Sci. Rep. Whales Res. Inst. 17:157-170.

Distributions of the 2 Calanus species were studied using whale stomach contents from 1952-1961, and plankton net studies. Spring and summer concentrations of C. cristatus coincide with fin whale feeding grounds; C. plumchrus likewise corresponds to sei whale. Total catches of fin and sei whales 1952-1961 are mapped. (Includes Gulf of Alaska.)

Nemoto, Takahisa, and Toshio Kasuya.

1965. Foods of baleen whales in the Gulf of Alaska of the North Pacific. Sci. Rep. Whales Res. Inst. 19:45-51.

Stomach contents were examined of blue, fin and sei whales caught in the Gulf of Alaska in 1961, 1962 and 1963. Catch distributions of 1963 are mapped. Right whales are mentioned in coastal waters of Kodiak Island.

Nemoto, T., and K. Nasu.

1963. Stones and other aliens in the stomachs of sperm whales from the Bering Sea. Sci. Rep. Whales Res. Inst. 17:83-91.

Stone and rock fragments found in the stomachs of whales collected from the Aleutians and Bering Sea suggest that sperm whales plow the sea bottom with their lower jaw while chasing food items such as crabs or rays. Such alien materials also indicate sperm whales dive deeper than 200 m.

Newby, Terrell C.

1978. Pacific harbor seal. P. 184-191 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

Newman, Murray A.
1978. Narwhal. P. 138-144 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

Nichols, G., Jr.
1975. Eschrichtius robustus. Oceans 8(3): 60-65.

Records observations on the maternal behavior of the grey whale made during January 1965 from Isla Magdalena, Baja California.

Nichols, J.T.
1950. Additional data on the occurrence of Dall's porpoise. J. Mammal. 31(1):99.

Report of six sightings from the summer of 1926: 5 July, Queen Charlotte Strait; 6 July, inside passage, south of Ketchikan, Alaska; 8-9 July, Cross Sound, Gulf of Alaska; 5 August, at 53°36'N, 145°37'W; 6 August, at 52°19'N, 137°42'W.

Niggol, Karl, Clifford H. Fiscus, Jr., Thomas P. O'Brien, and Ford Wilke.
1960. Pelagic fur seal investigations -- Alaska, 1960. U.S. Fish Wildl. Serv., Bur. Commer. Fish., Mar. Mammal Biol. Lab., Seattle, Wash., Processed Rep., 61 p.

The third year of pelagic research, under the Interim Convention on Conservation of North Pacific Fur Seals, was conducted from March to May from near Sitka into the Gulf of Alaska, in June between Kodiak and Unalaska, and in July and August from Unimak Pass to Pribilof and St. Matthew Islands. Of 1,495 seals collected, 25 bore tags. Ages and reproductive condition were determined. One seal carried twin fetuses. Pregnancies develop more often in the left uterine horn than the right. The numbers of male and female fetuses found were approximately equal. Stomach contents are reported. One killer whale, taken in Chiniak Bay, Kodiak, had fed on halibut.

Niggol, Karl, Clifford H. Fiscus, Jr., and Ford Wilke.
1959. Pelagic fur seal investigations -- California, Oregon, and Washington, 1959. U.S. Fish Wildl. Serv., Bur. Commer. Fish., Mar. Mammal Res., Seattle, Wash., Processed Rep., 92 p.

The second year of pelagic research, under the Interim Convention on Conservation of North Pacific Fur Seals, was carried out from January to April. Concentrations were found west of Point Buchon, south to Point Sur, California, and near the Farallon Islands, California. Of 1,548 seals collected, 37 were males. Age and reproductive condition were determined. Nineteen tagged seals were recovered. Two seals carrying twins were collected. Stomach contents are reported.

Nikolaev, A.M.
1960. O dinamike chislennosti kalanov v SSSR (Change in the number of sea otter in the USSR). Tr. Sakhalinsk. Kompleksn. Nauchno-issled. Inst. 9:108-121. In Russian. (English abstr. in Biol. Abstr., 1963, 72(1):45.)

Describes former and present range in the USSR. Movements occur between Kamchatka and the Kuriles, between the northern and southern Kuriles, and from the Commander Islands to the Aleutian Islands.

1961. (The distribution, quantity and biology of the sea otter). Akad. Nauk SSSR, Tr. Soveshch. Ikhtiol. Komm. 12:24-217. (Transl. by Natl. Mar. Fish. Serv., Off. Int. Fish., Lang. Serv. Branch, Washington, D.C., 1970, Transl. 520.)

Tabulates population estimates for years 1912 to 1939 from Kurile Islands, Kamchatka, Aleutian Islands, Alaska and California. Otter habitat analyzed. Suggests possibility that sea otters give birth only once every two years.

1965. O pitanii Kuril'skikh kalanov i nekotorykh osobennostyakh ikh povedeniya v ledovyi period (On the feeding of the Kurile sea otter and some aspects of their behavior during the period of ice). Izd. Akad. Nauk SSSR, Ikhtiol. Komm., Moscow. In Russian. (Transl. by Bur. Sport Fish. Wildl., Div. Wildl. Res., Seattle, Washington, 1966, 11 p., in E.N. Pavlovskii, B.A. Zenkovich et al. (eds.), Marine Mammals.)

Food species studied by visual observations and inspection of excrement. Species tabulated and broken down by areas: Uruppu Island, Kurile Islands, Commander Islands and Momoren Island. Spherical urchins, loricate mollusks, the wrinkled crab, and the common mussel were apparently most commonly consumed.

1971. Migratsii i lokal'nye peregruppirovki kuril'skogo kalana (Migrations and local regroupings of the Kuril sea otter). Tr. Atlant. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (AtlantNIRO) 39:171-178. In Russian. (Transl. by Fish. Mar. Serv., Ottawa, Canada, 1974, p. 274-283 in K.K. Chapskii and E.S. Milchenko (eds.), Research on marine mammals, Transl. ser. 3185.)

Otters move to the leeward (Pacific) side of the islands when ice is blown down to the Kuriles in autumn. Similar movements occur in the Aleutians. Also, there are known mass migrations of sea otters, occurring under the influence of intensive hunting or severe volcanic activity.

Nikulin, P.G.
1941. Chukotskii morzh (Chukotsky walrus). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 20:21-59. In Russian. (Transl. by Bur. Commer Fish., Seattle, Washington, 1953, 52 p.)

Observations were made in 1934, 1935 and 1937-1939 on nearly 1,000 animals from waters near the Chukot peninsula. Distribution is briefly described as are morphological characteristics and reproductive biology. The walrus is believed to be polygamous. Stomach contents indicate mollusks are the primary food source, and bottom fauna from 30-50 m depth are preferred. Predation by killer whales and polar bears is discussed.

1946. O raspredelenii kitoobraznykh v moryakh, omyvayushchikh Chukotskiy poluostrov (Distribution of cetaceans in seas surrounding the Chukchi Peninsula). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 22:255-257. In Russian. (Transl. by U.S. Nav. Oceanogr. Off., Washington, D.C., 1969, Transl. 428, 3 p.)

Species are listed, noting abundance and the season(s) when each occurs. Data from seven years of irregular observation (1937-1943) are tabulated by month (usually between June and October), species, and point of observation (predominantly from land along Bering Strait). Species, listed in descending order of total number observed, were: gray whale, fin whale, humpback whale, "species not determined", killer whale, beluga, little piked whale, and Greenland (bowhead) whale.

1947. Biologicheskaya kharakteristika beregovykh lezhbisheh morzha na Chukotskom poluostrove (Biological characteristics of shore aggregations of the walrus in the Chukotka Peninsula). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 25:226-228. In Russian. (Transl. by Fish. Res. Board Can., Arctic Unit, Montreal, 1957, Transl. ser. 115, 4 p.)

Using observations from 1934-1941, the author explains shore aggregations. The walruses prefer ice haul-outs, but will remain in ice-free, shallow water areas with abundant benthic fauna during the summer. This necessitates the usage of shore hauling grounds. With the reappearance of drifting ice, the walrus leave the shore.

Nishiwaki, Masaharu.

1962. Aerial photographs show sperm whales' interesting habits. Norsk Hvalfangst-Tid. 51(10):395-398.

Six photographs of sperm whales: (1) a swimming herd, (2) resting herd, (3) group playing with piece of timber, (4) solitary bull, (5) catcher boat shooting into a pod which had formed a circle head-inward "like a marguerite flower" around a whale which had been shot, and (6) a group formed likewise in a circle, from directly overhead.

1966. Distribution and migration of the larger cetaceans in the North Pacific as shown by Japanese whaling results. P. 171-191 in K.S. Norris (ed.), Whales, dolphins and porpoises, Univ. Calif. Press, Berkeley.

Whaling catches reported for 1945-1962 for blue, fin, humpback, sei, Bryde's and sperm whales. Table and map for each species. Area includes North Pacific, Gulf of Alaska, and Bering Sea. Catches are analyzed by 10^{o} squares of area. Months of whaling activity are noted. Population estimates offered.

1967. Distribution and migration of marine mammals in the North Pacific area. Bull. Univ. Tokyo, Ocean Res. Inst. 1:1-64.

Maps and short discussions on present knowledge of distribution of each species of marine mammal (excluding polar bear) found in the North Pacific, Bering Sea and waters north of Bering Strait. Thirteen pinnipeds, 53 cetaceans. Illus.

1975. Ecological aspects of smaller cetaceans, with emphasis on the striped dolphin (Stenella coeruleoalba). J. Fish. Res. Board Can. 32(7):1069-1072.

Author's abstract: "The striped dolphin (Stenella coeruleoalba) is captured by drive fisheries as it migrates along the coast of Japan. The largest school of striped dolphins captured contained 2,838 individuals. Annual catches have reached approximately 20,000 striped dolphins, and it is estimated that the population fished must number 400,000-600,000 animals. Recent variations in catch levels have resulted from economic and environmental fluctuations, not from a decrease in population size."

Nishiwaki, M., T. Hibiya, and S. Kimura.
1956. On the sexual maturity of the sperm whale (Physeter catodon) found in the North Pacific. Sci. Rep. Whales Res. Inst. 11:39-46.

In the Aleutian Islands, 1,060 male sperm whales were caught in 1954 and 1955. The testes were examined and it was found that most individuals over 38 feet in body length have attained sexual maturity. The sperm whales found in the Aleutians were lone bulls.

North Pacific Fur Seal Commission.
1965. North Pacific Fur Seal Commission report on investigations from 1958 to 1961. Kenkyusha Print. Co., Tokyo, 183 p.

Scientists from the U.S., the U.S.S.R., Japan and Canada conducted both land and pelagic research on North Pacific fur seals throughout their range. Areas of study were: population dynamics, distribution and intermixture of seals of different origins, food habits and management needs. 137 tab.

1969. North Pacific Fur Seal Commission report on investigations from 1964 to 1966. Kenkyusha Print. Co., Tokyo, 161 p.

Scientists from the US, the USSR, Japan and Canada conducted both land and pelagic research on the North Pacific fur seal throughout its range. Areas of study were: population dynamics, distribution and intermixture of seals of different origins, segregation at sea, food habits, management and utilization. 161 tab.

1971. North Pacific Fur Seal Commission report on investigations in 1962-63. Kenkyusha Print. Co., Tokyo, 96 p.

Scientists from the US, the USSR, Japan and Canada conducted both land and pelagic research on the North Pacific fur seal throughout its range. Areas of study were: population dynamics, distribution and intermixture of seals of different origins, and food habits. 118 tab.

1975. North Pacific Fur Seal Commission report on investigations from 1967 through 1972. Dependable Print. Co., Inc., Hyattsville, Maryland, 212 p.

Scientists from the US, the USSR, Japan, and Canada conducted both land and pelagic research on the North Pacific fur seal throughout its range. Areas of study were: distribution and intermixture of seals of different origins, segregation at sea, feeding habits, population dynamics, management, utilization, and impact of fur seals on fisheries. 194 tab.

Ohsumi, Seiji.
1966. Sexual segregation of the sperm whale in the North Pacific. Sci. Rep. Whales Res. Inst. 20:1-16.

Very few females are found in Bering Sea and Aleutian area. Those found are associated with warmer water masses. Forty to sixty percent of mature males segregate to high latitudes.

Ohsumi, S.
1975. Incidental catch of cetaceans with salmon gillnet. J. Fish. Res. Board Can. 32(7):1229-1235.

Reports data from salmon research vessels, 1962-1971. Species caught were Dall porpoise, True's porpoise, harbor porpoise, pilot whale and Baird's beaked whale. Many animals were not identified to species. The area fished included northwestern North Pacific, Bering Sea, Sea of Okhotsk and Sea of Japan. 6 fig.

1976. Population assessment of the Californian gray whale [SC/27/Doc 19]. P. 350-359 in Rep. and papers of the Sci. Committee of the Commission - 1975, Int. Comm. Whaling. [By the prior procedure, the material in this volume would have been published in the 26th report of the Int. Whaling Commission.]

Author makes a simple population model, using best available population parameters, to reconstruct history of stock size and to consider exploitation. According to his calculations, the present population of 11,000 is 30% higher than the maximum sustainable yield population level. 2 tab., 4 fig., 6 ref.

Ohsumi, S., and Y. Fukuda.
1975. A review on population estimates for the northern Pacific sei whales. Rep. Int. Comm. Whaling 25:95-101.

Whaling ground has extended southward and eastward to to north of 20°N Lat. (in middle North Pacific) during past 15 years. Catch per unit effort increased until 1968, but has been decreasing yearly since then. Modified De Lury equation, Ohsumi's previous approach, and other estimates are compared and discussed. 1 tab., 2 fig.

Ohsumi, Seiji, and Yasuaki Masaki.
1977. Stocks and trends of abundance of the sperm whale in the North Pacific. Rep. Int. Whaling Comm. 27·167-175.

Catch per unit effort records 1954-75, and differential pregnancy rates indicate a separation of stocks of females with a boundary line at approximately 160°W. Catch records and tagging records show a congregation of males from both east and west stocks in the Aleutian Island area ("intermingling males") which are taken to be surplus males. Catch of sperm whales 1949-75 in North Pacific is newly analyzed by these stocks: western, eastern, and intermingling. Charts show catches of each sex 1949-1975, movements of tagged whales, schematic figure of distribution for each sex and stock. Estimated current population sizes of mature females are: western stock -- 84,900-137,900; eastern stock -- 56,700-83,300. 2 tab., 11 fig., 7 ref.

Ohsumi, Seiji, Yasuaki Masaki, and Shiro Wada.
1976. A note on the distribution of some smaller cetaceans in the North Pacific. Int. Whaling Comm., Scientific Comm. London, 1976. IWC/SC/28/20. 2 p. + figs.

Maps show average density distribution during spring-summer, by 5°x5° squares, of Baird's beaked whales, killer whales, and "other small cetaceans" (could be mostly Phocoenoides dalli in the north and mostly Stenella spp. in the south, and includes some pilot whales), using whale sighting data from years 1965-1975, the reliability of which is considered lower for small cetaceans than for commercial species. Area surveyed is North Pacific, Bering Sea, and Gulf of Alaska (approximately Lat. 25°-65°N, Long. 150°E-125°W). 4 fig.

1977. Seasonal distribution of sperm whales sighted by scouting boats in the North Pacific and southern hemisphere. Rep. Int. Whaling Comm. 27:308-323.

Areas surveyed were predominantly waters of latitude greater than 30°. Seven charts show density distribution of sighted whales in North Pacific by month, April - September 1965-74. Others show Antarctic similarly. Same data are also shown in graphs and tables. 2 tab., + 4 app. tab., 6 fig.

Ohsumi, S., M. Nishiwaki, and T. Hibiya.
1958. Growth of fin whales in the Northern Pacific. Sci. Rep. Whales Res. Inst. 13:97-133.

Data were collected on whales caught from 1952 to 1957, in the North Pacific from 48°N to the Bering Sea. The process of growth was divided into 6 stages: fertilization, birth, weaning, pre-puberty, sexual maturity and physical maturity. At four years, fin whales approach sexual maturity, at which time males average 58 feet and females 61 feet. Physical maturity occurs at 24 years, when the average length is 62 feet in females. Shrinkage of about 1 foot occurs after physical maturity is attained. Maximum life expectancy is estimated to be 50 years.

Ohsumi, S., Y. Shimadzu, and T. Doi.
1971. The seventh memorandum on the results of Japanese stock assessment of whales in the North Pacific. Rep. Int. Comm. Whaling 21:76-89.

Index of abundance tables presented using CPUE (catch per unit effort) and whale sightings for fin, sei, sperm, blue, humpback and right whales. Estimations on population size given for each species. Maximum sustainable yield and changes in population size offered.

Ohsumi, S., and S. Wada.
1972. Stock assessment of blue whales in the North Pacific. Int. Whaling Comm., Scientific Committee paper, IWC/SC/24/13, 20 p. (Avail. Northwest and Alaska Fish. Cent., Natl. Mar. Mammal Lab., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.)

Population sizes estimated using population model, whale sighting and marking. Figure shows Japanese catch of blue whales (per 1^{o} square) 1952-1965. Biological parameters used are described. Boundary between stocks is taken to be 175^{o}E-180^{o}. Population size in 1972 is estimated at 1,500, or 30% of initial level and 65% of MSY level. Main whaling grounds were Gulf of Alaska, south side of eastern Aleutian Islands, and east side of Kamchatka Peninsula. 14 fig., 1 tab. [Copy seen may be incomplete.]

1974. Status of whale stocks in the North Pacific, 1972. Rep. Int. Comm. Whaling 24:114-126.

Gives catch of large whales by 3 Japanese and 2 Soviet expeditions, and 8 Japanese land stations in 1972. Indices of abundance were calculated from (1) Japanese catch and effort data, 1966-1972, for fin, sei, and sperm whales, and (2) Japanese sighting data, 1965-1972, for fin, sei, sperm, minke, blue, humpback, and right whales. North Pacific area of operation used for these calculations is roughly from 35^{o}-65^{o}N (including the Bering Sea and Gulf of Alaska), excluding certain northwest Pacific areas. Indices of abundance of fin whale and sei whale derived from catch/effort data, sightings, and a population model are compared; shortcomings are discussed. Indices of abundance are tabulated by species and area. 2 fig., 8 tab., + app.'s.

Okutani, Takashi, and Takahisa Nemoto.
1964. Squids as the food of sperm whales in the Bering Sea and Alaskan Gulf. Sci. Rep. Whales Res. Inst., 18:111-122.

Seven genera of squid were found in stomachs of sperm whales from Aleutian Island waters, Bering Sea and Alaskan Gulf. Distribution of whales caught is mapped, according to (1) whether they contained fish or squid, and (2) what kind of squid they contained. Squids predominated over fish in stomachs from the western part of the Aleutian chain, while fish predominated in those from the Gulf of Alaska. 5 pl., 5 fig.

Omura, Hideo.
1955. Whales in the northern part of the North Pacific. Norsk Hvalfangst-Tid. 44(6):323-345, 44(7):395-405.

Describes history of whaling in the North Pacific and compiles catch statistics since beginning of commercial whaling. Recent Japanese catches on each of 3 whaling grounds, (1) south of Commander Islands, (2) north of the eastern Aleutian Islands, and (3) south of the eastern Aleutian Islands, are analyzed for each species by sex, length and sexual maturity. Composition of catch in Alaska region is given for 1912-1939. Blood group studies of fin whales are discussed. Also reports on 2 marking cruises. 17 tab., 18 fig.

1958. North Pacific right whale. Sci. Rep. Whales Res. Inst. 13:1-52.

Black right whales appear in the Bering Sea in June and stay all summer. Sightings from 1941-57 are mapped by months; April, May, June and July-September. Numerous sightings occurred between Pribilof Islands and Aleutian Islands in July. In June and July a few were seen as far east as the Shumagin Island region. Whales sighted near the Aleutian Islands are thought perhaps to belong to a "Kodiak Ground" stock. Of all sightings, 68% were of single individuals. Largest group seen was four. Exhaustive physical description given of 2 right whales taken near Japan. 8 pl., 27 fig., including 25 photos.

Omura, Hideo, and Seiji Ohsumi.

1964. A review of Japanese whale marking in the North Pacific to the end of 1962, with some information on marking in the Antarctic. Norsk Hvalfangst-Tid. 53(4):90-112.

Reports on marking of blue, fin, humpback, sei (and Bryde's), and sperm whales from 1949 to 1962. Of 3,343 whales marked, 282 were recaptured, 80% of which were fin and sperm. Area included waters east of Japan to Long. 160°E, waters south of the Aleutian chain, the Gulf of Alaska and the Bering Sea. Maps show movements of recaptured whales summarized by species. Appendix gives sex, length, date and locations of marking and recapture of each whale. 12 tab., 5 maps.

1974. Research on whale biology of Japan with special reference to the North Pacific stocks. P. 196-208 in W.E. Schevill, ed., The whale problem: a status report, Harvard University Press. Cambridge, Massachusetts.

Stock assessments for the North Pacific were derived from 5 sources: whaling statistics, whale sightings, whale marking, biological investigations of whale carcasses, and stock identification. The object was to determine the maximum sustainable yield for 4 species of whale (fin, sei, sperm and blue). Attempted derivation of reproductive relationships from catch-per-unit-effort data is discussed. Uncertainty of age determination by ear plugs is mentioned. Table of stock assessment provided. 2 tab., 2 fig., 26 ref.

Omura, H., S. Ohsumi, T. Nemoto, K. Nasu, and T. Kasuya.

1969. Black right whales in the North Pacific. Sci. Rep. Whales Res. Inst. 21:1-78.

Thirteen right whales were collected from the coast of Japan, Kodiak waters, the Bering Sea and the Okhotsk Sea. A detailed morphology is presented that includes coloration, bonnet, hair, osteology and body proportions. In May, right whales appear north of 57°N, and by June they have moved into the Bering Sea. The northern limit was thought to be 63°N but some have been sighted in the Chukchi Sea. Their principal food items are calanoid copepods and euphausiids. Data of Klumov (1962) are summarized. 38 tab.+ 4 app. tab., 27 fig., 18 pl., 64 ref.

Øritsland, N.A.
1975. Insulation in marine mammals: the effect of crude oil on ringed seal pelts. Appendix A, p. 48-66, in Thomas G. Smith and Joseph R. Geraci, The effect of contact and ingestion of crude oil on ringed seals of the Beaufort Sea, Dep. Environ. [Can.], Beaufort Sea Project, Victoria, B.C., Beaufort Sea Tech. Rep. #5 (66 p.).

Thermal and optical measurements were made on dead pelt samples using Norman Wells crude oil (of low viscosity). Insulation conditions in nature are described. From discussion: "The major effect of Norman Wells crude oil on the fur of the ringed seal is to increase the solar heating of the animal's skin." 2 tab., 7 fig., 12 ref.

Orr, Robert T.
1966. Risso's dolphin on the Pacific coast of North America. J. Mammal. 47(2):341-343.

On 11 June 1963 a specimen was found on the beach near Princeton, California. The stomach contained 3 squid jaws from Dosidicus gigas. Description and body measurements are given. Summary of the records of Grampus griseus on the Pacific coast is provided.

Osgood, Wilfred H., Edward A. Preble, and George H. Parker.
1951. The fur seals and other life of the Pribilof Islands, Alaska, in 1914. U.S. Bur. Fish., Bull. 34, 168 p.

Reports on observations from 21 June to 30 August 1914. Fur seals totalled about 300,000. Contains extensive discussion of Pribilof fur-sealing, including sealing history; age structure of population; recommendations for management, legal and social aspects. Among other animals covered are Steller sea lion and sea otter. Sea lions, which formerly numbered in thousands, were estimated at "a few hundred on both islands". They are present the whole year, being "more scattered in winter". Sea otters, discovered in the Pribilofs in 1786 were scarce by 1811, "extinct" by 1840. No current Pribilof population is known, though a handful of sightings of single individuals were reported beginning in 1889.

Panina, G.K.
1966a. O pitanii sivucha i tyulenei na Kuril'skikh ostrovakh (On the feeding of the sea lion and seals on the Kurile Islands). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 58:235-236. In Russian. (Transl. by U.S. Dep. Inter., Bur. Commer. Fish., Seattle, Wash., 1966, p. 140-141 in K.I. Panin (ed.), Soviet research on marine mammals of the Far East.)

Sea lions, harbor seals and island seals (Phoca insularis, described by Belkin in 1964, as a new species) were taken from 18 islands of the Kuril Ridge in 1963 and 1964. Stomach contents are briefly reported and tabulated. Contents included fishes, cephalopods, crustaceans, milk, rocks and sand.

1966b. Pitanie morskikh kotikov v zapadnoi chasti Tikhogo okeana (Food of fur seals in the western part of the Pacific Ocean). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 58:23-40. In Russian. (Prelim. transl. by Fish. Res. Board Can., Biol. Stn. Nanaimo, British Columbia, Transl. Ser. 766, 15 p.)

Investigations were conducted from 1958 to 1963 (March to June) in winter-spring settlements and during seal migrations. Most seal collections were made 250 miles east of Honshu Island. Contents of 2,611 stomachs were analyzed. Prey species are described and pictured. In June occurrences of lantern fish dropped off steeply, while squid increased to 90%. Time of feeding depends on availability of prey. Fish and squid habitats and migrations are discussed. Fur seal's food consumption was calculated to be 17g per day: 1,020g fish, 680g squid (live weight). Qualitative differences in stomach contents for different age and sex groups were not detected. 6 tab., 6 fig.

1971. Kharakter raspredeleniya kotikov, zimuyushchikh v Yaponskom more (Distribution of fur seals wintering in the Sea of Japan). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 82:14-24. In Russian. (Transl. by Fish. Res. Board Can., Arctic Biol. Stn., Ste. Anne de Bellevue, Quebec, Canada, 1973, Transl. Ser. 2571, 18 p.)

From 1959 to 1968, between January and May, 1,743 seals were collected in the Sea of Japan. Females outnumbered males overall in a ratio of 1:1.3, and 85% of all females caught were 7 years of age or older. Of males caught, most were aged 3-4 years; 23.2% were mature. One- and two-year-olds of both sexes were sparse. The main regions of habitat are the Gulf of Korea and the Yamato Shallows in the central part of the sea. Age and sex composition of seals caught is is tabulated by month. Concentrations and apparent movements of different groups are shown in figures. Food plays a part in determining locations of different age and sex groups.

Peterson, R.S., and B.J. LeBoeuf.

1969. Population studies of seals and sea lions. Trans. 34th North Am. Wildl. Nat. Resour. Conf.:74-79. Wildl. Manage. Inst., Washington, D.C.

Authors report on two years of study, concentrating on northern elephant seals and California sea lions, but including the Steller sea lion and the two fur seals of California, Callorhinus ursinus and Arctocephalus townsendi. Techniques were censusing, marking and behavioral observation. Study areas were the islands of South Farallon, Ano Nuevo, San Miguel, San Nicolas (California) and Guadalupe (Baja California). Total world population of northern elephant seals is estimated at 30,000. Population of California sea lions at two centers, San Miguel and San Nicolas Islands, is estimated at 40,000.

Peterson, R.S., B.J. LeBeouf, and R.L. DeLong.
1968. Fur seals from the Bering Sea breeding in California. Nature 219(5157):899-901.

One hundred fur seals, including 40 newborn pups, were discovered on San Miguel Island, off southern California. Behavior is described. 3 photos.

Pike, G.C.
1953. Two records of Berardius bairdi from the coast of British Columbia. J. Mammal. 34(1):98-104.

Documents two catches by whalers off Vancouver Island. First taken 5 July 1950, 10 miles off Kains Island; second taken 9 August 1951, 20 miles east southeast of Cape St. James. Measurements given. Stomachs contained squid parts and small rockfish. British Columbia whalers report that schools of Baird's whale are commonly seen in July and August.

1960. Pacific striped dolphin, Lagenorhynchus obliquidens off the coast of British Columbia. J. Fish. Res. Board Can. 17(1):123-124.

Records encountering a school of 1000 striped dolphins 25 miles off Queen Charlotte Islands (53°30'N, 133°40'W) in June 1959. The school was travelling at about 20 knots and was accompanied by three fur seals.

1961. The northern sea lion in British Columbia. Can. Audubon 23:1-5.

Describes distribution from southern California to the arctic. Estimates Alaska populations at 150,000; British Columbia, 12,000; Oregon, 1,000; Washington, 500; California, 3,000. Of the total British Columbia population, 70% is found on 2 rookeries, west of Cape Scott and south of Cape St. James. Seasonal food intake and food species are discussed.

1962. Migration and feeding of the gray whale (Eschrichtius gibbosus). J. Fish. Res. Board Can. 19(5):815-838.

Observations of gray whales from the coasts of British Columbia, Washington and Alaska are combined with published accounts in an effort to define the timing and route of migration, and feeding areas in the Bering and Chukchi Seas. Route between British Columbia and Bering Sea is still unconfirmed. Feeding observations, particularly around St. Lawrence Island, are given. 4 fig. (incl. 2 maps)

Pike, G.C., and I.B. MacAskie.
1966. Report on Canadian pelagic fur seal research in 1966. Fish. Res. Board Can., Pac. Biol. Stn. Nanaimo, British Columbia, Manuscr. Rep. Ser. (Biol.) 875, 20 p.

(See Pike, Spalding, et al., 1958.) From March to June, seals were hunted off Washington and British Columbia, with two trips to Cobb Seamount. 8 tab., 5 fig.

1967. Report on Canadian pelagic fur seal research in 1967. Unpubl. manuscr., 15 p. Pac. Biol. Stn., Fish. Res. Board Can., P.O. Box 100, Nanaimo, B.C., V9R 5K6, Can.

(See Pike, Spalding, et al., 1958.) From late March to June, seals were hunted off Washington and Vancouver Island, with one trip to Cobb Seamount. Pituitary glands were collected. 8 tab., 2 fig.

1968. Report on Canadian pelagic fur seal research in 1968. Unpubl. manuscr., 20 p. Pac. Biol. Stn., Fish. Res. Board Can., P.O. Box 100, Nanaimo, B.C., V9R 5K6, Can.

(See Pike, Spalding, et al., 1958.) From March to July, seals were hunted along the North American coast from the mouth of the Columbia River to Kodiak Island. Pituitary glands were again collected. 9 tab., 3 fig.

1969. Marine mammals of British Columbia. Fish. Res. Board Can., Bull. 171, 54 p.

Records of cetaceans and pinnipeds in British Columbia and into the Gulf of Alaska up to 1967 were compiled from published and unpublished records. An account is given for each species with information on distribution, measurements, and incidental observations of interesting phenomena. A photograph or drawing is also given for each species. No abundance information is included except the occasional comment that a species is rare.

Pike, G.C., I.B. MacAskie, and A. Craig.
1965. Report on Canadian pelagic fur seal research in 1964. Unpubl. manuscr., 16 p. Pac. Biol. Stn., Fish. Res. Board Can., P.O. Box 100, Nanaimo, B.C., V9R 5K6, Can.

(See Pike, Spalding, et al., 1958.) From April to June, seals were hunted off Vancouver Island. 9 tab., 3 fig.

1966. Report on Canadian pelagic fur seal research in 1965. Unpubl. manuscr., 17 p. Pac. Biol. Stn., Fish. Res. Board Can., P.O. Box 100, Nanaimo, B.C., V9R 5K6, Can.

(See Pike, Spalding, et al., 1958.) From April to June, seals were hunted off British Columbia, Washington, Oregon, and northern California. From 10 November to 12 December, a cruise was made from Victoria to the Pribilof Islands and back, carrying scientists from both Canada and the U.S. Reproductive data were compared among seals taken by the U.S., the U.S.S.R., Japan and Canada. 7 tab., 1 fig.

Pike, G.C., and B.E. Maxwell.
1958. The abundance and distribution of northern sea lions (Eumetopias jubata) on the coast of British Columbia. J. Fish. Res. Board Can. 15(1):5-17.

Abundance and distribution of the northern sea lion in British Columbia waters are described on the basis of aerial surveys made in 1956-57. Compared with similar surveys made in 1913, 1916, 1938 and 1955, the number of sea lions had not changed significantly: Estimated population in 1913 was 12,000-13,000; estimate in 1956 was 11,000-12,000. Major changes over this period were in distribution and use of different rookeries. Efforts to reduce population, present rookeries, and some reproductive biology are also discussed. Annual destruction of over 1,000 sea lions is shown to be ineffective in reducing the population in general, but has eliminated some accessible rookeries.

Pike, G.C., D.J. Spalding, I.B. MacAskie, and A. Craig.
1959. Preliminary report on Canadian pelagic fur seal research in 1959. Unpubl. manuscr., 51 p. Pac. Biol. Stn., Fish. Res. Board Can., P.O. Box 100, Nanaimo, B.C., V9R 5K6, Can.

(See Pike, Spalding, et al., 1958.) From March to July seals were hunted from the mouth of the Columbia River to Kodiak Island, Alaska. 11 tab., 5 fig., 17 charts.

1960. Report on Canadian pelagic fur seal research in 1960. Unpubl. manuscr., 92 p. Pac. Biol. Stn., Fish. Res. Board Can., P.O. Box 100, Nanaimo, B.C., V9R 5K6, Can.

(See Pike, Spalding, et al., 1958.) From March to May seals were hunted from the mouth of the Columbia River to Hecate Strait (Queen Charlotte Islands). Reproduction study is presented in detail. 15 tab., 16 fig., 8 pl.

1961. Report on Canadian pelagic fur seal research in 1961. Unpubl. manuscr., 35 p. Pac. Biol. Stn., Fish. Res. Board Can., P.O. Box 100, Nanaimo, B.C., V9R 5K6, Can.

(See Pike, Spalding, et al., 1958.) From late January to May, seals were hunted in Knight Inlet, Hecate Strait, off southwestern Vancouver Island, and off Cape Flattery, Washington. Known accumulations were sampled repeatedly. 15 tab., 5 fig.

1962. Report on Canadian pelagic fur seal research in 1962. Unpubl. manuscr., 35 p. Pac. Biol. Stn., Fish. Res. Board Can., P.O. Box 100, Nanaimo, B.C., V9R 5K6, Can.

(See Pike, Spalding, et al., 1958.) Seals were hunted from February to June in Hecate Strait, off the west coast of Vancouver Island, and in the Gulf of Alaska. 10 tab., 9 fig.

1963. Report on Canadian pelagic fur seal research in 1963. Unpubl. manuscr., 29 p. Pac. Biol. Stn., Fish. Res. Board Can., P.O. Box 100, Nanaimo, B.C., V9R 5K6, Can.

(See Pike, Spalding, et al., 1958.) Seals were hunted off the west coast of Vancouver Island in April and May, and on Portlock Banks, Gulf of Alaska, in June and July. Information on reproductive condition of females taken from the western North Pacific is included. 15 tab., 4 fig.

Pike, G.C., D.J. Spalding, I.B. MacAskie, and F.P.J. Velsen.
1958. Preliminary report on Canadian pelagic fur seal research in 1958. Unpubl. manuscr., 76 p. Pac. Biol. Stn., Fish. Res. Board Can., P.O. Box 100, Nanaimo, B.C., V9R 5K6, Can.

Representatives of Canada, Japan, the U.S.S.R., and the U.S.A. signed the Interim Convention on Conservation of North Pacific Fur Seals in 1957. Each of the four parties agreed to take annually a given number of fur seals at sea for research purposes. Results are presented in terms of age, growth, reproduction, migration, density, distribution, feeding habits, and tag recoveries. Charts show seals sighted and those killed. In 1958, Canadian vessels hunted seals from February to July, from the mouth of the Columbia River to Portlock Banks off Kodiak, Alaska. Skins were sold. 22 tab., 16 fig., 22 charts.

Pikharev, G.A.
1946. O pitanii akiby Phoca hispida (The food of the seal Phoca hispida). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 22:259-261. In Russian. (Transl. by Fish. Res. Board Can., 1957, Transl. Ser. 150, 3 p.)

The stomachs of 377 animals taken in the spring of 1939 from the Shantar Sea and Sakhalin Bay were examined. Most animals were taken on ice floes and only 5% contained food. Primarily shrimp (Thysanoessa, Mesidothea, Pandalus) and gamariid amphipods were found.

Pitcher, Kenneth W.
1975. Distribution and abundance of sea otters, Steller sea lions, and harbor seals in Prince William Sound, Alaska. Appendix A, 31 p.+19 charts, in Donald G. Calkins, Kenneth W. Pitcher, and Karl Schneider, Distribution and abundance of marine mammals in the Gulf of Alaska. Unpubl. manuscr., Alaska Dep. Fish Game, Div. Game, 333 Raspberry Rd., Anchorage, AK 99502.

Report on two helicopter surveys, June 1973 and March 1974, and supplemental small plane and boat surveys. Sea otter: counts tabulated from present and previous surveys; history of occurrence discussed; census techniques evaluated; sexual segregation and shifts in distribution discussed; sound population estimated at 5,000. Steller sea lion: habits, habitat, shifts in distribution, decrease in population discussed; counts tabulated and charted; current population estimated at (minimum) 6,500-7,500. Harbor seal: preferred types of hauling grounds and rookeries, including ice in winter, are discussed; thorough surveys are lacking; summer concentration sites are mentioned. Sightings are reported for Dall porpoise, minke whale, humpback whale, killer whale and northern fur seal. Charts show sea otter and harbor seal distribution.

1977. Population productivity and food habits of harbor seals in the Prince William Sound - Copper River Delta area, Alaska. Final rep. to Mar. Mammal Comm. 36 p. (Avail. Natl. Tech. Inf. Serv., Springfield, Va.)

Between July 1972 and November 1975, 199 seals were collected and measurements and specimens taken, for age determination, reproductive analysis and food habit studies. Results showed: 10.5 months gestation including 2.5-month delay of implantation; pupping May 20 - early July; lactation 3-6 weeks followed by ovulation; sexual maturity attained by males by age seven, females at age 3-5; ample blubber reserves in winter, less by mid-summer; 1:1 sex ratio, average annual mortality rate of 24% for ages 4-21, gross annual productivity of 18.8%; dominant food items pollock, herring and cephalopods (Prince William Sound), and eulachon (Copper River Delta). 12 tab., 7 fig., 52 ref.

Pitcher, Kenneth, and Donald Calkins.
1977. Biology of the harbor seal, Phoca vitulina richardi, in the Gulf of Alaska. In Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators for the year ending March 1977, Vol. 1, Receptors - mammals, p. 189-225. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Environ. Res. Lab., Boulder, Colo.

Aerial survey on 2 September 1976 indicated a minimum population of 13,000 on Tugidak Island, the largest known single concentration of harbor seals. Locations of harbor seal concentrations observed are tabulated, with dates and numbers of animals. From Kodiak area to Kayak Island, 154 seals were collected. Age, length, and weight are correlated in tables. Principal prey species identified are Theragra, Octopus, Gadus, Ammodytes, Mallotus, and families Cottidae and Pleuronectidae, in some areas. Reproductive cycle is described as in Pitcher (1977) except that age of onset of female sexual maturity is given as 5-8 years. It is recommended that disturbances to the outer continental shelf be restricted during pupping season (15 August - 15 October), and molting season (15 May - 15 July). Appendix on human disturbance. [See Brian W. Johnson, 1977.] 11 tab., 7 fig., 17 ref.

Polar Record.
1966. The status of the polar bear. Polar Rec. 13(84):327-336.

Distribution is said to be between 88°N and 60°N. Estimates of world population have ranged from 19,000 to 5,000. Gives reports submitted by delegations to the conference in 1965, at the University of Alaska. In Alaska, bears are found on sea ice south to St. Lawrence Island. They do not regularly come ashore in Alaska and no denning places are known.

Popov, L.A.
In press. Status of main ice forms of seals inhabiting waters of the USSR and adjacent to the country marine areas [FAO ACMRR/MM/SC/51]. In Mammals in the seas, FAO [Food Agric. Org., U.N.] Fish. Ser. No. 5, Vol. 2, 17 p. [This volume will consist of documents of the Food Agric. Org. U.N., Advis. Comm. Mar. Resour. Res., Working Party on Mar. Mammals, from the Sci. Consultation on Mar. Mammals, Bergen, Norway, 31 Aug.-9 Sep. 1976.]

For North Pacific seals, a brief description of the seal, its distribution, reproductive capacity, exploitation, census and trophic relationships are given. Population estimates for the Bering Sea are: ringed seal - 70,000-80,000; ribbon seal - 60,000 in 1969; bearded seal - 250,000; larga seal - 135,000. The predominant food item of the ringed seal was cod in May and June, but this seal exhibits a seasonal shift in food items. The ribbon seals feed primarily on crustaceans and to a lesser extent on fish and cephalopods. They can exploit food resources to a depth of 200 m. Bearded seals feed in water less than 200m deep on benthic crab, shrimp (Gragonidae), mollusks (Gastropods) and polychaetes. The larga seal feeds primarily on fish, cephalopods and crustaceans. Principal food items vary with the age of the seal. Young take amphipods, shrimp and shoaling fish; immatures and adults feed on pelagic fish (flounder, pollack, cod), octopus and crustaceans, and in autumn on salmonids.

Potelov, V.A.
1975. Biological background for determining the abundance of bearded seals (Erignathus barbatus) and ringed seals (Pusa hispida). In K. Ronald and A.W. Mansfield (eds.), Biology of the seal. Rapp. P.-v. Réun. Cons. int. Explor. Mer 169:553.

Discusses the problem of estimating populations based on vessel counts of swimming seals.

Prasil, R.G.
1971. Distribution of sea mammals and associated land mammals found along the Katmai coast, Katmai National Monument. Science in Alaska, Proc. 22nd Alaska Sci. Conf., College, August 17-19, 1971, p. 132. [Abstr. only.] [Additional material on this presentation has been consulted, and is avail. Northwest and Alaska Fish. Cent., Natl. Mar. Mammal Lab., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way N.E., Seattle, Washington 98115.]

Ten flights and 25 hours of observation from a boat were conducted by Park Service personnel from July 1969 to June 1971, along the Katmai coast, surveying for marine mammals in the area. General seasonal distribution and maximum numbers observed are given for sea otter, sea lions and hair seals. A brief description of the different habitat types available to each species is given by coastal zone.

Rainey, Froelich G.

1940. Eskimo method of capturing bowhead whales. J. Mammal. 21(3):362.

Letter dated 19 April 1940 is printed. Author, doing anthropological study at Tigara (vicinity of Pt. Hope), participated in whale-hunt, and describes experiences. Failure of bombs to explode, and premature explosions of bombs and shells (involving one death) are reported. Number of whales seen is reported at 20 or more per day. "Sometimes there are three together and then they seem to be playing. We got right in the middle of one of these games but could not get over top of any one even though they rose all around us."

1947. The whale hunters of Tigara. Am. Mus. Nat. Hist., Anthropological Papers 41 (part 2):231-283.

Author spent most of 1940 (plus several previous summers doing archeological work) at Tigara, an ancient Eskimo village at the western tip of Pt. Hope with a population of 250 Eskimos. "Social structure of Tigara village in the 19th century" and "the yearly cycle before 1900" (reconstructed from conversations with the old men of the village) are explained. Included are descriptions of hunting of seal, bearded seal, walrus, beluga (with nets), birds, fish, and above all, bowhead whale, together with associated customs, rituals and ceremonies. As many as 15 to 18 bowhead whales might be taken in the spring season by the combined crews of the village in the days before American whalers came (before 1850). Whales were abundant and only young ones (ingutuk) were pursued. Now 3 or 4 whales represent a very successful season. A brief description of "Tigara today" concludes.

Ramsey, D.H.

1968. Diurnal fluctuations in censuses of migrating California gray whales. Norsk Hvalfangst-Tid. 57(5):101-105.

Data collected in 1954-1955 and 1967-1968 from California counting stations are used to determine fluctuations in the number of migrating whales. Fewer whales are sighted during the middle of the day than either in the morning or evening.

Rasmussen, R.A., and N.E. Head.

1965. The quiet gray whale (Eschrichtius robustus). Deep Sea Res. 12(6):869-877.

Author's abstract: "Studies conducted during the period December 22, 1964 - March 7, 1965 near San Diego, California and at several locations in Baja California failed to confirm the use of acoustic signals by the gray whale. It is concluded that this cetacean rarely transmits subsurface sounds, and that it utilizes methods other than echolocation for navigation in shallower areas during the day."

Ray, Dorothy Jean.
1975. The Eskimos of Bering Strait, 1650-1898. Univ. Washington Press, Seattle, Washington. 305 p.

This scholarly account treats the Eskimos of the area of Seward Peninsula and southward to the southern coast of Norton Sound. Tribal organization and political organization of traditional Eskimo culture are reconstructed from eighteenth and nineteenth century reports and author's field notes. Descriptions of Eskimo subsistence include various information about sea mammals. Walrus arrived in early part of May, largest number being killed in June, they being harder to kill in fall. Wales was reported to have taken 600-700 walrus annually before commercial whaling began (mid-1800's). In 1890, 322 walrus were taken at Wales. The writings of the first white teachers at Wales contain the following records of Eskimo bowhead whaling at Wales: 1888 - one whale taken; 1889 - 3 taken, 12 struck and lost; 1890 - 0 taken, 2 struck and lost; 1891 - one taken, 29 struck and lost; 1895 - 0 taken. Good hunting areas for bearded seals were Tapkak stretch near Shishmaref; around Sledge and King Islands; the mouth of the Solomon River; and in Port Clarence. Beluga whales were caught in shallow water where they were chased toward land by men in kayaks and speared. "The best known beluga shallows were Eschscholtz Bay, at Koyuk, at Inglutalik in Golovin Bay and near Pastolik.... Cape Nome long ago was supposed to have been a rich beluga area, and an old village there, still occupied during the gold rush days, was called Setuk (seto'ak) or 'white whale.' (Another beluga shallows on the north shore of Kotzebue Sound is called 'Sheshalik', from 'sesualik', meaning 'where there are white whales.')" The seal was the most important sea mammal to almost all Eskimos. "In the 1890's, the Wales Eskimos annually captured between four and five thousand 'common seals,' besides a few other species, between 15 September and 15 June by shooting or netting, usually through the ice." Beluga and spotted seals were netted near the mouth of Tuksuk Channel (Grantley Harbor). Shaktoolik Eskimos went at all times of the year to Besboro Island for spotted seals. Seal hunting was conducted at Stuart Island, Pt. Spencer, and Atnuk. At Kikiktuak seals were caught in nets during July and September. 5 maps, 28 photos and drawings.

Ray. G. Carleton.
In press. Conservation of marine mammals. Science in Alaska, Proc. 29th Alaska Sci. Conf., Fairbanks, Alaska, August 15-17, 1978, 7 p.

Walrus serves as an illustrative example of "systems analytic modelling" which involves mapping and overlay techniques and aims to provide an objective overall view of the schedules and activities of man and of nature in a given realm. Areas of interference can be identified and an appreciation gained of what may be involved in making the doings of man and of nature compatible. Agencies with jurisdictions over the various aspects of a system are taken into account. The need for information about natural history, ecology, and behavior of marine mammals for intelligent management and conservation is emphasized. 1 ref.

Ray, G. Carleton, and Douglas Wartzok.
1977. Insights into the natural history of the Pacific walrus. Abstr. only. in Proc. (abstracts), Second Conf. Biol. Mar. Mammals, San Diego, California, 12-15 December 1977, p. 22. (Avail. from first author, Dep. of Pathobiol., The Johns Hopkins Univ., 615 Wolfe St., Baltimore, MD 21205.)

Team conducted behavioral and ecological studies in the Chukchi Sea 10-31 July, remaining with one "focal group" of 1,000-2,000 animals continuously for 12 days. Pattern of dispersal and reassociation was discerned. Benthic feeding area of "focal group" was calculated at 500 square nautical miles. Polar bear predation on walrus was observed and judged to be possibly a significant factor in mortality of young. Behavioral and ecological research is advocated for walrus and other ice-inhabiting marine mammals.

Ray, G. Carleton, and W.A. Watkins.
1975. Social function of underwater sounds in the walrus Odobenus rosmarus. In K. Ronald and A.W. Mansfield (eds.), Biology of the seal. Rapp. P.-v. Réun. Cons. int. Explor. Mer 169:524-526.

Observations were made from the ice 30-70 nautical miles south of St. Lawrence Island in the Bering Sea, on 8-10 March 1972. From conclusion: "Male walruses exhibit a display pattern in the vicinity of mixed herds of cows, subadults, and young at the time of year when courtship and reproductive behavior are presumably at ther height. The acoustical portion of the display ... fits the ... criteria of a "song" as used to described animal sounds: stereotyped and repetitive, seasonally produced (though part of this "song" may be heard through May or later), apparently sexually distinctive, and with territorial and courtship functions. The function of the sounds described appears to be primarily in advertising the presence of a bull in breeding condition and perhaps the establishment of an underwater territory or dominance hierarchy as well." 3 fig., 5 ref.

Ray, P.H.
1885. "Narrative" and "Ethnographic sketch of the natives of Pt. Barrow." P. 19-88 in Report of the international polar expedition to Point Barrow, Alaska. Govt. Print. Office, Washington, D.C.

Author's party lived just southwest of Point Barrow from 8 September 1881 to 29 August 1883. "Narrative" notes previous history of white men at Pt. Barrow, recounts entire expedition including voyages to and from Pt. Barrow, recounts seasonal appearances of birds and marine mammals, encounters with whaling ships, weather, a week's trek inland, etc. "Ethnographic Sketch" describes general human ecology, technology, and social characteristics of Pt. Barrow Eskimos. Population declined by more than 1/3 since the 1850's. Seals a mainstay of diet. "Over one hundred [mostly ringed] seal are sometimes taken at a single air-hole within twenty-four hours..."; however, seals occasionally desert the area for a season. Twenty-four bowhead whales were taken during 2 or 3 years in the early 1850's whereas only 2 were taken during the 1882 and 1883 whaling seasons. American whalers had greatly reduced bowhead numbers during the previous 20 years.

Reeves, Randall.
1977. The walrus not exactly thriving. North 24(4):2-5.

History and present status of the species Odobenus rosmarus are discussed. Four stocks are: (1) Pacific walrus, O. r. divergens, numbering perhaps 130,000-140,000, principally in the Bering and Chukchi Seas; (2) Atlantic walrus, O. r. rosmarus, numbering about 10,000 in the Canadian arctic, (3) Atlantic walrus in the northeast Atlantic and Barents and Kara Seas (north of Russia), especially Franz Josef Land, numbering in the hundreds, and (4) Laptev walrus, O. r. laptevi, numbering at least 3,000 in the Laptev Sea, north of central Siberia. Management, protection, and threats to the species are emphasized.

Reilly, Stephen B.
1978. Pilot whale. P. 112-119 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

Rice, Dale W.
1963. Pacific coast whaling and whale research. Trans. 28th North Am. Wildl. Nat. Resour. Conf.:327-335. Wildl. Manage. Inst., Washington, D.C.

Complete catch data (1956-1962) from the 3 U.S. whaling stations is tabulated. The average annual catch was less than 300 whales, which was less than 3% of the total North Pacific catch. Hunting from the two San Francisco Bay stations was conducted in the area within about 125 nautical miles of the Golden Gate. The third station, in Oregon, had taken only 6 whales. In descending order of total numbers caught, whales were: humpback. fin, sperm, sei, blue, and giant bottlenose. Relevant characteristics of each species (e.g. usual distance from shore) are noted. Captures and flensing described; quantity and value of whale products tabulated. Current research on large whales in North Pacific outlined. 2 tab., 2 fig.

1965. Synopsis of the biology and history of the gray whale. Unpubl. manuscr., 14 p. U.S. Dep. Inter., U.S. Fish Wildl. Serv., Mar. Mammal Biol. Lab., Seattle, Washington.

A synopsis offering information on distribution, migration, life history and ecology of the gray whale. Appendix recommends further research topics. Population size estimated at 6,000 in 1959-1960, with a rate of increase of 10% per year. From June to October gray whales are found in the northern Bering Sea and Chukchi Sea from the mouth of the Yukon River north to Wrangel Island and Point Barrow.

1968. Stomach contents and feeding behavior of killer whales in the eastern North Pacific. Norsk Hvalfangst-Tid. 57(2):35-38.

Remains of California sea lions, Steller sea lions, elephant seals, harbor porpoises, Dall porpoises, minke whale, opah (Lampris regius), Pacific halibut, carcharinid sharks, and squid were found in the stomachs of 10 killer whales collected between Kodiak Island, Alaska, and San Miguel Island, California. In Puget Sound, marine mammal populations are too small to support killer whale population, so fish proportion of diet is undoubtedly larger than elsewhere on the Pacific coast.

1974a. 1972-73 studies on the gray whale by the National Marine Fisheries Service. Rep. Int. Comm. Whaling 24:177-184.

Population was estimated by shore censuses at about 11,000, which may be close to the original size of the eastern Pacific stock. Low altitude light plane observations confirm that a negligible number of whales pass too far from shore to be observed by shore counters at Yankee Point, and that shore counters are probably correct in their estimates of pod sizes. Remote sensing was carried out at high altitude on 23 January 1973. The four remote sensor systems tried are listed in detail. Only the RC-8 aerial camera using 9x9 in. aerial color film at 2,000 ft. altitude proved useful for locating gray whales.

1974b. Whales and whale research in the eastern North Pacific. P. 170-195 in W.E. Schevill (ed.), The whale problem, Harvard Univ. Press, Cambridge, Mass.

The 11 large cetaceans of the eastern North Pacific are discussed, with particular regard to distribution and population. Five of the species are considered endangered; their populations are estimated as follows: black right, a few dozen; humpback, a few hundred; blue, 2,000; bowhead, a few thousand; gray. 11,000. Three species are being commercially harvested under the jurisdiction of the International Whaling Commission. Their estimated numbers: fin, 9,000 recruited; sei, 28,000 recruited; sperm, several hundred thousand. Bryde's, minke, and giant bottlenose whales have unknown population sizes and are unexploited. Population data are summarized from catch statistics and other authors.

1975. Status of the eastern Pacific (California) stock of the gray whale. Food Agric. Organ. U.N., Adv. Comm. Mar. Resour. Res. ACMRR/MM/SC/14, 9 p.

Gives review of distribution, reproduction and exploitation of gray whale. Notes population size change from 1846. Present population has remained stable at about 11,000 ($\pm$ 2,000) for the past 8 years.

1977a. A list of the marine mammals of the world. U.S. Dep. Commer., NOAA Tech. Rep. NMFS SSRF-711, 15 p.

Author's abstract: "Listed are the 116 species of recent marine mammals, including freshwater species of the predominantly marine groups. The numbers of species are: Order Carnivora--36 (polar bear, sea otter and 34 pinnipeds); Order Sirenia--5; Order Mysticeti--10, and Order Odontoceti--65. The geographic distribution of each species is indicated."

1977b. Synopsis of biological data on the sei whale and the Bryde's whale in the eastern North Pacific. Rep. Int. Whaling Comm., Special Issue 1 - Rep. Spec. Meet. Sci. Comm. Sei and Bryde's whales, La Jolla, California, December 1974, p. 92-97.

Draws on data from 284 sei whales captured from 1959-1970, data from whale marking cruises in 1962-1971 off Mexico and California, and California catch statistics from 1956-1971. Sei whales: The dominant food varied seasonally. From June to August, northern anchovy (Engraulis mordax) predominated; in September to October the major catch was a krill (Euphausia pacifica). They are also known to feed on sauries and jack mackerel as well as copepods. High incidence of a disease resulting in shedding of baleen plates was found in sei whales. Reproductive cycles are given. Parasites listed. Bryde's whales: Are found year-round from 26°12'N to 21°N; have been observed feeding on the red crab (Pleuroncodes planipes) and on anchovies.

1978a. Beaked whales. P. 88-95 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

1978b. Blue whale. P. 30-35 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

1978c. Gray whale. P. 54-61 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

1978d. Sperm whales. P. 82-87 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

Rice, Dale W., and Allen A. Wolman.

1969. Progress report on gray whale studies. Unpubl. manuscr., submitted to Int. Whaling Comm., 19 p. U.S. Fish Wildl. Serv., Mar. Mammal Biol. Lab., Seattle, Wash.

Whale counts were made from Point Loma and Yankee Point, California, for 10 hours a day. Extrapolations were made for night migration, poor visibility and offshore migration. Estimated population for 1968-69 was 10,000 animals.

1971. Life history and ecology of the gray whale, Eschrichtius robustus. Am. Soc. Mammal. Spec. Publ. No. 3. 142 p.

Monographic account of existing knowledge, incorporating results of authors' research, 1959-1970, which involved collection of 316 gray whales, mostly from California. Offers good descriptions of methods currently used in biological research on large whales (with exception of marking). Includes food and feeding, predators, parasites, etc. From late May to October gray whales can be found in the northwest Bering Sea, and in the Chukchi Sea as far north as 69°N. Along the northern Alaska coast, they are found from Cape Thompson to Point Barrow. A few have been seen in the Beaufort Sea as far east as Barter Island. A few animals can be found south of the Yukon Delta down the coast. 48 tab., 38 fig., 172 ref.

Robbins, L.L., F.K. Oldham, and E.M. Geiling.
1937. The stomach contents of sperm whales caught off the west coast of British Columbia. Rep. British Columbia Mus. 1937:19-20.

The stomachs of whales caught in 1936 and 1937 off Queen Charlotte Islands were examined. The most common fish was the rag-fish (Acrotus willoughby) [=Icoteus aenigmaticus], a deep sea animal. Another food item of importance was a species of giant squid (possibly Moroteuthis robusta). Sperm whales frequent the area off Rose Harbor, Queen Charlotte Islands, from the end of May until mid-September, with the greatest abundance in July and August.

Roest, A.I., R.M. Storm, and P.C. Dumas.
1953. Cuvier's beaked whale (Ziphius cavirostris) from Oregon. J. Mammal. 35(2):251-252.

On 21 February 1952 a Cuvier's beaked whale was found on the beach at Roads End, north of Oceanlake, Oregon. Measurements given.

Roppel, Alton Y., and Stuart P. Davey.
1965. Evolution of fur seal management on the Pribilof Islands. J. Wildl. Manage. 29:448-463.

Management of the northern fur seal (Callorhinus ursinus) and development of techniques (from indiscriminate killing to present day harvesting of specific sex and age groups) are traced.

Roppel, Alton Y., Ancel M. Johnson, Raymond E. Anas, and Douglas G. Chapman.
1965. Fur seal investigations, Pribilof Islands, 1964. U.S. Fish Wildl. Serv., Spec. Sci. Rep. Fish. 502, 46 p.

In 1964, 48,980 male seals and 16,452 females were killed. Majority of males killed were age 3. Predicted kills of certain age classes were compared with actual kills. Reproductive studies were conducted. Skins were collected for experimentation relating economic value to age and sex. Tagging program continued. Pup mortality was investigated. Tagged pups weighed consistently less than untagged pups.

1966. Fur seal investigations, Pribilof Islands, Alaska, 1965. U.S. Fish Wildl. Serv., Spec. Sci. Rep. Fish. 536, 45 p.

In 1965, 40,367 male seals, mostly ages 3 and 4, and 10,432 females, mostly ages 2 to 5, were killed. Females under 5 were usually not impregnated. Theoretically predicted kills for different age classes are compared with actual kills. Larger, older males were also killed to test the commercial value of their skins. Pup mortality was investigated. Tagging continued, and results are discussed at length. Male kills for 1966 are predicted. Female seals will not be intentionally killed in 1966.

Roppel, Alton Y., Ancel M. Johnson, Richard D. Bauer, Douglas G. Chapman, and Ford Wilke.
1963. Fur seal investigations, Pribilof Islands, Alaska, 1962. U.S. Fish Wildl. Serv., Spec. Sci. Rep. Fish. 454, 101 p.

A description of research activities in 1962 is presented. Numbers and year classes of seals harvested from 2 July to 19 September are given. Data includes estimates on males, females, pups, tags and tag recovery; mortality; parasites.

Roppel, Alton Y., Ancel M. Johnson, and Douglas G. Chapman.
1965. Fur seal investigations, Pribilof Islands, Alaska, 1963. U.S. Fish Wildl. Serv., Spec. Sci. Rep. Fish. 497, 60 p.

In the summer of 1963, 42,386 male seals and 43,952 females were killed. Ninety percent of males killed were 3 and 4 years of age. Reproductive studies were conducted. Tagging program was continued. Pup mortality is discussed. Tagged pups weighed consistently less than untagged pups.

Rovnin, A.A.
1968. Vstrechi kotikov Tikhom okeane (Frequency of occurrence of fur seals in the Pacific). Tr. Vses. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (VNIRO) 68 (Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 62):87-88. In Russian. (Transl. by Israel Program Sci. Transl., 1971, p. 83-84 in V.A. Arsen'ev and K.I. Panin (eds.), Pinnipeds of the North Pacific, avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 70-54020.)

Sightings of fur seals north of the Hawaiian Islands in March of 1966. There were 11 sightings in 6 days between latitudes 37°06'N and 39°06'N.

Rugh, David J., and Howard W. Braham.
In press. California gray whale (Eschrichtius robustus) fall migration through Unimak Pass, Alaska, 1977 [SC/30/Doc 46]. Rep. Int. Whaling Comm. 29. 20 p. + 3 fig.

From abstract: "California gray whales were censused from 20 November to 9 December 1977 as they passed Cape Sarichef, Unimak Island, Alaska, on their fall migration out of the Bering Sea. During 82.5 hours of systematic observation, 2,055 southbound whales were counted." By extrapolation from this count, it was estimated that 15,099 ±2,341 gray whales left the Bering Sea through Unimak Pass. 2 tab., 3 fig.

Ruud, J.T.
1956. The blue whale. Sci. Am. 195:46-50.

A general treatment of the blue whale which briefly discusses taxonomy, whaling methods and biology. Migration patterns are unknown, but the whales congregate in polar regions in the summer to feed.

Saario, Doris J., and Brina Kessel.
1966. Human ecological investigations at Kivalina. P. 969-1039 in N.J. Wilimovsky (ed.), Environment of the Cape Thompson region, Alaska, U.S. Atomic Energy Comm. (Avail. Natl. Tech. Inform. Serv., Springfield, Va.)

Describes seasons and ice conditions in which ringed seals and bearded seals occur. Eskimo take of these two species is tabulated by month from September 1959 to April 1961. Ringed seals begin to be seen in late October or early November. Peak occurrence is in February. In March, seals bask and can be taken on the ice. Also in March, bearded seals (ugruks) begin to appear with regularity. In May and June seals are found on large pan ice or floes, and they continue here until late June or early July, when ice is blown out to sea. Peak of ugruk hunting is in May and June. Beluga whales appear in March or April, just preceding bowhead whales; beluga kill (estimated) is tabulated for 1955-1960. Bowhead whaling was instituted in 1960, but none had yet been taken. Dead walrus are regularly found; seldom live animals. Appendix gives specimen data for 35 bearded seals and 34 ringed seals. Investigation covered a 22-month period from August 1959 to May 1961, and considered social structure and means of subsistence of Eskimos at Kivalina. 8 photos.

Sakiura, H., K. Ozaki, and K. Fujino.
1953. Biological investigation of the Northern Pacific baleen whales caught by the Japanese whaling fleet in 1952. Fish. Agency Jpn. Gov., issued by Jpn. Whaling Assoc., printed by Kokusai Bunken Insatsusha, Chiyoda-ku, Tokyo, Japan. 64 p.

Fifty-five blue, 213 fin, 37 humpback and 14 sei whales were caught from July to September 1952, in the North Pacific south of the Aleutians. Observations of external characters, external parasites, white scars, blubber thickness, mammary glands, foetus, stomach contents, genitalia condition and body measurements were recorded. The primary food items for blue, fin and humpback whales included Thysanoessa and Calanus. Sei whales consumed mainly squid and saury. 12 tab., 21 fig., 22 ref.

Sampson, W.F.
1970. Stenella coeruloealba in the northern Pacific Ocean. J. Mammal. 51(4):809.

Reported range is from the Bering Sea to southern California. In August of 1969, about 12 animals were seen at 34°N, 138°W (1,000 miles west of Los Angeles). This is the first report of the species in the open sea of the northern Pacific.

Sandegren, Finn.
1975. Sexual-agonistic signalling and territoriality in the Steller sea lion (Eumetopias jubatus). In K. Ronald and A.W. Mansfield (eds.), Biology of the seal. Rapp. P.-v. Réun. Cons. int. Explor. Mer 169:195-204.

About 3,000 hours of observation were carried out on Lewis Island, Gulf of Alaska, in summers of 1967-1969, and on Año Nuevo Island, north of Santa Cruz, California, in summers of 1970 and 1971. Author describes "display" of the female, analyzing components of the display. Female display does not always lead immediately to copulation, but occurs in several situations, both before and after copulation. Male response to display discussed. Functions of various components of display are considered and compared with other species of pinnipeds. Author hypothesizes that display serves to synchronize breeding cycles of male and female. 11 photos, 2 graphs.

Sandegren, Finn E., Ellen W. Chu, and Judson E. Vandevere.
1973. Maternal behavior in the California sea otter. J. Mammal. 54(3):668-679.

Females with young were observed for a total of 300 hours, from Point Lobos to Lucia, California. Behavior is broken down into nursing, grooming young, grooming selves, feeding, swimming, and resting. Includes description of parturition, and sonograms of vocalizations between mother and pup. Describes swimming, aggression, feeding, and nursing-suckling.

Scammon, Charles M.
1870. Sea otters. Overland Monthly 4(1):25-30.

Describes appearance and behavior of sea otters. Notes distribution from Lower California to Washington in some detail. Alaskan distribution noted as abundant in the Aleutian Islands and Fox Islands. Describes methods of hunting sea otters used by Indians and whites. [Also found in Am. Nat. 4(2):65-74.]

1871. About sea-lions. Overland Monthly 9(3):266-272.

Describes several varieties of pinnipeds, including "Eumetopias stelleri, which inhabits the coasts and islands of the North Pacific, from California and southern Kamtchatka northward..." [It may be that Scammon thought of northern (Steller) and California sea lions as one species.] Describes annual drive of sea lions and their utilization by Aleuts on St. Paul Island, Pribilof Islands. Also describes ice-sealing and "net-sealing".

1872. The orca. Overland Monthly 9(1):52-57.

Brief article. Notes presence in Bering Sea and into Arctic Ocean. Mentions predation on gray whale, beluga whale and walrus calves. Mentions occasional taking by Makah Indians of Cape Flattery, Washington.

1874. The marine mammals of the northwestern coast of North America. John H. Carmany and Co., San Francisco, 320+v p., illus., 30cm. [Reprinted 1968, Dover Publications, New York, 319 p. Facsimile edition, 1969, Manessier Publishing Co., Box 5517, Riverside, Calif. 92507, XLVI+320+v p., with Scammon's charts of Baja Calif. lagoons.]

Provides a description of 24 species of cetacea, 6 pinnipeds and the sea otter. The descriptions are general and of a behavioral nature, interspersed with hunting anecdotes. The volume provides an important contribution to the history of whaling.

Scattergood, L.W.
1949. Notes on the little piked whale. Murrelet 30(1):3-16.

Review article on the minke whale. Encompasses body measurements, world distribution, reproduction, food and taxonomy. Minke whales are commonly found along the North Pacific coast. Areas of lesser abundance are off the British Columbia coast and southeastern Alaska. The primary food items are thought to be fish in the northern waters. 89 ref.

Scheffer, Victor B.
1939. Organisms collected from whales in the Aleutian Islands. Murrelet 20(3):67-69.

"Three species of crustacea and one species of nematode were collected from sperm and humpback whales at the whaling station on Akutan Island, Alaska, August 6, 1938."

1942. A list of the marine mammals of the west coast of North America. Murrelet 23(2):42-47.

There are 43 species of marine mammals listed as inhabitants of the west coast, one of which is extinct (Steller sea cow).

1945. Growth and behavior of young sea lions. J. Mammal. 26(4):390-392.

Northern sea lions were observed seven times from 23 May to 7 August 1944 on St. Paul Island, Pribilof Islands. Pupping began 23 May and continued until 20 June. Sizes and weights of 11 pups are tabulated. Newborn pups averaged 38 lbs. and 979 mm. Six- to ten-week-old pups averaged 88 lbs, and 1,250 mm. Eleven or 12 teeth were erupted in newborns. Mating occurs in June. On 23 June a pup was observed "learning to swim". 1 photo.

1949a. Notes on 3 beaked whales from the Aleutian Islands. Pac. Sci. 3(4):353.

On 6 June 1947 a specimen of Ziphius cavirostris was found on Samalga Island. On 12 November 1947 a tooth from a species of Mesoplodon was found on Amchitka Island. A specimen of Berardius bairdii was stranded in the fall of 1948 near Unalaska.

1949b. The Dall porpoise, Phocoenoides dalli, in Alaska. J. Mammal. 30(2):116-121.

Reports on observations during two cruises in 1947 and 1948. Describes range in southern Bering Sea, Aleutian Island waters, Gulf of Alaska and southeast Alaska. No seasonality was observed. Anatomical measurements given for 5 specimens. Liver analyzed for vitamin A content. 2 pl.

1950a. Porpoises assembling in the North Pacific Ocean. Murrelet 31(1):16.

Two sightings are reported: (1) On 13 July 1949 at 43°N, 139°03'W, over 5,000 unidentified porpoises (6-8 feet long, black) were reported by ship's officer. (2) In summer, about 1920 or 1930, between Seward and Cape Spencer, several thousand porpoises (probably Phocoenoides dalli) were reported by a passenger on a commercial steamer.

1950b. The striped dolphin, Lagenorhynchus obliquidens (Gill, 1865), on the coast of North America. Am. Midl. Nat. 44(3):750-758.

The range off the North American coast is from Ballenas Bay, Mexico, to Valdez, Alaska. There are three records of the striped dolphin in Alaska: Valdez, June 1901; Montague Strait, September 1905, and Sitka, September 1895. Off the British Columbia coast there was one sighting in July 1901 in Hecate Strait. There are 8 records off the Washington coast. Also included are records of sightings off the coasts of California and Oregon, as well as a description of the dolphin. Food items found in specimens include sardines and large and small squid.

1951. Measurements of sea otters from western Alaska. J. Mammal. 32(1):10-14.

Skulls and some skins of 120 otters were assembled from 1947-49, all but 19 from Amchitka Island. Upper canine of the adult male is over 10mm wide and is consistently larger than adult female's, and thus a possible means of sexing unidentified skulls.

1953a. Measurements and stomach contents from eleven dephinids from the northeast Pacific. Murrelet 34(2):27-30.

The 11 animals examined included 1 Phocaena vomerina, 8 Phocoenoides dalli, 1 Lagenorhynchus obliquidens and 1 Stenella styx. The sole food item for the P. vomerina was capelin. P. dalli contained mostly squid, but hake, horse mackerel and capelin were also present. The Lagenorhynchus was found with squid remains and jellyfish. All the specimens except 3 P. dalli and L. obliquidens were taken north of 45°N.

1953b. Otters diving to a depth of sixty feet. J. Mammal. 34(2):255.

Notes a report of otters found in crab pots in Fish Bay and Deep Bay, Sitka, Alaska, at a depth of about 10 fathoms. Quotes one other reference to otters caught in crab pots.

1958. Seals, sea lions and walruses: a review of the Pinnipedia. Stanford Univ. Press, Stanford, California. 179 p.

Gives biological characteristics, species evolution, taxonomy and systematic account of the pinnipeds. World populations estimates offered by subspecies.

1960. A dolphin Stenella from Washington state. Murrelet 41(2):23.

In February 1960 a specimen of Stenella caeruleo-albus [sic] was received anonymously from an unknown locality. If the dolphin is from Washington waters, it represents the third record for the state.

1967. Alaskan seals and sea otters: a partial bibliography. Unpubl. manuscr., 7 p. U.S. Dep. Inter., U.S. Fish Wildl. Serv., Mar. Mammal Biol. Lab., Seattle, Wash.

Includes publications from 1955-1967 that deal with distribution and population of seals and sea otters in Alaskan waters as well as methods of capturing and restraining.

1972. Marine mammals in the Gulf of Alaska. P. 175-207 in Donald H. Rosenberg (ed.), A review of the oceanography and renewable resources of the northern Gulf of Alaska. Inst. Mar. Sci., Univ. Alaska, Fairbanks.

Discusses history of regulations, uses of marine mammals and threats to particular species. Population estimates are tabulated: sea otter - 5,000; sea lion - 40,000; fur seal - 20,000; harbor seal - 20,000; walrus - rare; sperm whale - 600; sei whale - 300; fin whale - 1,000; humpback - 20; gray whale - 1,100; blue whale - 120; right whale - 50; minke whale - 200; beluga whale - 350; killer whale - 100; harbor porpoise - 1,000; Dall porpoise - 2,000; right whale dolphin, pilot whale, white-sided dolphin and beaked whales - rare. Large whale estimates are rough; procedure used to arrive at them is explained. Smaller cetaceans are estimated mainly from miscellaneous records. 66 ref.

1977. Newborn harbor seals on the Pribilof Islands, Alaska. Murrelet 58(2):44.

Four specimens (collected 1944-1950) are described and other reports are reviewed. Conclusion: that harbor seal pups on the Pribilof Islands are born between mid-May and mid-July, weigh about 25-30 lb. (11-14kg), and are about 90cm long.

1978a. Conservation of marine mammals. P. 242-244 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

1978b. Killer whale. P. 120-127 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

Scheffer, V.B., and K.W. Kenyon.
1963. Elephant seal in Puget Sound, Washington. Murrelet 44(2):23-24.

On 21 April 1963 an adult male northern elephant seal was seen swimming in Puget Sound. The observers took motion pictures of the animal for positive identification. This is the first record from Washington state.

Scheffer, V.B., and J.W. Slipp.
1948. The whales and dolphins of Washington state with a key to the cetaceans of the west coast of North America. Am. Midl. Nat. 39(2):257-337.

Records sightings or strandings for each of the 20 species (13 odontocetes, 7 mysticetes) found in Washington waters. A key to cetaceans along the west coast is provided.

Scheffer, Victor B., and Ethel I. Todd.
1967. History of scientific study of the Alaskan fur seal, 1786-1964. Unpubl. manuscr., 377 p. U.S. Fish Wildl. Serv., Bur. Commer. Fish., Mar. Mammal Biol. Lab., Seattle, Wash. [This work is currently in preparation for publication.]

The period is subdivided into the following parts: Russian period, 1786-1867; the interregnum, 1868-1869; Alaska Commercial Co., 1870-1889; North American Commercial Co. and the first international treaty, 1890-1909; transition years, 1910-1911; the period of population recovery, 1912-1939; the modern period, 1940-1964. "Literature cited" section consists of 84 pages and over 400 references.

Scheffer, V.B., and Ford Wilke.
1950. Validity of the subspecies Enhydra lutris nereis, the southern sea otter. J. Wash. Acad. Sci. 40(8):269-272.

Authors examined 56 specimens and conclude that "neither on the basis of demonstrable variation nor on the grounds of geographical isolation is there support for a southern subspecies of the sea otter."

Schiller, Everett L., and Robert Rausch.
1956. Mammals of the Katmai National Monument, Alaska. Arctic 9(3):191-201.

Information on occurrence and distribution of mammals, obtained in summer 1953 at Katmai National Monument. Survey areas included the Shelikof Strait, where harbour seals were common (especially in Kukak, Katmai and Portage Bays). The carcass of a young male northern fur seal washed ashore in May 1954 at Kanatak. Two carcasses of Steller's sea lions were found on the beach at Kukak Bay in July 1953.

Schneider, Karl B., and James B. Faro.
1975. Effects of sea ice on sea otters (Enhydra lutris). J. Mammal. 56(1):91-101.

Discusses offshore sea otter population in southern Bristol Bay during the winters of 1971 and 1972, when ice penetrated unusually far south along the Alaska Peninsula. Otter mortality in 1971 is estimated at at least 200. Mortality in 1972, when the onset of ice was not so sudden, was apparently negligible. Aerial surveys were made in March of both years along the north shore of the Alaska Peninsula. Authors also note expansion of known range of sea otters northeastward to Port Heiden by 1970.

Scott, R.F., K.W. Kenyon, J.L. Buckley, and S.T. Olson.
1959. Status and management of the polar bear and Pacific walrus. Trans. 24th North Am. Wildl. Conf.:366. Wildl. Manage. Inst., Washington, D.C.

From the number of bears sighted per flying hour, the Alaskan population was calculated by Tovey and Scott, 1957, to be 2,000-2,500. Walruses are said to number 45,000. Half of the walrus killed are thought to be lost through non-recovery. Mortality is estimated at twice the recruitment.

Sergeant, D.E., and P.F. Brodie.
1969. Body size in white whales, Delphinapterus leucas. J. Fish. Res. Board Can. 26:2561-2580.

Authors' abstract: "Measurements of length, girth, and weight show that male white whales grow larger than females. The smallest white whales come from western Hudson Bay, the White Sea, and Bristol Bay, Alaska. Animals of intermediate size inhabit all other arctic Canadian localities sampled and also the St. Lawrence River and the Kara and Barents seas. The largest white whales inhabit West Greenland waters, the Okhotsk Sea, and the coast of Sakhalin. Extreme differences in body weight of adult males are about threefold. Nonoverlapping differences in size indicate isolation of some adjacent populations of white whales; equal or overlapping sizes suggest, but cannot prove mixing of other populations. Size can be positively correlated with marine productivity, being lowest in the arctic and in estuaries and highest in subarctic seas. Since white whales most often grow largest at the southern ends of their range, their restriction to the arctic is attributed either to competition with certain of the Delphinidae or to predation from killer whales, Orcinus orca L., or to both. Both putative competitors and predators lack adaptations for arctic life."

1975. Identity, abundance, and present status of populations of white whales, Delphinapterus leucas, in North America. J. Fish. Res. Board Can. 32:1047-1054.

"White whales, Delphinapterus leucas, in the North American arctic number at least 30,000 animals. Largest herds identified are about 10,000 animals in western Hudson Bay, at least as many in Lancaster Sound, and at least 5000 summering in the Beaufort Sea." Around Alaska, white whales are found in Cook Inlet (150-300) and Bristol Bay (1,000-1,500), with greater numbers further north. 2 tab., 3 fig.

Sergeant, D.E., and W. Hoek.
1974. Seasonal distribution of bowhead and white whales in the eastern Beaufort Sea. P. 705-719 in J.C. Reed and J.E. Sater (eds.), The coast and shelf of the Beaufort Sea, Arctic Inst. North Am., Arlington, Va.

Authors' abstract: "Bowhead (Balaena mysticetus) and white whales (Delphinapterus leucas) migrate into the eastern Beaufort Sea from the west, arriving in May or June through leads in the pack ice. They depart westward again during September in open water. Present numbers of bowheads are not accurately known, but are probably in the low hundreds in this sector of the species' range. Groups of up to thirty have been seen on migration. Numbers of white whales are at least 3,500. Bowheads

spend the summer in oceanic water around Banks Island and off the mainland coast in the neighborhood of Cape Parry and Cape Bathurst. Many white whales are found in the same waters, but in July they move to the warm estuarine water off the Mackenzie River where calving is believed to occur and where feeding intensity is low. There is a hunt for white whales off the Mackenzie delta which for many years has taken an average of about 200 animals per year, but bowheads are not now taken from the Canadian coast of the Beaufort Sea." 1 tab., 9 fig., 13 ref.

Shaughnessy, P.D.
1975. Biochemical comparison of the harbor seals Phoca vitulina richardi and P. v. largha. In K. Ronald and A.W. Mansfield (eds.), Biology of the seal. Rapp. P.-v. Réun. Cons. int. Explor. Mer 169:70-73.

Blood samples from 126 Phoca vitulina richardi (from California, Washington, and Alaska) and 56 P. v. largha seals (from the Bering Sea) were analyzed. Similarity of proteins in the two groups suggests that (a) there is still genetic interchange or (b) separation was recent. Genetic homogeneity in all groups suggests past decimation of stock or the possibility that they are descended from a small number of colonizers from Atlantic stock.

Sherrod, Steve K., James A. Estes, and Clayton M. White.
1975. Depredation of sea otter pups by bald eagles at Amchitka Island, Alaska. J. Mammal. 56(3):701-703.

Three observations are given of eagles taking live pups from the water. Based on eagle nest contents (tabulated for 1969-1973), eagle predation on otter pups is variable.

Shurunov, N.A.
1970. Nekotorye gidrologicheskie kharakteristiki raionov kontsentratsii kitov v severo-vostochnoi chasti Tikhogo Okeana, Beringovom i Chukotskom moryakh (Some hydrological characteristics of whale grounds in the northeastern Pacific and Bering and Chukchi Seas). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 72:89-92. In Russian. (Transl. by Israel Program Sci. Transl., 1972, p. 83-86 in P.A. Moiseev (ed.), Soviet fisheries investigations in the northeastern Pacific, Pt. 5, avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 71-50127.)

Surveys were conducted on two vessels in 1962 along the Pacific side of the Aleutian Islands east of 170°W, and the western part of the Gulf of Alaska, to the Kenai Peninsula; the southeastern Bering Sea; the northern Bering Sea and the southern Chukchi Sea. It appears that whales form feeding concentrations in regions of contact between bodies of water of different characteristics. Hydrological information on the southeastern Bering Sea is from July; that on northern Bering and southern Chukchi is from July-August. In mid-March 1961, finbacks and sperm whales arrived in the western Gulf of Alaska and eastern Aleutian Islands waters. In about June, sei whales arrived. Concentrations of gray whales were noted in northern Bering Sea and southern Chukchi Seas.

Shustov, A.P.

1965a. Nekotorye cherty biologii i temp razmnozheniya krylatki (Some biological features and reproductive rates of the ribbon seal (Histriophoca fasciata) in Bering Sea). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 59:183-192. (Transl. by U.S. Dep. Inter., Bur. Commer. Fish., Seattle, Wash., 1968, 17 p.)

Biological specimens were taken from 1,567 ribbon seals collected from Anadyr Inlet and in the area from St. Matthew Island to the Pribilof Islands from 1961 to 1963. From examination of sexual organs of both sexes, mating time was determined to be from the end of April through the beginning of May. Parturition occurred from the end of March through the end of April. Claw layers were used to determine age. Most females attained sexual maturity at age 2-3 and most males at age 4. Life-span remains unknown; the oldest animal examined was 26 years old. Author states that ribbon seals do not form permanent unions and assumes that one male may impregnate several females. Includes detailed discussion of appearance and size of Graafian follicles and yellow bodies in the ovary, and the reproductive conditions inferred from them.

1965b. O vliyanii promysla na sostoyanie beringomorskoi populyatsii krylatki (The effect of sealing on the state of the population of Bering Sea ribbon seals). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 59:173-178. In Russian. (Transl. by U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Mar. Mammal Div., Seattle, Wash., 11 p.)

This study was undertaken from 1960-1963, Anadyr Gulf to St. Lawrence Island. The ages of the harvested seals were determined by the dentine layers on the teeth and horny layer on the claws. Because ribbon seals are easy to hunt, their population had dropped by 1964, and it became uneconomical to hunt them over most of the Bering Sea. In addition to a population reduction, there was a clear tendency towards juvenescence in the schools after 1962. This changes the reproductive rate of the population.

1965c. Pitanie krylatki v Beringovom more (The food of ribbon seal in Bering Sea). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 59:178-183. In Russian. (Transl. by U.S. Dep. Inter., Bur. Commer. Fish., Seattle, Wash., 1968, 10 p.)

The stomachs of ribbon seals collected in the Bering Sea during the springs of 1961-1963 were analyzed. Males and females show no difference in feeding, and they feed regularly during ice rookery formation. Shrimps, crabs, and mysids were found with the greatest frequency in the seal stomachs with various fish and cephalopods of lesser importance. The majority of food was from the nektobenthos. The water depth where the seals were harvested was 60-100 m. Since the ocean bottom, and thus the food supply, is accessible to the ribbon seal in the Bering Sea, distribution is probably governed by presence of ice formations suitable for rookeries.

1965d. Raspredeleniye krylatki v beringovom more (The distribution of ribbon seal (Histriophoca fasciata) in the Bering Sea). P. 118-121 in E.N. Pavlovskii, B.A. Zenkovich, S.E. Kleinenberg, and K.K. Chapskii (eds.), Morskiye mlekopitayushchiye, Izd. "Pishch. Prom.", Moscow. In Russian. (Transl. by U.S. Nav. Oceanogr. Off., Washington, D.C., 1970, Transl. 474, 6 p.)

Information gathered by sealing and research ships in the springs of 1961 and 1962 was combined with other reports. Ribbon seals occur in the Bering Sea from the beginning of November until mid-July, where they are found mostly along the ice edge, and occasionally as far as 30-40 miles back from the edge of the ice. Animals were seen as far south as Cape Goven(a) in Olyutorskiy Gulf (mid-February) and east of the Pribilof Islands (April). Concentrations formed in St. Matthew Island area in early March. Pupping was observed 29 March - 27 April; breeding occurs around May; molting has often begun by that time. In the second half of May, concentrations were noted on three large ice fields; (1) northern Gulf of Anadyr, (2) south of St. Matthew Island (where ribbon seals were outnumbered by harbor seals), and (3) southeast of King Island. Density of seals increases with increasing concentration of ice. From July to November distribution is poorly known. Seals may inhabit the permanent ice edge north of Alaska. Single seals do occur on northeastern side of Chukchi Peninsula from November to July. Author concludes that Okhotsk and Bering populations are separate.

1967. K voprosu o ratsional'nom ispol'zovanii zapasov lastonogikh beringova morya (Rational utilization of the populations of Pinnipedia in the Bering Sea). Probl. Severa 11:182-185. In Russian. (Transl., 1968, in Problems of the North 11:219-224, Natl. Res. Council, Ottawa, Can.)

Relative abundance of ribbon, larga and bearded seals in the Bering Sea noted. Hunting methods and times given for each species.

1969. Opyt kolichestvennogo aerovizual'nogo ucheta tiulenei v severo-zapadnoi chasti Beringova moria (Experiments in quantitative aero-visual survey of seals in the northwestern part of the Bering Sea). P. 111-116 in V.A. Arseniev, B.A. Zenkovich, and K.K. Chapskii (eds.), Morskie mlekopitayushchie (Marine mammals) [a collection of articles containing materials from the 3rd All-Union Conf. on Marine Mammals], Akad. Nauk SSSR, Min. Rybn. Khoz. SSSR, Ikhtiol. Kom., Izd. "Nauka", Moscow. In Russian. (Transl. by Fish. Res. Board Can., 1970, Transl. Ser. 1510, summary only.)

Article discusses methods of aerial surveying in detail. Information is given about the placement of seals depending on the type of ice and approximate numbers of those species seen. Concludes that ribbon seal population has decreased. 2 tab., 10 ref.

1972. O sostoyanii zapasov i raspredelenii nastoyashchikh tyulenei i morzha v severnoi patsifike (On the condition of the stocks and the distribution of true seals, and walruses in the North Pacific). P. 146-147 in Tezisy Dokladov Pyatogo Vsesoyuznogo Soveshchaniya po Izucheniyu Morskikh Mlekopitayushchikh (Abstr. Papers 5th All-Union Conf. Studies Mar. Mammals) 19-21 Sept., 1972, Makhachkala. Makhachkala: Minist. Rybn. Khoz. SSSR, Ikhtiol. Kom. VNIRO, KaspNIRKh, Akad. Nauk SSSR, Zool. Inst., Inst. Evol. Morfol. Ekol. Zhivotn. im. A.N. Severtsova, Inst. Biol. Razvit. In Russian. (Transl. by F.H. Fay, Univ. Alaska, Fairbanks, 1974, 2 p.)

Centers of species concentrations remain fairly stable over the years. Local redistributions occur with yearly variations in ice cover. Aerial surveys in 1964 and 1968 show reduction in ribbon seals in the Bering Sea. Other ice seal populations remain stable. From aerial surveys in 1969 and 1970, populations are estimated. Bering Sea: ringed seal - 50,000; larga - 135,000; bearded seal - 90,000; ribbon seal - 60,000; walrus - 101,000. Okhotsk Sea: ringed seal - 800,000; larga seal - 130,000; bearded seal - 180,000· ribbon seal - 140,000. After 10-year protection, walrus stock has increased from 50,000 to 101,000-103,000.

Sleptsov, M.M.

1955. Biologiya i promysel kitov dalnevostochnykh morei (Biology of whales and the whaling fishery in Far Eastern seas). "Pishch. Prom.", Moscow. In Russian. (Transl. by Fish. Res. Board Can., Transl. Ser. 118, 6 p. Contents and conclusions only.)

Contains species composition of cetaceans in far eastern seas and in the northwestern part of the Pacific Ocean; food of whales; studies of the regions in which whales feed; distribution of Cetacea; migrations of whales; reproduction of toothed and whalebone whales; analysis of dynamics of age and sex composition of whale stocks. Includes contour maps of plankton abundance seaward from the Kurile Islands, at various times in 1953. These are compared with the distribution of cephalopod mollusks, sauries and the various whales. The North Pacific whale catch is given by species and region, with data on mean length and size distribution. Main attention is given to food. Blue whales eat fish as well as krill. Right whales have increased in the Sea of Okhotsk and northwestern Pacific. Sperm, fin and sei whale populations are said to be adequate for whaling; blue and humpback whale populations are said to be low, requiring study.

1961a. O kolebanii chislennosti kitov v Chukotskom more v raznyye gody (Fluctuations in the number of whales of the Chukchi Sea in various years). Tr. Inst. Morfol. Zhivotnykh 34:54-64. In Russian. (Transl. by U.S. Nav. Oceanogr. Off., Washington, D.C., 1970, Transl. 478, 18 p.)

The number of whales in the Chukchi Sea and their distribution, summer-autumn, depends upon the ice conditions and food supply. Most of the author's observations were from 1948. Mixing of cold and warm water occurs in the south and southwest Chukchi. This creates favorable conditions for zooplankton, biomass of which was estimated as 450-800 mg/m^3 in September 1948. Predominant species were Calanus cristatus, C. finmarchicus, Thysanoessa rashii, and T. inermis. The small cetaceans

occurring in the Chukchi include: Phocoena phocoena vomerina, Phocoenoides dalli, Orcinus orca and Berardius bairdii. Delphinapterus leucas, Balaena mysticetus, and Monodon monoceros are believed to be permanent residents. Other species occasionally present include Rhachianectes glaucus [gray whale], Balaenoptera acutorostrata, Balaenoptera borealis, Balaenoptera physalus, Sibbaldius musculus [blue whale], and Megaptera nodosa.

1961b. Raiony nagula kitov v Beringovom more (Feeding regions of whales in the Bering Sea). Akad. Nauk SSSR, Tr. Inst. Morfol. Zhivotnykh 34:65-78. In Russian. (Engl. abstr., Biol. Abstr. 43(1), entry 551.)

Information from expeditions during 1947-1956 and 23 years of whaling data are used to provide a picture of the Bering Sea productivity. The highest surface concentrations of plankton occur near the Commander and Aleutian Islands and other areas of temperature flux. This attracts shoaling fish which are consumed by Phocaena phocaena, Globicephalus malus, Tursiops tursio, Orca orca, Ziphius spp., Berardius sp. and Mesoplodon sp. Large cetaceans consist of the finback whale and lesser rorqual. The time and appearance of the whales is determined by the food aggregations.

Slipp, J.W., and F. Wilke.
1953. The beaked whale Berardius on the Washington coast. J. Mammal. 34(1):105-113.

Authors examined the partially decomposed carcass of a Berardius bairdi [sic] stranded in July 1950 at Ocean City, Washington. This is the first specimen recorded for the coast of that state. Detailed measurements are given. It is noted that squid and octopus are the foods commonly found in stomachs of these animals in Japan, but that Berardius is occasionally found gorged with herring (Clupea pallasi). Authors argue that certain specimens taken in the North Pacific which have been identified as the Atlantic species of Hyperoodon were actually B. bairdi. So, such records of Hyperoodon may be transferred to the literature on Berardius in the North Pacific. 4 tab., 2 pl., 26 ref.

Small, George L.
1971. The blue whale. Columbia Univ. Press, New York. 248 p.

A general book on the blue whale. Includes some biology, but major emphasis is on whaling policies and the control of whaling, past and present.

Smith, Thomas G.
1973a. Censusing and estimating the size of ringed seal populations. Fish. Res. Board Can., Tech. Rep. 427, 18 p.+ figs.

Methodology of aerial surveys is discussed. From author's abstract: "A higher number of seals are seen along complex coastlines and different densities are observed in closely adjacent ice areas with different stability and ice cover. The latter appears to be directly related to the suitability of the ice as birth lair habitat." Other factors affecting counts are discussed. 3 tab., 4 fig., 10 ref.

1973b. Population dynamics of the ringed seal in the Canadian eastern arctic. Fish. Res. Board Can., Bull. 181, 55 p.

Two populations of ringed seals, from Cumberland Sound and Home Bay (Baffin Island, approx. 65°-70°N Lat.) were studied. Contents include: age determination and tooth structure; growth; reproduction; counts and behavioral observations on fast ice; estimates of population size; vital statistics of the population; dynamics of the population; management considerations. Subadult seals generally disperse offshore in winter and breeding adults remain in the fast ice. Peak haul-out is near the end of June. Aerial surveys described. 16 tab., 31 fig., 120 ref.

1974. Biology of the Beaufort region. Northern Perspectives, Can. Arctic Resour. Comm. 2(2):11-12.

There are 2 biological habitats of the southern Beaufort Sea: one is estuarine, influenced by the Mackenzie River outflow; the other is marine. The primary and secondary productivity of the area is low; this is reflected in the paucity of marine mammals of which ringed seals are the most abundant. The author estimates the summer population of bowhead whales to be several hundred animals, and beluga to be 4,000.

Smith, Thomas G., and Joseph R. Geraci.

1975. The effect of contact and ingestion of crude oil on ringed seals of the Beaufort Sea. Dep. Environ. [Can.], Beaufort Sea Project, Victoria, B.C., Can., Beaufort Sea Tech. Rep. #5, 66 p.

Studies were conducted on the effects of both immersion in oil and ingestion of oil on wild and captive ringed seals and on harp seal whitecoat pups. Appendix reports effect of crude oil on ringed seal pelts (See Øritsland, 1975). 27 tab., 5 fig., 33 ref.

Smith, T.G., and I. Stirling.

1975. The breeding habitat of the ringed seal (Phoca hispida). The birth lair and associated structures. Can. J. Zool. 53:1297-1305.

Authors' abstract: "The subnivean lairs of the ringed seal (Phoca hispida) were studied in the Amundsen Gulf and Prince Albert Sound areas from 1971 through 1974. The structure of several different types of lairs are described. The existence of a birth-lair complex consisting of several closely adjacent lairs appears likely. The spacial distribution of lairs and lair types found on refrozen leads and in pressure ridges is described. Lairs were more abundant in inshore ice than in offshore ice. The function of subnivean lairs appears to be to provide thermal shelter, especially for neonate seals, and protection from predation by arctic foxes (Alopex lagopus) and polar bears (Ursus maritimus)."

Spalding, D.J.

1964. Comparative feeding habits of the fur seal, sea lion, and harbor seal on the British Columbia coast. Fish. Res. Board Can., Bull. 146, 52 p.

The stomach contents from 113 fur seals, 393 sea lions and 126 harbor seals were examined. British Columbia coastal waters support 6,000 Steller sea lions and 17,000 harbor seals. An unknown number of fur seals migrate offshore. No interspecific competition was found. Predation on commercial fish was deemed negligible. Distribution and migration are discussed.

Spotte, Stephen.
1976. Seeking the unknown. Animal Kingdom 79(2):21-25.

Author spent 5 weeks (Feb.-March 1974) in Catalina Channel area on an unsuccessful pilot whale capturing cruise. Informal discussion of biology, live capture method, behavior, appearance, taxonomy and feeding. Range in eastern Pacific is said to extend northward to Kanatak, Alaska. 2 photos + cover photo.

Stirling, Ian.
1974a. Midsummer observations on the behavior of wild polar bears (Ursus maritimus). Can. J. Zool. 52:1191-1198.

Bears were observed in the Canadian arctic in the summer of 1973. Two types of hunting were observed, stalking (23%) and still-hunting (77%). A diurnal rhythm appeared wherein the animals slept most of the latter 1/3 of the day and hunted most in the early morning hours.

1974b. Polar bear research in the Beaufort Sea. P. 721-733 in J.C. Reed and J.E. Sater (eds.), The coast and shelf of the Beaufort Sea, Arctic Inst. North Am., Arlington, Virginia.

Distribution of polar bears follows that of the pack ice. The bears move south in autumn and are found in the southeast Beaufort in winter and spring, where they concentrate in areas that are likely to have periodic open water. In summer, the bears recede north with the pack ice. They feed mainly on ringed seals and occasionally on bearded seals. Usually only the skin and blubber are eaten.

Stirling, Ian, and W. Ralph Archibald.
1977. Aspects of predation of seals by polar bears. J. Fish. Res. Board Can. 34:(8):1126-1129.

Data were gathered, as part of mark and recapture programs conducted 1971-1975, from 227 ringed and bearded seals killed by polar bears in the Canadian high eastern arctic and western arctic in spring, and 17 killed in summer and fall. Tables show analysis of data by age of killed seals, percent utilization of carcasses, and success rate of bears at subnivean breathing holes and birth lairs. Seal remains left by bears probably support large numbers of arctic foxes. 4 tab., 12 ref.

Stirling, I., R. Archibald, and D. DeMaster.
1975. Distribution and abundance of seals in the eastern Beaufort Sea. Dep. Environ. [Can.], Beaufort Sea Project, Victoria, B.C., Can., Beaufort Sea Tech. Rep. #1, 58 p.

The two main seals in the Beaufort Sea are the ringed seal (Phoca hispida) and the bearded seal (Erignathus barbatus). In a 1974 aerial survey east of 140°W, and south of 78°N, 41,982 ringed seals and 2,759 bearded seals were counted. An identical census in 1975 yielded 21,661 ringed and 1,197 bearded seals.

Stroud, S.K.
1968. Risso's dolphin in Washington state. J. Mammal. 49(2):347-348.

Records the second known specimen found north of California. The carcass was found in April, 1967, on Makkaw Beach (48°19'N, 124°40'W) at which time animal had been on beach about 1 month. Stomach contained beaks from 7 species of squid. Body measurements given.

Sund, Paul N.
1975. Evidence of feeding during migration and of an early birth of the California gray whale (Eschrichtius robustus). J. Mammal. 56(1):265-266.

Two observations were recorded in an aerial survey. (1) Southward-bound whales were feeding off Monterey on 17 and 20 January 1973. (2) On 23 January 1973 a young calf was observed making a southward migration with its apparent mother. It is inferred that the calf must have been premature because the pair was still 700 miles north of the nearest calving lagoon.

Sund, P.N., and J.L. O'Connor.
1974. Aerial observations of gray whales during 1973. Mar. Fish. Rev. 36(4):51-52.

Gray whales were observed from an airplane during January 1973 off the California coast. Apparently aircraft observations are more accurate than shore stations, but are limited by sea conditions. This study confirms the belief that 95% of migrating whales pass within 1.2 miles of Yankee Pt. in California.

Tarasevich, M.N.
1963. K biologii morskogo zaitsa (Erignathus barbatus) (Biology of the bearded seal (Erignathus barbatus). Tr. Akad. Nauk SSSR, Inst. Okeanol. 71:223-225. In Russian. (Transl. by Fish. Mar. Serv., Ste. Anne de Bellevue, Quebec, Can., 1976, Transl. Ser. 3774, 4 p.)

From the end of September to October 1958, 54 seals taken from the Kara Sea were examined. The predominant food items were the crustaceans, Mesidothea sabini, Crangon spp., and gammarid amphipods. Sexual distribution of the seals is uneven and determined by oceanic depths. Females frequent shallower inshore waters.

Taylor, F.H.C., M. Fujinaga, and F. Wilke.
1955. Distribution and food habits of the fur seals of the North Pacific Ocean - Report of cooperative investigations by the governments of Canada, Japan, and the United States of America, February - July 1952. U.S. Dep. Inter., Fish Wildl. Serv., Washington, D.C. Gov. Print. Off. 86 p.

Six vessels operated off the coast of northeastern Japan 19 February to 17 June, and off southern Hokkaido 6-17 June (2,329 seals were collected). One vessel operated off California, Oregon and Washington 8 February to 30 April. One vessel operated off Alaska 4 June to 13 July: 686 seals were collected off North America; most work was done within 30 miles of shore. Location of winter concentrations of seals is noted; distribution by sex and age is discussed. Stomach contents are discussed area by area noting proportions made up by commercial species. 50 fig., 30 tab., 9 app.

Thomas, Rex, and V.B. Scheffer.
1940. Records of ringed seals from the Pribilof Islands. J. Mammal. 43(3):428.

On 21 June 1961, one Pusa hispida was seen basking on St. Paul Island. On 26 June 1961, one specimen was found dead on St. George Island.

Thompson, R.J.
1940. Analysis of stomach contents of whales taken during the years 1937 and 1938 from the North Pacific. M.Sc. Thesis, Univ. Washington, Seattle, 82-p.

The stomachs from 237 whales of 5 species taken off the Alaskan coast were analyzed along with 37 stomachs taken from animals off the California coast. Four species of euphausiids (Thysanoessa), 5 copepod species and the surf smelt (Hypomesus pretious) comprised the bulk of the food of the Alaskan baleen whales. Sperm whales took principally squid, octopus and fish.

Thorsteinson, Fredrik V., Richard W. Nelson and Dexter F. Lall.
1961. Experimental harvest of the Steller sea lion in Alaskan waters. U.S. Fish Wildl. Serv., Spec. Sci. Rep. Fish. 371, 15 p.

Authors' abstract: "During the summer of 1959, a commercial fishing company, under contract to the Bureau of Commercial Fisheries, conducted an experimental harvest of the Steller sea lion (Eumetopias jubata) in Alaska. During the expedition, 616 sea lions were killed of which 464 were ultimately processed. The yield was 200 tons of ground meat and 9 tons of whole livers, which was packaged in 50-pound bags, frozen, and sold through established commercial channels to fur farmers for feeding mink." 9 photos, 1 map.

Thorsteinson, Fredrik V., and Calvin J. Lensink.
1962. Biological observations of Steller sea lions taken during an experimental harvest. J. Wildl. Manage. 26(4):353-359.

Between May 27 and July 15, 1959, 464 sea lions, almost all breeding bulls, were harvested from five rookeries from Kodiak Island to the Krenitzen Islands: Marmot Island, Chowiet Island, Atkins Island, Jude Island, and Ugamak Island. Discussion includes sea lion behavior and reaction to hunting, reproduction, growth, sex and age composition of population, natural mortality of pups, and food habits.

Tikhomirov, E.A.

1959. K voprosu o pitanii sivucha teplokrovnymi zhivotnymi (The question of the use of warm-blooded animals as food by sea lions). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 47:185-186. In Russian. (Transl. by Bur. Commer. Fish., Seattle, Washington, 1963, 3 p.)

Remains of a white-coated ringed seal pup Phoca hispida were found in stomach of a large adult male sea lion Eumetopias jubatus, killed on the ice at 58°53'N, 155°30'E (Gulf of Shelekhov, Sea of Okhotsk), 2 May 1956. Three other adult male sea lions were taken in the region; alimentary tracts were empty. Author reviews literature on sea lion food habits.

1961. Raspredelenie i migratsii tyulenei v vodakh dal'nego vostoka (Distribution and migration of seals in waters of the far east). Tr. Soveshchanii Ikhtiologicheskoi Komissii Akad. Nauk SSSR (Reports of Conferences, The Ichthyological Commission of the Academy of Sciences of the USSR), Vol. 12:199-210, Soveshchanie po morskim mlekopitayushchim, 1959 e. (Conference on pelagic mammals, 1959). (Transl. by Leda Sagen for U.S. Fish Wildl. Serv., Mar. Mammal Biol. Lab., Sand Point Nav. Air Sta., Seattle 15, Wash., 26 p.)

Most data in this paper come from the Sea of Okhotsk. Some information is included on seals in the Bering and Chukchi Seas (obtained from hunting ship captains of 1957 and 1958 and from previous literature). Largha, bearded, ringed and ribbon seals are discussed individually with detailed information on biological cycles and movements of each. 3 fig., 12 ref.

1964a. O raspredelenii i biologii lastonogikh beringova morya (materialy 1-go ekspeditsionnogo reisa v 1962 g.) (Distribution and biology of Pinnipeds in the Bering Sea). Tr. Vses. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (VNIRO) 53 (Izv. Tikhookean. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (TINRO) 52):277-285. In Russian. (Transl. by Israel Program Sci. Transl., 1968, p. 272-280 in P.A. Moiseev (ed.), Soviet fisheries investigations in the northeast Pacific, Part 3, avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 67-51205.)

The Bering Sea, from Bristol Bay to the Bering Strait was surveyed for seals from 2 March to 1 July 1962. For harbor, ribbon and bearded seals, pupping takes place on the ice edge, and appears to occur simultaneously in all parts of the Bering Sea (mid-April). The nursing period continues until mid-May. Molting occurs from late May to mid-June; species differences in feeding needs at this time explain the distribution. The mechanism of reproduction is similar in all seal species, but maternal behavior is varied. For sea lions, parturition occurs in mid-June on coastal ground. Stomach dissections suggest herring is a staple food item at this time. Walruses winter in the southeastern Bering Sea. In March 1962 the population in this region numbered 10,000-15,000. Stomach dissections showed a predominance of shrimp and crab in the diet.

1964b. O raspredelenii i promysel sivucha beringovom more i sopredel'nykh raionakh tikhogo okeana (Distribution and hunting of the sea lion in the Bering Sea and adjacent parts of the Pacific). Tr. Vses. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (VNIRO) 53 (Izv. Tikhookean. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (TINRO) 52):287-291. In Russian. (Transl. by Israel Program Sci. Transl., 1968, p. 281-285 in P.A. Moiseev (ed.), Soviet fisheries investigations in the northeast Pacific, Part 3, avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 67-51205.)

Author estimates the sea lion stock of the entire North Pacific and Bering Sea to be 250,000 animals. The consumption of food by this population, based on a daily ration of 1/5 the body weight, is calculated to be 2,250,000 tons of food annually. The sea lions of Olyutorskii Bay and St. Matthew Island are said to consume 400-500 tons of herring daily. In Bristol Bay, sea lions concentrate near crab fisheries presumably because crab is a prominent item in their diet. The sea lion is also accused of destroying fishing nets and competing with fur seals for space on coastal rookeries. The article concludes that the population of sea lions should be reduced.

1966a. O razmnozhenii tyulenei semeistva Phocidae severnoi chasti tikhogo okeana (Reproduction of seals of the family Phocidae in the North Pacific). Zool. Zh. 45(2):275-281. In Russian. (Transl. by Fish. Res. Board Can., Ste. Anne de Bellevue, Que., 1971, Transl. Ser. 1889, 19 p.)

Data were collected from 1287 ringed, ribbon, harbor and bearded seals in the Okhotsk and Bering Seas in 1959-1962. Information on sexual maturity, whelping and reproductive biology show that the reproductive cycle is identical in all four species. Females reach sexual maturity earlier than males except in harbor seals, where the reverse is true. Mass pupping occurs in mid-April. Lactation lasts for 3-4 weeks. Mating occurs immediately after lactation ends, and implantation begins near the end of June. Since all the Far Eastern seals are found on ice, it is suggested the optimal period for births is at the time of maximum ice extension.

1966b. Opredelenie vidov dal'nevostochnykh tyulenei s samoleta (Identifying the species of Far Eastern seals from an airplane). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 58:163-172. In Russian. (Transl. by U.S. Dep. Inter., Bur. Commer. Fish., Seattle, Wash., 1966, p. 87-97 in K.I. Panin (ed.), Soviet research on marine mammals of the Far East.)

Discusses ringed, harbor, ribbon and bearded seal as observed in the Okhotsk, Bering and Chukchi Seas. For each species, notes distribution, degree of gregariousness, type of ice favored, usual placement on ice, appearance, and behavior. Many useful details. Optimum flying altitude felt to be 600 meters. 5 fig.

1968. Rost tela i razvitie organov razmnozheniya severotikhookeanskikh nastoyashchikh tyulenei (Body growth and development of reproductive organs of the North Pacific phocids). Tr. Vses. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. (VNIRO) 68 (Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 62):216-243. In Russian with English summary. (Transl. by Israel Program Sci. Transl., 1971, p. 213-241 in V.A. Arsen'ev and K.I. Panin (eds.), Pinnipeds of the North Pacific, avail. Natl. Tech. Inf. Serv., Springfield, Va., as TT 70-54020.)

In 1959-1961, in the Sea of Okhotsk, and in 1962 and 1964 in the Bering Sea, 1,521 seals were examined, including ringed, ribbon, common and bearded seals. Growth rates, weights, age at sexual maturity and life expectancy are given for each species. A table of ecological description is offered with food distribution and migratory patterns. 10 tab., 20 fig., 29 ref.

1975. Research on Pacific pinnipeds carried out by TINRO during the last decades. In K. Ronald and A. W. Mansfield (eds.), Biology of the seal. Rapp. P.-v. Réun. Cons. int. Explor. Mer 169:552. [Abstr.]

Before 1950's, research was confined to earless seals in Okhotsk Sea, and walrus. In 1958 new laboratories were organized and pinniped research staff was increased. Since then, distribution and abundance surveys, including aerial surveys, have been carried out in Bering Sea as well as Okhotsk Sea and Kuril Islands. Discreteness of populations has been investigated and physiological research is noted. Monographs on fur seal, bearded seal, and ringed seal are in preparation.

Tikhomirov, E.A., and G.M. Kosygin.

1966a. O mechenii tyulenei v Okhotskom i Beringovom moryakh (On the tagging of seals in the Sea of Okhotsk and Bering Sea). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 58:159-162. In Russian. (Transl. by U.S. Dep. Inter., Bur. Commer. Fish., Seattle, Wash., 1966, p. 83-86 in K.I. Panin (ed.), Soviet research on marine mammals of the Far East.)

Tagging began with 16 seals in 1961 in Okhotsk Sea. In 1962, 35 seals were tagged in the Bering Sea, and 1 in the Chukchi Sea. In the Bering Sea, 204 were tagged in 1963 and 71 in 1964. Authors discuss pros and cons of tagging method and materials. Six out of a total of 327 tagged seals have been recovered. A figure shows movements of 4 ribbon seals between St. Matthew Island and St. Lawrence Island, and the northwestward movement of one ringed seal northwest of Cape Cezhneva.

1966b. Perspektivy promysla lastonogikh v Beringovom more (Prospects for commercial sealing in the Bering Sea). Rybn. Khoz. 42(9):25-28. In Russian. (Transl. by U.S. Dep. Inter., Bur. Commer. Fish., Seattle, Wash., 6 p.)

Data were collected March-June 1962-1965 in the Bering Sea. Ice and meteorological conditions are discussed. Most ribbon and bearded seals are found between St. Lawrence and St. Matthew Islands. The majority of ringed seals occur in Anadyr Bay. Large number of harbor seals are found in Anadyr Bay, St. Matthew, Nunivak and the Pribilof Islands. Notes pupping and molting. Steller sea lions found on ice edge in region of St. Matthew Island.

Tillman, Michael F.

1975. Assessment of North Pacific stocks of whales. Mar. Fish. Rev. 37(10):1-4.

Modern whaling in the North Pacific is reviewed. Stocks of commercial whales are assessed as follows, giving "original population", "maximum sustainable yield level", and "current population" (in that order): fin whale - 44,000, 27,000, 17,000; Bryde's whale - "unknown", 10-15,000, 20-30,000; male sperm whales - 166,000, 58,000, 72,000; female sperm whales - 152,000, 79,000, 125,000; sei whales - 50,000, 28-29,000, 20,600. (Sei whale stock was only recently assessed, by Marine Mammal Division.) Gray whales are stable at 11,000. Black right whales are severely depressed, fluctuating near 200. Blue whales and humpback whales have been protected through the International Whaling Commission since 1966. Blue whales had declined to 1,500 in 1966 from an estimated original population of 5,000. Humpback whales now number a few hundred and may be showing some recovery (originally numbering in the thousands). Recent research, IWC action on proposed whaling moratorium, and future research needs are discussed. 2 tab., 4 fig., 2 ref.

1977a. Progress report on gray and bowhead whale research. Paper prepared for US-USSR meeting, La Jolla, California, January, 1977. 4 p. + tab. (Avail. Northwest and Alaska Fish. Cent., Natl. Mar. Mammal Lab., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115.)

Gray whale census activities are described and counts from California 1952/53-1975/76 are tabulated. Monitoring of the Eskimo harvest of bowhead whales beginning 1973 is discussed. Increase in number of whaling crews has brought an increased catch, and change in whaling methodology has resulted in larger numbers of whales killed-and-lost, and those struck-and-lost. Average annual catches of bowhead whales by Alaskan Eskimos, 1852-1976 are tabulated. 4 tab.

1977b. Trends in abundance of sperm whales in three areas of the North Pacific. Rep. Int. Whaling Comm. 27:343-350.

Available catch per unit effort (CPUE) data from Soviet and Japanese whaling through 1975 are analyzed by three longitudinal sectors: west of 170°E (including coastal waters of Japan, Kuril Islands, Kamchatka), east of 150°W (including Gulf of Alaska and North American coastal waters), and 180°-160°W (including central North Pacific and Aleutian Islands). Sexes are considered separately. From this analysis, "central" males and "Asian" females appear to be the most severely reduced. Implications for management are stated. 4 tab., 7 fig.

Tomilin, A.G.

1957. Kitoobraznye (Cetacea). Vol. IX of Zveri SSSR i prilezhashchikh stran (Mammals of the USSR and adjacent countries). Izd. Akad. Nauk SSSR, Moskva, 756 p. In Russian. (Transl. by Israel Program Sci. Transl., 1967, 717 p., avail. Natl. Tech. Inf. Serv., Springfield, Va.)

Encyclopedic account of species', including: nomenclature, external appearance, geographical distribution and migrations, biology, and whaling industry and its products (when applicable). Includes abundant citations from literature, author's recorded observations (largely from cruise in mid-1930's), plus information gleaned from natives of coastal areas (e.g. Siberian coast). Stomach contents are given for specific regions when known. Gives bibliography of "most important pictures" for each species; however there is no comprehensive bibliography. Illustrations and photos.

1960. O migratsiyakh, geograficheskikh rasakh, termoregulyatsii i vliyanii temperatury sredy na rasprostranenie kitoobraznykh (The migrations, geographical races, the thermo-regulation and the effect of the temperature of the environment upon the distribution of the cetaceans). P. 3-25 in Migratsii zhivotnykh (Animal migrations), no. 2, Akad. Nauk SSSR, 1960. (Transl. by Fish. Res. Board Can., 1962, Transl. Ser. 385, Biol. Sta. Nanaimo, British Columbia, 24 p.)

It is shown by marking data that whale populations do not migrate freely, but are confined to an area of the ocean. Size differences between whales of the northern and southern hemispheres are attributed to the greater cold and more abundant food of the southern hemisphere. Research on thermoregulation in cetacea is reviewed.

Tomilin, A.G., and A.A. Kibal'chich.

1975. Morzhi raiona ostrova Vrangelya (Walruses of the region of Wrangel Island). Zool. Zh. 54(2):266-272. In Russian. (Transl. by Dep. Environ., Fish. Mar. Serv., 1976, Transl. Ser. 3721, Arctic Biol. Sta., Ste. Anne de Bellevue, Quebec, Canada, 15 p.)

A study of the walrus in the Wrangel Island area during 1972 and 1973. In 1972, the population on one rookery was 36,000. The timing of hauling out and numbers of animals using this site depend on hydrological conditions and the ice situation. Animals haul out there only when the sea is ice free. Age structure of the population is mixed. Data are also provided on the feeding, reproduction and behavior of the walrus. Stomach contents included Mya, Priapulus and Ampelisca macrocephala. 1 tab., 1 fig., 10 ref.

Tomilin, A.G., and D.A. Morozov.

1968. (Sucking in of food - a previously unknown method of Phocaena phocaena feeding). Tr. Vses. Sel'skokhozyaystvennogo Inst. Zaochnogo Obrazovaniya 31:201-202. In Russian. (Transl. by Joint Publ. Res. Serv., 1970, p. 18-19 in Soviet studies on cetaceans, avail. Natl. Tech. Inf. Serv., Springfield, Va., as JPRS 49777.)

Records feeding mechanism of 2 harbor porpoises in captivity. In addition to seizing prey with their teeth, they can suck in food from 10 cm away. Skipjack was preferred, then sea bass and anchovy. Suction may be possible because of the blunt, spatulate teeth, and the broad, short snout.

Tomilin, A.G., and M.I. Smyshlyayev.
1968. O nekotorykh faktorakh smertnosti kitov (k voprosu o boleznyakh kitoobrazykh) [Some factors affecting whale mortality (diseases of cetaceans)]. Byulleten' Moskovskogo Obshchestva Ispylateley Prirody, Otdek Biologicheskiy, 3:5-12. In Russian. (Transl. by Joint Publ. Res. Serv., 1970, p. 1-9 in Soviet studies on cetaceans, avail. Natl. Tech. Inf. Serv., Springfield, Va., as JPRS 49777.)

(In addition to human factors) Whales are subject to at least 17 species of ectoparasites and 117 species of endoparasites. Toothed whales are most affected by parasites of the digestive system whereas baleen whales are afflicted in the genitourinary system. The article recounts other possible ailments including bone fractures, skin diseases, and tumors. A new disease is described that weakens the gums to the extent that baleen plates fall out. The effects of radioactivity on cetaceans are speculated upon.

Townsend C.H.
1912. The northern elephant seal Macrorhinus angustirostris (Gill). Zoologica 1:159-173.

Elephant seal found only on Guadalupe Island (150 animals). Ten animals were collected in 1911. The largest males were 16 feet in length. They appear to be lethargic and not easily disturbed. Fighting described. No stomachs contained food. Remarkable flexibility of elephant seals is noted and attitudes described.

1935. The distribution of certain whales as shown by logbook records of American whaleships. Zoologica 19(1):3-50.

Compilation of the records from 744 vessels and 1,665 voyages carried out from 1785 to 1916. Tables made of the catches of 6 species of whale (sperm, bowhead, northern right, southern right, humpback and California grey) in 3 oceans (Atlantic, Pacific and Indian). Whaling in the North Pacific and Bering Sea involved the right and bowhead whales and occurred almost exclusively during the summer months. Maps included showing seasonal catches.

Uda, Michitaka.
1954. Studies of the relation between the whaling grounds and the hydrographical conditions (I). Sci. Rep. Whales Res. Inst. 9:179-187.

Data from 1910-1951 were collected from all catcher boats to plot yearly whaling grounds off the Japanese coast. These have been examined with respect to the oceanographic conditions, primarily the surface temperature. Mixing areas between cold and warm water masses seem to correspond to the centers of the most productive whaling grounds. The currents off Japan and the Kurile Islands are examined in detail.

Uda, Michitaka, and Keiji Nasu.
1956. Studies of the whaling grounds in the northern sea-region of the Pacific Ocean in relation to the meteorological and oceanographic conditions (Part I). Sci. Rep. Whales Res. Inst. 11:163-179.

Concerns two whaling areas: (1) Sea-region adjacent to and northeast of Japan. Six charts show blue, fin, sei and sperm whales caught, with sea and weather conditions, during July and August 1953. Influence of cyclones is analyzed. (2) Waters of Aleutian chain. Two charts of Aleutian waters show blue, fin, sei, sperm and humpback whales caught May-September 1954. Weather and sea conditions are discussed. Good whaling is found where water masses of different temperatures meet, and in foggy conditions.

Ulmer, F.A.
1943. Two records of Dall's porpoise (Phocoenoides dalli). J. Mammal. 24(3):394.

One museum specimen was captured in Chatham Strait, southeast Alaska, summer 1933; another in the inside passage, 50 mi. north of Prince Rupert, British Columbia, August, 1939. Measurements given.

U.S. Fish and Wildlife Service.
1976. Species status report. Part II (p. 56723-56736) in Administration and status report of the Marine Mammal Protection Act of 1972; June 22, 1975 to June 21, 1976. Federal Register 41(251):56718-56736.

For each species, the following topical outline is followed: distribution and migration; abundance and trends (and harvest); general biology; ecological problems; allocation problems; regulations; and current research. Polar bear: There are six geographically isolated populations in the main polar basin. One centers in western Alaska and another in northern Alaska. Alaskan bears can winter as far south as St. Matthew Island. In summer, bears occur with the pack ice edge between 71°N and 72°N latitude. World population is estimated at 10,000-20,000 but abundance of bears off Alaskan coast coupled with sustained harvest suggest this estimate may be low. A significant number of bears are believed to den on the north slope of Alaska. Sea Otter: Distribution is described as central California north to Prince William Sound and westward along the Aleutian Chain and Commander Islands, and along southern Kamchatka Peninsula and Kuril Islands. In 1973, Alaska Department of Fish and Game estimated total Alaskan population of sea otters at 101,050-121,050. California sea otter population has been estimated at 1,600-1,800. Transplant efforts, pesticide residues, and the threat of oil pollution are mentioned. Pacific Walrus: Population winters in seasonal pack ice of Bering Sea, from Bristol Bay to St. Lawrence Island area. Most begin to migrate northward into the Arctic Ocean in April (though about 5,000 males remain on or near Round Island, Bristol Bay), and then disperse along the ice edge from about Pt. Barrow west to the Kolyma River (East Siberian Sea). From aerial survey efforts by the U.S.S.R. and U.S., very crude measures of walrus population were

obtained: 96,000 were counted along Soviet coastline; and it was estimated that along the ice edge in the Arctic Ocean, 30,000-40,000 occur west of the International Date Line, and 75,000 occur east of that line. Other Species: Atlantic walrus, manatees, dugong, and marine otter.

Uspensky, S.M., and V.I. Shilnikov.
1969. Raspredelenie i chislennost' belykh medvedei v arktike po dannym arianablyudenii ledovoi razvedki (Distribution and numbers of the polar bear in the arctic according to the data of aerial ice surveys). P. 89-102 in A.G. Bannikov, A.A. Kishchinskii and S.M. Uspensky (eds.), The polar bear and its conservation in the Soviet arctic. Izd. Gidrometeorologicheskoe, Leningrad. In Russian with English summary.

Aerial surveys were flown in the Soviet arctic and the Barents Sea in 1962. Bears appeared to be more common on young ice fields. Density of bears seen in surveyed areas is utilized to give a world population estimate of 10-15,000 animals. [This collection of papers also contains an annotated bibliography of the Russian polar bear literature.]

Vania, John, and Edward Klinkhart.
1967. Marine mammal report. Alaska Dep. Fish Game, Fed. Aid Wildl. Restoration Proj. Rep. Vol. 8, 24 p.

Reports work done in 1966. Sea lions: female reproductive tracts examined (delay of implantation found to be 3 months); pup pelage examined; molt at Lat. 58°-59°N found to last from last week July until beyond 25 October; total harvest 3,907, from Sugarloaf, Marmot and Akutan Islands. Sea otter: Thirty otters transplanted from Prince William Sound to Klag Bay (southeast Alaska) and Yakutat Bay; breeding success not confirmed. 2 fig. Hair seals: 300 harbor seals tagged on Tugidak Island - 45 recovered; aerial surveys of Tugidak Island, Port Heiden - Port Moller, Sitkinak Island, Seal Island, and Cinder River. Beluga whales: Belugas moved away from killer whale sounds transmitted underwater in Naknek River (Bristol Bay); measurements and stomach contents given of 11 belugas collected in Kvichak River, 1965-66.

Vania, John, Edward Klinkhart, and Karl Schneider.
1968. Marine mammal report. Alaska Dep. Fish Game, Fed. Aid Wildl. Restoration Proj. Rep. Vol. 9, 46 p.

Reports work done in 1967. Sea lions: Monitored harvest - hunters took 4,855 pup pelts; harvesting activity caused several thousand sea lions to shift from one area of rookery to another. Sea otter: Sighted transplanted otters near Klag Bay; made experimental harvest of 300 from Adak Island, 205 from Amchitka Island; sold pelts with 500 from previous experimental harvests in 1962-63; tabulated external measurements, dates and locations of collection. Harbor seals: From pelage specimens, it was found that molt occurs from late August to late October; 1,106 pups were tagged on Tugidak Island, 180 at Port Heiden; aerial surveys were made of these areas in June, July and August. Beluga whales: Killer whale noises were broadcasted underwater in Naknek and Kvichak Rivers (Bristol Bay); belugas responded at a distance of about 1 mile, changing previously observed daily movements to avoid area of transmitter.

Vladimirov, V.A.
1972. O pereselenii morskikh kotikov s o-va Tyulenii (The resettlement of fur seals from Tyuleni Island.) Rybn. Khoz. (11):27-28, November 1972. In Russian. (Transl. by For. Fish. (Transl.), Int. Activities Staff, Natl. Mar. Fish. Serv., Natl. Oceanic Atmos. Admin., U.S. Dep. Commer., Page Bldg., 3300 Whitehaven St. NW, Washington, D.C. 20235. 3 p.)

All hauling and rookery space on Tiuleny [Robben] Island is now utilized by fur seals and population has ceased to grow. Suitable site was found on the southern part of the Terpenia Peninsula on Sakhalin Island to relocate 300 fur seals. Criteria for site selection, and plans for transplant operation are covered in detail. 2 fig.

Wada, Shiro.
1975. Indices of abundance of large-sized whales in the North Pacific in 1973 whaling season. Rep. Int. Comm. Whaling 25:129-165.

Effort and catch for 1973 are tabulated by species and area. Indices of abundance, calculated from (1) Japanese catch and effort data and (2) Japanese sighting data, and presented the previous year, are updated and revised. Area of operation was extended southward to about 25°N. In addition to indices, appendices give raw species data from Japanese catch 1966-1974 and Japanese sightings 1965-1974 tabulated by 10° squares, and 5° (Lat.) x 10° (Long.) squares respectively. 4 tab. + 4 app. tab., 2 fig.

1976. Indices of abundance of large-sized whales in the North Pacific in the 1974 whaling season [SC/27/Doc 28]. P. 382-391 in Rep. and papers of the Scientific Committee of the Commission - 1975, Int. Comm. Whaling. [By the prior procedure, the material in this volume would have been published with the 26th report of the International Commission on Whaling.]

Effort and catch for 1974 are tabulated by species and area. Japanese catch and sighting data and indices of abundance from 1974 are tabulated, updating previous tabulations. 4 tab. + 2 app. tab., 2 fig.

1977. Indices of abundance of large-sized whales in the North Pacific in the 1975 whaling season. Rep. Int. Whaling Comm. 27:189-194.

Effort and catch for 1975 are tabulated by area. Japanese catch and sighting data and indices of abundance for 1975 are tabulated, updating previous tabulations. An index for Bryde's whales is included for the first time. Distance covered in sighting activities has decreased steadily since 1972. 4 tab. + 2 app. tab., 2 fig.

Watkins, William A., and G. Carleton Ray.
1977. Underwater sounds from ribbon seal, Phoca (Histriophoca) fasciata. Fish. Bull. 75(2):450-453.

Recordings were made 16-18 and 23 May 1967, in waters off Savoonga, St. Lawrence Is., Alaska (Bering Sea). Ribbon seals were unusually plentiful in 1967. Two types of sounds - a relatively intense prolonged downward sweep in frequency and a broadband puffing sound - were attributed to ribbon seals, for reasons which are explained. Acoustic characteristics of calls are described. 3 fig.

Whales Research Institute.
1967. Summarized result of the whale marking in the North Pacific. Rep. Int. Comm. Whaling 17:116-119.

By the end of 1965, 4,907 whales had been marked by Canada, Japan, USA and USSR. The marks from 13 blue, 166 fin, 49 sei-or-Bryde's, 18 humpback and 130 sperm whales were recovered. The North Pacific was broken into 13 areas extending from the Bering Strait to 10°N. Figures are given for each species with the number of animals marked and recaptured in each area.

Wilke, Ford, and Clifford H. Fiscus.
1961. Gray whale observations. J. Mammal. 42(1):108-109.

Reports observations off Washington, off Kodiak Is. and in the Chukchi Sea, Bering Sea and Gulf of Alaska. Includes thoughts on route of migration (favoring use of eastern Aleutian passes), and observations of feeding.

Wilke, Ford, and Karl W. Kenyon.
1952. Notes on the food of fur seal, sea-lion, and harbor porpoise. J. Wildl. Manage. 16(3):396-397.

Contents of 148 fur seal stomachs, collected in West Crawfish Inlet, near Sitka, Alaska, in winters of 1950 and 1951, were 99.5% herring. Fur seals disgorge otoliths of gadid fishes (including pollack) on Pribilof Island rookeries in summer. Three northern sea lions from the Pribilof Islands yielded sand lance, flounder, other fish and one squid beak. One harbor porpoise, taken near Port Townsend, Washington, yielded remains of five herring.

1954. Migration and food of the northern fur seal. Trans. 19th North Am. Wildl. Conf.:430-440. Wildl. Manage. Inst., Washington, D.C.

Reviews history of pelagic studies of northern fur seal. Summarizes U.S. pelagic research 1947-1952. Includes some findings of joint research project done in spring of 1952 by scientists of Canada, US, and Japan, in which seals were taken from waters off Japan and North America. Tag recoveries indicate that 1-5% of Pribilof seals winter off Japan, comprising 27% of an estimated 137,000 fur seals wintering there. Upon leaving the Pribilofs, those seals bound for the North American coast are thought to fan out southward and eastward into the eastern North Pacific, arrive in coastal waters 10-30 miles from shore anywhere from southern California to southeastern Alaska, and later work their way gradually back to the Pribilofs, in the same coastal zone. Age and sexual segration patterns, sites of winter concentrations, and food are discussed.

Wilke, Ford, Karl Niggol, and Clifford H. Fiscus.
1958. Pelagic fur seal investigations - California, Oregon, Washington, and Alaska, 1958. U.S. Fish Wildl. Serv., Section of Marine Mammal Research, Seattle, Wash., Processed Rep., 96 p.

The first year of pelagic research, under the terms of the Interim Convention on Conservation of North Pacific Fur Seals, was conducted from 1 February to 1 July, from California waters to the Bering Sea. Off Alaska, concentrations of fur seals were found at Portlock Bank, off Kodiak, and between Sanak Island and Unimak Pass. Of 1,503 seals collected, 168 were male. Age and reproductive condition were determined and stomach contents reported. Water temperature was recorded.

Wolman, Allen A.
1972. Humpback whale. P. 38-43 in A. Seed (ed.), Baleen whales in eastern North Pacific and arctic waters, Pacific Search Books, Seattle, Wash.

A general article concerning the morphology and life history of Megaptera novaeangliae. A northward migration occurs in March-April from California and Mexico to the Bering Strait and the Chukchi Sea. The whales spend about 5-1/2 months on these feeding grounds. They feed primarily on euphausiids, but are known to take anchovies occasionally. A total of fewer than 2,000 humpbacks in the North Pacific is estimated.

1978. Humpback whale. P. 46-53 in Delphine Haley (ed.), Marine mammals of eastern North Pacific and Arctic waters, Pacific Search Press, Seattle, Wash.

[See Haley, 1978a.]

York, Anne E.
In press. Age at first reproduction of the northern fur seal: A preliminary report. Science in Alaska, Proc. 29th Alaska Sci. Conf., Fairbanks, Alaska, August 15-17, 1978, 14 p.

Author's abstract: "Pelagic collections of northern fur seals, Callorhinus ursinus, were made by the United States off the Pacific coasts of Canada and the United States between 1958 and 1974. This report concentrates on the primiparous pregnant animals from those year classes in which a sufficient range of ages is represented in the collections. Mean age at first reproduction is estimated for the 1954-1964 year classes. These range from 5.53 for the 1964 year class to 6.98 for the 1956 year class. A strong relationship between the mean age at first reproduction and the early survival rate of the year class is discussed along with the relationship between the age at first reproduction and the commercial harvest of females on the Pribilof Islands between 1958 and 1968." 1 tab., 5 fig., 8 ref., app.

Zenkovich, B.A.
1955. O migratsiiakh kitov. Promyslove raiony v dal'nevostochnykh vodakh (The migration of whales, whale fishing in the waters of the Soviet far east). P. 51-68 in S.E. Kleinenberg and T.I. Makarova (eds.), Kitoboiny Promysel Sovetskogo Soyuza (The whaling industry of the Soviet Union) (107 p.), Vses. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. [VNIRO] Izdatel'stvo, Part One, Chapter III. (Transl. by Israel Program Sci. Transl., 1968, for U.S. Dep. Inter. and Sci. Found., 14 p.)

According to evidence and records here cited, sperm whales crossed the equator in substantial numbers, and have crossed from Pacific to Atlantic and from Atlantic to Indian Oceans; bowheads have moved from Greenland waters to Pacific waters; sei whales may travel from Antarctic waters to north Pacific waters. Whale migrations are regulated by food accumulations and hydrological conditions appropriate for rearing young. Effect of a weakening of the warm Japan current in the 1940's upon abundance of whales' prey species and thence upon distribution of whales is described. Segregation by age during migration reported. Baleen whales of Soviet far eastern seas move south in mid-September, gravid females leaving first. Sperm whales tend to migrate south earlier. These regions are discussed individually: (1) The "southern" region, i.e., Pacific shore of southern Kamchatka Peninsula. (2) Commander Islands. (3) Olyutorski Gulf. (4) "The region of the young of the gray California whales," i.e., Glubokaya-Severnaya Bay north to Cape Navarin. Of this area author writes, "We used to count over a thousand gray whales during our observations over 7-8 days in the season." (This coastal region is unsuitable for whaling but establishment of an observation station there is contemplated.) (5) Anadyr Gulf. (6) Bering Strait. (7) Kurile Islands. Whales discussed are: sperm, fin, blue, sei, minke, bottlenose (Berardius) and killer. At Cape Olyutorsk, ringed seal and sea lion rookeries, and walruses are mentioned.

1971. Uchast' kitov (The fate of whales). Izv. Atlant. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (AtlantNIRO) 39:7-27. In Russian. (Transl. by Fish. Mar. Serv., Quebec, Can., 1974, p. 4-41 in K.K. Chapskii and (ed.) E.S. Mil'chenko, Research on marine mammals, Transl. Ser. 3185 [562 p.]).

World oceans are divided into 4 areas: North Pacific, North Atlantic, Antarctic and Southern hemisphere. Article provides catch statistics on the blue, fin, humpback, sei, sperm and grey whales from 1900-1967, in each area. Anecdotal information offered on external parasites as they occur in different waters. Plea is made for stringent quotas in all 4 areas on the three remaining commercial species (fin, sei, sperm). 4 tab., 12 ref.

Zhirnov, L.V., A.A. Vinokurov, and V.A. Bychkov.
1975. Redkie mlekopitayushchie, ptitsy i ikh okhrana v SSSR (Rare mammals, birds and their protection in the USSR). Moscow: Ministry of Agriculture. 82 p. In Russian. (Chapter 3, Marine Mammals, p. 27-38 plus accompanying references, translated by Francis H. Fay, Univ. Alaska, Fairbanks, 1977, 17 p.)

Over the years 1968-1973, fourteen species of marine mammals have been identified as rare and vanishing, including the following from the vicinity of Alaska: spotted seal (Phoca vitulina richardi Gray, = P. kurilensis Inukai, = P. insularis Belkin); bowhead whale; Japanese right whale; gray whale; northern humpback whale; northern blue whale; northern fin whale; sea otter; polar bear. For the pinnipeds and carnivores residing in USSR territory, various population estimates made over recent decades are cited. Statuses of cetacean stocks are briefly described. In many cases recommendations include refuge areas and/or complete protection from harvesting.

Zimushko, V.V.

1969a. Materialy po razmnozheniyu serykh kitov (Data on the reproduction of gray whales). P. 24-28 in Fourth All-Union Conference on the study of marine mammals, Kaliningrad, 16-18 September 1969. Akad. Nauk SSSR, VNIRO, AtlantNIRO, Moscow, 1969. In Russian. (Transl. by Leda V. Sagen, Fish. Res. Inst., Univ. Washington, Seattle, 4 p.)

Conclusions regarding correlation of length and sexual maturity [given in Zimushko 1969b] are recapitulated. Examination of whales caught in 1967-1968 included earplugs, as well as reproductive condition and body length. The assumption is that two layers in the earplug are formed per year. These data indicate that gray whales mature during the fifth to sixth year of life, and begin to reproduce when they have 9-11 layers in their earplugs. Examination of ovaries of 20 gray whales, combined with their ages (determined as above) showed 2 different sexual cycles: About 25% of these females seemed to calve once every 2 years; about 75% seemed to calve once every year for 2-4 years and then have a period of rest. By way of partial confirmation of the existence of this latter cycle, author relates that he has encountered 7 female whales simultaneously pregnant and lactating. By consideration of the ratios between males and females, the proportion of sexually mature females, and number of females participating in reproduction, the birth rate for this population of gray whales is calculated at about 23%.

1969b. Nekotorye dannye po biologii serogo kita (Some data on the biology of the gray whale). P. 93-97 in V.A. Arsen'ev, B.A. Zenkovich, and K.K. Chapskii (eds.), Morskie mlekopitayushchie (Marine mammals) [a collection of articles containing materials from the 3rd All-Union Conf. on Marine Mammals], Akad. Nauk SSSR, Min. Rybn. Khoz. SSSR, Ikhtiol. Kom., Izd. "Nauka", Moscow. In Russian. (Transl. by Leda V. Sagen, Assoc., Coll. Fish., Univ. Washington, Seattle, 10 p.)

Biological samples were examined from the gray whales harvested from waters of the Chukot Peninsula in 1965 (summer-fall) and 1966 (July-August). Data from 29 males (size and weight of testes and condition of seminal ducts) indicated that males attain sexual maturity when body length is about 11.5m. Data from 34 females (on presence of fetus or corpora lutea or corpora albicantia) indicated that they attain sexual maturity at a body length of about 12 m. Size composition of the catches indicates increase in population of whales. 2 tab, 2 fig.

1970a. Aerovizual'nyi uchet chislennosti i nablyudeniya za raspredeleniem serykh kitov v pribrezhnykh vodakh Chukotki (Aero-visual censusing of population and observations on the distribution of grey whales in coastal waters of the Chukchi Sea*). Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 71:289-294. In Russian. (Transl. by Fish. Res. Board Can., 1973, Transl. Ser. 2391, 13 p.) *[Title is inaccurately translated, and should read "...in coastal waters of the Chukot Peninsula".]

History of grey whale population estimates is reviewed. The author and A.V. Yevzerov conducted aerial surveys of grey whales in coastal waters of the Chukot Peninsula from 10 to 30 July 1968. (Humpback, minke, and beluga whales were also seen but are not discussed here.) Coastal waters were surveyed from the shore out to at least 50 km offshore, and as far as 100 km offshore where shallows extended that far. Abundance of grey whales in the survey area is calculated to be 2 times the number of animals observed (or, about 4,800 animals), and total California-Chukchi stock is estimated at slightly over 5,000. Critical comments on this initial aerial census are offered. 1 tab., 1 fig.

1970b. K voprosu ob opredelenii vozrasta serogo kita (Eschrichtius gibbosus, Erx. 1777) [Age determination of the grey whale (Eschrichtius gibbosus, Erx. 1777)]. Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (TINRO) 71:295-300. In Russian. (Transl. by Fish. Res. Board Can., 1973, Transl. Ser. 2426, 9 p.)

The lengths of 136 gray whales, collected from June through October in recent years, were plotted. Growth of males and females was shown to proceed at roughly the same rate until the onset of sexual maturity. Peaks in the length curves are apparent, and whales fall into the following length groups: (1) less than 8.0m, (2) average length 8.9m, (3) average length 10.4m, (4) average length 11m, (5) average length 12.2m, and (6) length 12.5m and more. These groups are interpreted as being, respectively: the young of the current year; yearlings; 2-year-olds; 3-year-olds; 4-year-olds; and senior age groups. The third group showed an average of 5 earplug layers; the fourth group showed an average of 8 earplug layers. (Recent reports are cited which show that only one layer per year is formed in earplugs of fin whales rather than two layers as is generally believed to be the case in gray whales.) Length and number of earplug layers (ranging from 4 to 56) are tabulated for 50 animals. 2 tab., 2 fig. [Note: In this translation the word for earplug is mistranslated as "otolith".]

1970c. Opredelenie sledov zheltykh tel no yaichnikakh u serogo kita - Eschrichtius gibbosus (cetacea, eschrichtiidae) [Detection of corpora lutea traces in the ovaries of the gray whale - Eschrichtius gibbosus (cetacea, eschrichtiidae)]. Zool. Zhurnal 49(7):1073-1080. (Transl. by S. Pearson, 1973, for Mar. Mammal Biol. Lab., Natl. Mar. Fish. Serv., Seattle, Wash., 11 p.)

The ovaries of 70 mature gray whales were examined. Two types of corpus luteum traces were found, which differ both macroscopically and in microstructure. These are described in detail and are identified as traces of pregnancy, and traces of ovulation. Atretic follicles and atretic corpora are described. 1 tab., 2 fig.

1971. Materialy po razmnozheniyu serykh kitov (Data on the reproduction of gray whales). In Issledovaniya Morskikh Mlekopitayushchikh (Research on marine mammals). Tr. Atlant. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. (AtlantNIRO) 39:44-53. (Transl. by S. Pearson, 1973, for Mar. Mammal Biol. Lab., Natl. Mar. Fish. Serv., Seattle, Wash., 13 p.)

Data on length, age (assuming two layers per year in earplugs), and reproductive condition are combined. Data come from harvests during summers of 1965-1968 by coastal villages on the Chukot Peninsula. After build-up of 8-10 layers in the earplug (roughly the age of onset of sexual maturity), growth rate is reduced. It was concluded that gray whales attain sexual maturity at an age of five to six years, and that most males attain it at an age of five years. Analysis of ovaries indicated that younger females became pregnant after ovulation more often than older ones, and that the first ovulation usually results in pregnancy. It was determined that roughly 40% of the females give birth every other year and roughly 60% give birth yearly 2-4 times in succession, with a one- or two-year resting period following such a series. Birth rate is calculated at 18%. 4 tab., 3 fig.

Zimushko, V.V., and S.A. Lenskaya.

1970. O pitanii serogo kita (Eschrichtius robustus Erx.) na mestakh nagula [Feeding of the gray whale (Eschrichtius robustus Erx.) at foraging grounds]. Ekologia, Akad. Nauk SSSR, 1(3):26-35. (Transl. by Consultants Bur., Div. of Plenum Publ. Corp. 227 W. 17th St., N.Y., N.Y. 10011, 1971, for sale upon request.)

Gray whale feeding studies are reviewed. Present article is based on materials and observations 1965-1969 in coastal waters of the Chukot Peninsula. Figure shows density of benthos and of gray whales in part of the Bering and Chukchi Sea. Regular gatherings of gray whales are observed in food-rich regions of the Gulf of Anadyr, Bering Strait, and the Chukchi Sea, but not in the food-poor southeastern Bering Sea. Absence of gray whales in certain areas of high density of benthos is explained by the low proportion of that benthos comprised by amphipods - the whales' primary food. Samples from 41 cows and 29 bulls were collected. List of foods found in stomachs includes 71 species. Dominant food items were amphipods of six species. It was noted that smaller animals kept closer to the shore than larger ones. No substantial differences were found between stomach contents of young and old animals, that of males and females, or that of whales taken from different areas. Seasonal changes in prey are noted, and also yearly differences in feeding. Calculations are given of quantity of food consumed by one animal per feeding (about 300 kg), per day (about 1200 kg), and per year (170 tons during 130-140 days of summer feeding). Estimating the total number of gray whales feeding in this area to be 5,000, food consumed would be 850,000 tons per year.

INDEX
SECTION

KEY TO INDEX CODES

In Species Index:

A = Abundance
D = Distribution
F = Feeding
Bf = Beaufort Sea
Ch = Chukchi Sea
Br = Bering Sea
Al = Aleutian Ridge
GA = Gulf of Alaska

In Area Index and Subject Index:

BA = Balaenoptera acutorostrata - minke whale
BB = Berardius bairdii - giant bottlenose whale
BG = Balaena glacialis - black right whale
BM = Balaenoptera musculus - blue whale
Bow = Balaena mysticetus - bowhead whale
BP = Balaenoptera physalus - fin whale
Cet = cetaceans (general) - whales, dolphins & porpoises
CU = Callorhinus ursinus - northern fur seal
DL = Delphinapterus leucas - beluga whale
EB = Erignathus barbatus - bearded seal
EJ = Eumetopias jubatus - northern (Steller) sea lion
ER = Eschrichtius robustus - gray whale
GG = Grampus griseus - Risso's dolphin
GM = Globicephala macrorhynchus - shortfin pilot whale
HG = Hydrodamalis gigas - great northern sea cow
LB = Lissodelphis borealis - northern right whale dolphin
LO = Lagenorhynchus obliquidens - Pacific white-sided dolphin
MN = Megaptera novaeangliae - humpback whale
Mon = Monodon monoceros - narwhal
MS = Mesoplodon stejnegeri - sabertooth whale
OO = Orcinus orca - killer whale
PD = Phocoenoides dalli - Dall porpoise
PF = Phoca fasciata - ribbon seal
PH = Phoca hispida - ringed seal
Phoc= phocid seals (general) - true (earless) seals
Pinn= pinnipeds (general) - seals, sea lions & walruses
PL = Phoca largha - larga seal
PM = Physeter macrocephalus - sperm whale
PP = Phocaena phocaena - harbor porpoise
PV = Phoca vitulina - harbor seal
SC = Stenella coeruleoalba - striped dolphin
Sei = Balaenoptera borealis - sei whale
UM = Ursus maritimus - polar bear
ZC = Ziphius cavirostris - goosebeak whale
Ziph= ziphiid whales (general) - beaked whales

CONTENTS OF THE INDEXES

SPECIES INDEX

M A R I N E M A M M A L S [MM]
(general)

1874	Scammon	D						
1920	Hanna	D				Br		
1923	Hanna	D				Br		
1926	Bailey & Hendee	D			Ch	Br		
1938	Barabash-Nikiforov	D					Al	
1942	Scheffer							
1956	Bee & Hall	D		Bf	Ch			
1957	Brooks							
"	Clarke	D						
1959	Murie	D				Br	Al	GA
1960	Kenyon	A	D			Br		
1963	Brooks							
1966	Fedoseev	A	D		Ch	Br		
"	Johnson, M.L. et al.		D		Ch			
1967	Nishiwaki		D		Ch	Br	Al	GA
"	Scheffer							
1969	Pike & MacAskie		D					GA
1972	Burgess		D			Br		
"	Kenyon	A	D			Br		
"	Moiseev		D					
1973	Burns & Morrow		D		Bf	Ch		
"	Scheffer	A						GA
1974	Fay		D			Br		
1975	Calkins et al.	A	D					GA
" a	Fay	A				Br		
" b	Fay				Ch	Br		
" a	Mar. Mammal Biol. Lab.		D			Br	Al	GA
"	Zhirnov et al.							
1976	Amer. Soc. Mammal.							
1977	Amer. Soc. Mammal.							
"	Berg					Br		
"	Braham, Everitt, et al.	A	D			Br		
"	Braham, Fiscus & Rugh				Ch	Br		
"	Fay					Br		
"	Lowry et al.			F	Bf			
"	Mercer et al.	A	D					GA
"	Natl. Mar. Fish. Serv.	A	D	F				
"	Rice		D					
1978a	Haley	A	D	F				
" b	Mitchell							
" a	Scheffer							
1979	Braham, Krogman et al.		D			Ch	Br	
in press	Brooks	A	D					
"	Chapman							
"	Fay							
"	Fay et al.					Br		GA
"	Ray							

P I N N I P E D S
(seals, sea lions, and walruses)

Callorhinus ursinus [CU] - (northern fur seal)

1915	Osgood et al.	A	D			Br		
1920	Hanna		D			Br		
1952	Kenyon			F				GA
"	Wilke & Kenyon		D	F				GA
1953	Alexander			F		Br		GA
"	Kenyon & Wilke		D					
1954	Wilke & Kenyon		D	F		Br	Al	GA
1955	Taylor et al.	A	D	F		Br	Al	GA
1956	Bee & Hall		D		Bf	Ch		
"	Schiller & Rausch		D					GA
1957	Brooks							
1958	Pike et al.	A	D	F				GA
"	Wilke et al.		D	F		Br		GA
1959	Murie		D			Br	Al	GA
"	Niggol et al.		D	F				
"	Pike et al.		D					GA
1960	Niggol et al.		D	F		Br	Al	GA
"	Pike et al.		D					GA
1961	Fiscus et al.		D	F				GA
"	Kenyon							
"	Pike et al.		D					GA
1962	Pike et al.		D					GA
1963	Jones		D			Br		GA
"	Pike et al.		D					GA
"	Roppel et al.	A						
1964	Fiscus et al.		D	F		Br	Al	
"	Spalding			F				GA
1965	Fiscus et al.		D	F		Br		
"	Fiscus & Kajimura		D	F		Br		GA
"	N. Pac. Fur Seal Comm.		D	F				
"	Pike et al.		D					GA
"	Roppel & Davey							
"	Roppel et al.	A						
"	Roppel Johnson & Chapman	A						
1966	Chugunkov & Prokhorov		D	F		Br		
"	Johnson, M.L. et al.		D		Ch			
" b	Panina			F				
"	Pike & MacAskie		D					GA
"	Pike et al.		D			Br		GA
"	Roppel et al.	A						
1967	Fiscus & Kajimura		D	F				GA
"	Pike & MacAskie		D					GA
"	Scheffer & Todd	A	D	F				
1968	Peterson et al.		D					
"	Pike & MacAskie		D					GA
"	Rovnin		D					
1969	Arsen'ev							
"	MacAskie		D					GA
"	Machida		D			Br	Al	
"	Mar. Mammal Biol. Lab.		D	F				
"	N. Pac. Fur Seal Comm.		D	F				
"	Peterson & LeBoeuf	A	D					
1970	Baker, Wilke & Baltzo	A	D	F				
"	MacAskie		D					GA
" a	Mar. Mammal Biol. Lab.	A	D	F		Br	Al	GA
" b	Mar. Mammal Biol. Lab.		D					GA
1971a	Arsen'ev		D					
" b	Arsen'ev		D					
"	Bigg & MacAskie							GA
"	Machida		D			Br	Al	
"	Harry	A						
" a	Mar. Mammal Biol. Lab.		D	F				GA
" b	Mar. Mammal Biol. Lab.	A	D	F				GA
"	N. Pac. Fur Seal Comm.		D	F				
"	Panina		D	F				
1972	Arsen'ev	A	D					
"	Bigg & MacAskie							GA
" a	Fiscus		D	F			Al	
" b	Fiscus	A	D	F		Br		GA
"	Ichihara & Yoshida			F				
"	Mar. Mammal Biol. Lab.	A	D					GA
"	Vladimirov		D					
1973	Chapman	A						
"	Kuzin et al.	A	D					
"	Lentfer		D			Ch		
"	Mar. Mammal Div.	A	D	F				GA
"	Scheffer	A						GA
1974	Anas							
"	Bigg & MacAskie							GA

C. ursinus (cont.)

"	Mar. Mammal Div.	A	D			Br		
1975	Bigg & MacAskie							GA
"	Borodin & Vladimirov	A					Al	
"	Johnson, A.M.	A						
"	Kuzin	A	D					
"	Lander	A						
"	Mar. Mammal Div.		D	F		Br		
"	N. Pac. Fur Seal Comm.		D	F				
"	Pitcher		D					GA
1976	Kooyman,Gentry&McAlister							
"	Kooyman,Gentry& Urquhart	9		F				
"	Lander & Kajimura	A	D	F				
"	Mar. Mammal Div.	A		F		Br		
1977	Bogdanov et al.					Br		
"	Gentry			F				
"	Kajimura et al.		D	F				
"	Mar. Mammal Div.	A		F		Br		
1978	Fiscus							
"	Mar. Mammal Div.	A		F		Br		
in press	York					Br		

Erignathus barbatus [EB] - bearded seal

1885	Murdoch	A	D		Bf	Ch		
1923	Hanna		D				Br	
1926	Bailey & Hendee		D			Ch	Br	
1947	Rainey		D			Ch		
1956	Bee & Hall		D		Bf	Ch		
1957	Brooks							
1960	Fay							
" a	Kenyon	A	D				Br	
1962b	Kenyon		D	F			Br	
1963	Brooks			F				
"	Tarasevich		D	F				
1964a	Tikhomirov		D	F			Br	
1965a	Burns							
" c	Burns		D					
"	Foote					Ch		
1966	Burns							
"	Fedoseev		D			Ch		
"	Johnson, M.L. et al.		D	F		Ch		
" a	Kosygin		D	F			Br	
" b	Kosygin		D				Br	
" c	Kosygin		D				Br	
"	Saario & Kessel		D			Ch		
" a	Tikhomirov		D				Br	
" b	Tikhomirov		D			Ch	Br	
" b	Tikhomirov & Kosygin		D				Br	
1967a	Burns	A	D	F		Ch	Br	
" b	Burns		D					
"	Shustov	A					Br	
1968	Tikhomirov		D	F			Br	
1970	Burns		D			Ch	Br	
1971	Kosygin			F			Br	
1972	Burgess		D				Br	
"	Kenyon	A	D				Br	
"	Shustov	A	D					
1973	Burns		D					
1974b	Stirling				Bf			
1975	Kosygin	A	D				Br	
"	Potelov							
"	Ray, D.J.		D			Ch	Br	
"	Stirling et al.	A	D		Bf			
1976	Kooyman,Gentry&McAlister							
"	Popov	A	D	F			Br	
1977	Braham, Everitt et al.	A	D				Br	
"	Braham, Krogman & Fiscus		D		Bf	Ch		
"	Burns & Eley	A	D		Bf	Ch	Br	
"	Burns, Shapiro & Fay		D					
"	Eley				Bf	Ch		
" a	Lowry et al.			F	Bf			
" b	Lowry et al.			F	Bf	Ch	Br	
"	Stirling & Archibald				Bf			
1978	Burns							
in press	Lowry et al.			F			Br	
"	Marquette				Bf	Ch		

Eumetopias jubatus [EJ] - northern (Steller) sea lion

1871	Scammon		D			Br		
1915	Osgood et al.	A	D			Br		
1945	Scheffer		D			Br		
1947	Imler & Sarber	A	D	F				GA
1952	Kenyon			F				GA
"	Wilke & Kenyon		D	F		Br		
1956	Schiller & Rausch		D					GA
1957	Brooks							
1958	Fay		D			Br		
"	Pike & Maxwell	A	D					GA
1959	Daetz		D					GA
"	Mathisen	A	D	F		Br	Al	GA
"	Murie		D			Br	Al	GA
"	Tikhomirov			F				
1961	Kenyon & Rice	A	D			Br	Al	GA
"	Pike	A	D	F				GA
"	Thorsteinson et al.							
1962	Fiscus & Scheffer		D	F			Al	GA
" a	Kenyon	A	D			Br		
"	Mathisen et al.			F				GA
"	Thorsteinson & Lensink		D	F				GA
1963	Brooks	A		F				
"	Mathisen & Lopp	A	D				Al	GA
1964	Spalding			F				GA
" a	Tikhomirov		D	F		Br		
" b	Tikhomirov	A	D	F		Br		
1965	Kenyon	A	D			Br	Al	
1966	Chugunkov & Prokhorov		D	F		Br		
"	Fiscus & Baines		D	F		Br		GA
" a	Panina			F				
" b	Tikhomirov & Kosygin		D			Br		
1967	Vania & Klinkhart		D					GA
1968	Rice							
"	Vania et al.		D					GA
1969	Peterson & LeBoeuf	A	D					
1971	Branson					Br		
"	Prasil	A	D					GA
1972	Burgess		D			Br		
" a	Fiscus		D	F			Al	
1973	Kuzin et al.		D					
"	Scheffer	A						GA
1974	Mar. Mammal Div.			F				
1975	Barr	A		F				
"	Calkins et al.	A	D					GA
"	Carlson							GA
" b	Mar. Mammal Div.			F				
"	Pitcher	A	D					GA
"	Sandegren							GA
1976	Mar. Mammal Div.			F				
1977	Braham et al.	A	D			Br	Al	
"	Braham, Everitt et al.	A	D				Al	
" a	Calkins & Pitcher	A	D	F				GA
"	Gentry			F				
"	Mercer et al.	A	D					GA
1978	Gentry & Withrow							

Mirounga angustirostris [MA] - northern elephant seal

1912	Townsend							
1924	Anthony	A	D					
1945	Cowan & Carl		D					GA
1952	Bartholomew							
1960	Bartholomew & Hubbs	A	D					
1963	Brooks	A						
"	Scheffer & Kenyon		D					
1968	Rice							
1969	Peterson & LeBoeuf	A	D					
1970	Morejohn & Baltz			F				
"	Calkins & Pitcher		D					GA
1977	Gogan	A	D	F				GA
1978	DeLong							

Odobenus rosmarus [OR] - walrus

1872	Murie, J.									
1872	Scammon									
1885	Murdoch	A	D		Bf	Ch				
1920	Hanna		D				Br			
1923	Hanna		D				Br			
1926	Bailey & Hendee		D			Ch	Br			
1941	Nikulin		D	F		Ch	Br			
1947	Nikulin		D			Ch	Br			
"	Rainey		D			Ch				
1952	Fay		D	F			Br			
1953	Fay						Br			
1954	Brooks	A	D	F		Ch	Br			
"	Fay		D							
1955	Fay	A	D	F		Ch	Br			
1956	Bee & Hall		D		Bf	Ch				
1957	Brooks									
"	Fay	A								
1958	Fay						Br			
1959	Murie		D	F			Br	Al	GA	
"	Scott et al.	A								
1960	Fay			F						
" b	Kenyon	A	D				Br			
" d	Kenyon						Br			
1962	Fedoseev	A	D			Ch	Br			
"	Krylov					Ch				
1963	Burns & Croxton	A	D							
1964a	Tikhomirov		D	F			Br			
1965a	Burns									
" b	Burns	A	D	F		Ch	Br			
" c	Burns	A	D							
"	Foote					Ch				
"	Kenyon		D				Br	Al		
1966	Burns		D							
"	Fedoseev	A	D			Ch	Br			
"	Johnson, M.L. et al.		D			Ch				
"	Krylov		D			Ch	Br			
"	Saario & Kessel		D			Ch				
1967b	Burns	A	D				Br			
1968	Branson		D						GA	
"	Gol'tsev	A	D			Ch	Br			
"	Krylov	A	D			Ch				
1970	Burns		D			Ch	Br			
1971	Frame		D	F	Bf	Ch				
"	Krylov			F		Ch				
1972	Burgess		D				Br			
"	Gol'tsev	A	D			Ch	Br			
"	Kenyon	A	D				Br			
"	Shustov	A	D							
1973	Scheffer	A							GA	
1975a	Fay			F						
" b	Fay									
"	Fiscus & Marquette				Bf	Ch				
1975	Kosygin	A	D			Ch	Br			
"	Miller		D				Br			
"	Ray, D.J.		D			Ch	Br			
"	Ray, G.C. & Watkins						Br			
"	Tomilin & Kibal'chich	A	D	F		Ch				
1976	Fedoseev									
"	Marquette					Ch				
"	Golt'sev	A	D			Ch	Br			
"	Miller		D				Br			
"	U.S. Fish Wildl. Serv.	A	D			Ch	Br			
1977	Braham et al.	A	D				Br			
"	Braham,Krogman & Fiscus		D		Bf	Ch				
"	Burns									
"	Burns, Shapiro & Fay		D							
"	Estes	A								
"	Fay						Br			
"	Fay et al.	A		F			Br			
" a	Lowry et al.			F	Bf					
"	Ray. G.C. & Wartzok		D	F		Ch				
"	Reeves	A				Ch	Br			
1978	Estes & Gilbert					Ch				
" b	Kenyon									
"	Krogman et al.	A	D			Ch	Br			
in press	Brower									
"	Fay & Ray						Br			
"	Fay et al.						Br			
"	Marquette				Bf	Ch				
"	Ray									

Phoca fasciata [PF] - ribbon seal

1873	Gill		D						
1885	Murdoch	A	D		Bf	Ch			
1928	Bailey		D				Br		
1941	Arsen'ev		D	F					(Okh.)
1956	Bee & Hall		D		Bf	Ch			
1957	Brooks								
1960a	Kenyon	A	D				Br		
1963	Brooks	A							
1964a	Tikhomirov		D	F			Br		
1965a	Shustov		D				Br		
" b	Shustov	A					Br		
" c	Shustov		D	F			Br		
" d	Shustov		D			Ch	Br		
1966	Johnson, M.L. et al.		D			Ch			
" b	Kosygin		D				Br		
" c	Kosygin		D				Br		
" a	Tikhomirov		D				Br		
" b	Tikhomirov		D			Ch	Br		
" a	Tikhomirov & Kosygin		D				Br		
" b	Tikhomirov & Kosygin		D				Br		
1967	Shustov	A					Br		
" b	Burns		D						
1968	Tikhomirov		D	F			Br		
1969	Shustov	A	D				Br		
1970	Burns		D			Ch	Br		
1972	Burgess		D				Br		
"	Kenyon	A	D				Br		
"	Shustov	A	D						
1973	Burns		D						
"	Fedoseev	A	D				Br		(Okh.)
1975	Kosygin	A	D				Br		
1976	Fedoseev & Shmakova		D				Br		
"	Popov	A	D	F			Br		
1977	Braham et al.	A	D				Br		
"	Burns. Shapiro & Fay		D						
" b	Lowry et al.			F	Bf	Ch	Br		
"	Watkins & Ray	A	D				Br		
1978	Burns								
in press	Lowry et al.			F			Br		

Phoca hispida [PH] - ringed seal

1885	Murdoch	A	D		Bf	Ch		
"	Ray, P.H.	A	D		Bf	Ch		
1926	Bailey & Hendee		D			Ch	Br	
1946	Pikharev			F				
1947	Rainey		D			Ch		
1956	Bee & Hall		D		Bf	Ch		
1957	Brooks							
1959	Tikhomirov							
1960	Fay							
" a	Kenyon	A	D				Br	
" c	Kenyon		D				Br	
1962b	Kenyon		D	F			Br	
"	Thomas & Scheffer		D				Br	
1963	Brooks			F				
1965	Foote					Ch		
1966	Burns							
"	Fedoseev		D			Ch		
"	Johnson, M.L. et al.		D	F		Ch		
"	Saario & Kessel		D			Ch		
" a	Tikhomirov		D				Br	
" b	Tikhomirov		D			Ch	Br	
" a	Tikhomirov & Kosygin		D			Ch		
" b	Tikhomirov & kosygin		D				Br	
1967b	Burns		D					
1968	Tikhomirov		D	F			Br	
1970	Burns		D			Ch	Br	
"	Fedoseev & Nazarenko						Br	
"	Mansfield	A						
1972	Burgess		D				Br	
"	Burns & Harbo	A	D		Bf	Ch		
"	Kenyon	A	D				Br	
"	Shustov	A	D					
1973	Burns		D					
" a	Smith		D					
" b	Smith		D					
1974	Smith	A			Bf			
" b	Stirling				Bf			
1975	Fedoseev		D			Ch	Br	(Okh.)
"	Fiscus & Marquette				Bf	Ch		
"	Kosygin	A	D				Br	
"	Øritsland							
"	Potelov							
"	Ray, D.J.		D			Ch	Br	
"	Smith & Geraci				Bf			
"	Smith & Stirling		D					
"	Stirling et al.	A	D		Bf			
"	Zhirnov et al.							
1976	Geraci & Smith				Bf			
"	Marquette					Ch		
"	Popov	A	D	F			Br	
1977	Braham et al.	A	D				Br	
"	Braham, Krogman & Fiscus		D		Bf	Ch		
"	Burns & Eley	A	D		Bf	Ch	Br	
"	Burns, Shapiro & Fay		D					
"	Eley				Bf	Ch		
"	Engelhardt et al.							
"	Fay						Br	
" a	Lowry et al.			F	Bf			
" b	Lowry et al.			F	Bf	Ch	Br	
"	Stirling & Archibald				Bf			
1978	Burns							
"	Lowry et al.			F	Bf	Ch		
in press	Lowry et al.			F			Br	
"	Marquette				Bf	Ch		

Phoca largha [PL] - largha seal, spotted seal
and/or
Phoca vitulina [PV] - harbor seal, common seal

1885	Murdoch	A	D		Bf	Ch			
1926	Bailey & Hendee		D			Ch	Br		
1928	Bailey		D				Br		
1947	Imler & Sarber	A	D	F					GA
1956	Bee & Hall		D		Bf	Ch			
"	Schiller & Rausch		D						GA
1957	Brooks								
1958	Fay		D				Br		
1959	Murie		D				Br	Al	GA
1963	Brooks			F					
"	Mathisen & Lopp								GA
1964	Spalding			F					GA
" a	Tikhomirov		D	F			Br		
1965	Foote					Ch			
"	Kenyon	A	D				Br	Al	
1966	Burns								
"	Johnson M.L. et al.		D			Ch			
" b	Kosygin		D				Br		
" a	Panina			F					
" a	Tikhomirov		D				Br		
" b	Tikhomirov		D			Ch	Br		
" b	Tikhomirov & Kosygin		D				Br		
1967	Bishop	A	D	F					GA
" b	Burns		D						
"	Chapskii						Br		
"	Klinkhart								GA
"	Shustov	A					Br		
"	Vania & Klinkhart		D				Br		GA
1968	Tikhomirov		D	F			Br		
"	Vania et al.	A	D				Br		GA
1969	Bigg	A	D	F					GA
"	Klinkhart	A	D				Br		GA
1970	Burns		D			Ch	Br		
1971	Prasil	A	D						GA
1972	Burgess		D				Br		
"	Burns, Ray et al.		D				Br		
"	Kenyon	A	D				Br		
"	Shustov	A	D						
1973	Burns		D						
"	Burns & Fay		D		Bf	Ch	Br	Al	
"	Scheffer	A							GA
1974	Anas								
1975	Calkins et al.	A	D						GA
"	Gol'tsev et al.		D				Br		
"	Kosygin	A	D			Ch	Br		
"	Pitcher	A	D						GA
"	Ray. D.J.		D			Ch	Br		
"	Shaughnessy								
"	Zhirnov et al.								
1976	Fedoseev & Shmakova		D				Br		
"	Naito		D			Ch	Br		GA
"	Popov	A	D	F			Br		
1977	Beier & Wartzok								
"	Braham, Everitt et al.	A	D				Br		
"	Burns & Harbo	A	D				Br		
"	Burns, Shapiro & Fay		D						
"	Fay						Br		
"	Jeffries et al.								
"	Johnson, B.W.								GA
" a	Lowry et al.			F	Bf				
" b	Lowry et al.			F	Bf	Ch	Br		
"	Pitcher		D	F					GA
"	Pitcher & Calkins	A	D	F					GA
"	Scheffer						Br		
1978	Burns								
"	Newby								
in press	Brower								
"	Everitt & Braham	A	D				Br	Al	
"	Lowry et al.			F			Br		

Phocidae [Phoc] - true (earless) seals

1920	Hanna		D			Br		
1961	Tikhomirov		D		Ch	Br		(Okh)
1962b	Kenyon		D			Br		
1966b	Kosygin		D			Br		
"	a Tikhomirov		D			Br		
"	b Tikhomirov		D		Ch	Br		
"	b Tikhomirov & Kosygin		D			Br		
1968	Tikhomirov		D	F		Br		
1970	Burns		D		Ch	Br		
1972	Shustov	A	D					
1973	Burns		D					
"	Sergeant							
1976	Fedoseev							
"	Popov	A	D	F		Br		
1977	Burns							
"	a Lowry et al.			F	Bf			
"	b Lowry et al.			F	Bf	Ch	Br	
1978 in press	Burns							
	Lowry et al.			F		Br		

Pinnipedia (general) [Pinn] - seals, sea lions, & walruses

1935	Barabash-Nikiforov		D				Al	
1955	Kenyon & Scheffer							
1958	Scheffer	A	D	F				
1964a	Tikhomirov		D	F		Br		
1975	Kosygin	A	D		Ch	Br		
"	Tikhomirov					Br		
1977	Burns, Shapiro & Fay		D		Ch	Br		

O T H E R C A R N I V O R E S
(polar bear, sea otter)

Ursus maritimus [UM] - polar bear

1885	Murdoch	A	D		Bf	Ch		
1920	Hanna	A	D			Br		
1926	Bailey & Hendee		D		Ch	Br		
1956	Bee & Hall		D		Bf	Ch		
1959	Scott et al.	A						
1960	Fay			F				
"	a Kenyon	A	D			Br		
1963	Brooks							
1965	Foote					Ch		
1966	Fedoseev		D			Ch		
"	Johnson, M.L. et al.		D			Ch		
"	Polar Record	A	D		Bf	Ch	Br	
1967	Lentfer et al.	A	D	F	Bf	Ch		
1969	Uspensky & Shilnikov	A	D					
1970	Lentfer		D		Bf	Ch		
1971	Frame	A	D		Bf	Ch		
"	Lentfer	A	D		Bf	Ch		
"	Nikulin			F		Ch	Br	
1974	Lentfer		D		Bf	Ch		
"	a Stirling			F				
"	b Stirling		D	F	Bf			
1975	Lentfer		D		Bf	Ch		
"	Zhirnov et al.							
1976	Beyland & Hay			F				
"	Marquette					Ch		
"	U.S. Fish Wildl. Serv.	A	D		Bf	Ch	Br	
1977	Braham, Krogman & Fiscus		D		Bf	Ch		
"	Burns							
"	Burns & Eley			F				
"	Eley			F	Bf	Ch		
"	a Lowry et al.			F	Bf			
"	Ray & Wartzok		D	F		Ch		
"	Stirling & Archibald			F	Bf			
1978 in press	Lentfer							
	Brower							
"	Marquette				Bf	Ch		

Enhydra lutris [EL] - sea otter

1870	Scammon		D				Al	
1915	Osgood et al.	A	D			Br		
1923	Hanna		D			Br		
1935	Barabash-Nikiforov	A	D	F			Al	
1950	Scheffer & Wilke							
1951	Scheffer							
1953b	Scheffer			F				GA
1955	Kenyon & Scheffer							
1959	Murie		D	F		Br	Al	GA
1960	Lensink	A	D				Al	GA
"	Nikolaev	A	D				Al	
1961b	Kenyon							
"	Nikolaev	A	D	F			Al	GA
1962	Johnson, M.L. & Alcorn	A	D				Al	GA
1963	Brooks							
1965	Burns & Croxton						Al	
"	Kenyon	A	D			Br	Al	
"	Nikolaev			F			Al	
1967	Johnson, M.L. et al.							
"	Vania & Klinkhart		D					GA
1968	Vania et al.	A	D				Al	
1971	Nikolaev		D				Al	
"	Prasil	A	D					GA
1972	Kenyon	A	D			Br		
1973	Sandegren et al.			F				
"	Scheffer	A						GA
1975	Calkins & Lent							GA
"	Calkins et al.	A	D					GA
"	Pitcher	A	D					GA
"	Sherrod et al.						Al	
"	Zhirnov et al.							
1976	Kooyman, Gentry &McAlister							
"	Schneider & Faro		D			Br		
"	U.S. Fish Wildl. Serv.	A	D				Al	GA
1977	Amer. Soc. Mammal.							
"	Fay					Br		
1978a in press	Kenyon							
	Fay et al.					Br		

S I R E N I A N S

Hydrodamalis gigas [HG] - great northern sea cow

1963	Berzin et al.					Br		
1978b	Haley							

C E T A C E A N S
(whales, dolphins, and porpoises)

Balaena glacialis [BG] - black right whale

1931	Kellogg								
1935	Townsend			D			Br	Al	GA
1955	Sleptsov	A	D						
"	Zenkovich			D				Al	
1956	Gilmore			D			Br		GA
1958	Omura	A	D				Br	Al	GA
1959	Nemoto			D	F				
1960	Nasu			D		Ch			
1962	Klumov	A	D	F					
1965	Nemoto & Kasuya			D	F				GA
1966	Berzin & Rovnin			D					
1967	Ivashin & Rovnin			D					
1969	Omura et al.	A	D	F		Ch	Br	Al	GA
1971	Ohsumi et al.	A							
1973	Scheffer	A							GA
1974	Allen	A							
"	Ohsumi & Wada	A	D						
" b	Rice	A	D						
1975	Berzin & Kuz'min			D					(Okh.)
"	Kuz'min & Berzin			D					(Okh.)
"	Tillman	A							
"	Wada	A	D						
"	Zhirnov et al.								
1976	IWC - (Japan)			D					
"	Wada	A	D						
1977	Wada	A	D						
"	IWC - (Japan)			D					
1978a	Gilmore								

Balaena mysticetus [BOW] - bowhead whale; Greenland right whale

1885	Murdoch	A	D			Bf	Ch			
"	Ray, P.H.	A	D			Bf	Ch			
1920	Hanna			D					Br	
1926	Bailey & Hendee			D				Ch	Br	
1931	Kellogg									
1935	Townsend			D		Bf	Ch	Br		
1940	Rainey	A	D				Ch			
1946	Nikulin	A	D				Ch	Br		
1947	Rainey	A	D				Ch			
1956	Bee & Hall			D		Bf	Ch			
1957	Brooks									
1959	Nemoto			D	F					
1960c	Kenyon	A	D						Br	
1961a	Sleptsov	A	D				Ch			
1963	Maher & Wilimovsky			D		Bf	Ch			
1965	Foote						Ch			
1966	Fedoseev			D			Ch			
"	Johnson M.L. et al.			D			Ch			
"	Saario & Kessel			D			Ch			
1968	Heizer									
1971	Mansfield			D						
1972	Burgess			D					Br	
" a	Durham									
" b	Durham									
" c	Durham									
"	Kenyon	A	D						Br	
1973	Durham									
1974b	Rice	A	D							
"	Smith	A				Bf				
1975	Berzin & Kuz'min			D						(Okh.)
"	Bockstoce					Bf				
"	Durham									
"	Kuz'min & Berzin			D				Ch	Br	
"	Ray, D.J.	A	D					Ch	Br	
"	Zhirnov et al.									
1976	Marquette					Bf	Ch	Br		
1977	Bockstoce					Bf	Ch	Br		
"	Braham & Krogman	A	D			Bf	Ch	Br		
"	Braham, Krogman & Fiscus	A	D			Bf	Ch	Br		
"	Burns									
"	Krogman			D		Bf				
"	Loken									
" a	Lowry et al.				F	Bf				
"	Marquette	A	D		F	Bf	Ch	Br		
"	Morgan									
"	Nakashim			D		Bf	Ch			
"	Tillman	A								
1978	Braham & Leatherwood									
"	Fraker et al.	A	D		F	Bf				
"	Lowry et al.				F	Bf	Ch			
"	Marquette									
1979	Braham, Krogman et al.	A	D			Bf	Ch	Br		
"	Durham					Bf	Ch			
in press	Braham et al.	A	D			Bf	Ch	Br		
"	Brower									
"	Everitt & Krogman					Bf				
"	Marquette				F	Bf	Ch	Br		

Balaenoptera acutorostrata [BA] - minke whale; little piked whale; lesser rorqual

1931	Kellogg								
1939	Cowan								
1946	Nikulin		D			Ch	Br		
1949	Scattergood		D	F		Ch	Br	Al	GA
1955	Zenkovich		D						
1959	Nemoto		D	F					
1961a	Sleptsov	A	D			Ch			
"	b Sleptsov		D	F			Br	Al	
1965	Kenyon		D				Br	Al	
1968a	Jonsgard		D						
"	Rice								
1973	Scheffer	A							GA
1974	Doroshenko et al.								
"	Ohsumi & Wada	A	D						
"	b Rice	A	D						
1975	Fiscus & Marquette		D		Bf	Ch	Br		
"	Kawamura		D				Br	Al	
"	Mitchell								
"	Pitcher		D						GA
"	Sergeant			F					
"	Wada	A	D				Br	Al	GA
1976	Wada	A	D				Br	Al	GA
1977	Braham, Everitt et al.		D				Br		
"	Fay						Br		
"	Hall & Tillman	A	D						GA
"	Wada	A	D				Br	Al	GA
1978a	Mitchell								
1979	Braham, Krogman et al.		D				Br		

Balaenoptera borealis [SEI] - sei whale

1931	Kellogg								
1940	Thompson			F				Al	
1953	Sakiura et al.		D	F				Al	
1955	Omura	A	D				Br	Al	
"	Sleptsov	A	D						
"	Zenkovich		D						
1956	Uda & Nasu		D					Al	
1957	Nemoto		D	F				Al	
1958	Kawakami & Ichihara		D						
1959	Murie		D				Br	Al	GA
"	Nemoto		D	F					
1961a	Sleptsov	A	D			Ch			
1963	Nasu		D						
"	Nemoto		D	F			Br	Al	GA
"	Rice		D						
1964	Omura & Ohsumi		D				Br	Al	GA
1965	Nemoto & Kasuya		D	F					GA
1966	Nasu		D				Br	Al	GA
"	Nishiwaki	A	D				Br	Al	GA
1967	Doi et al.	A							
"	Ivashin & Rovnin		D						
"	Whales Research Inst.		D						
1970	Machida							Al	
"	Shurunov		D	F				Al	GA
1971	Gill & Hughes			F					
"	Ohsumi et al.	A							
"	Zenkovich	A	D						
1973	Scheffer	A							GA
1974	Int. Comm. Whaling		D						
"	Ohsumi & Wada	A	D						
"	Omura & Ohsumi	A	D						
"	b Rice	A	D						
1975	Brown		D						
"	Ohsumi & Fukuda	A							
"	Tillman	A							
"	Wada	A	D				Br	Al	GA
1976	Masaki		D						
"	Wada	A	D				Br	Al	GA
1977	Braham, Everitt et al.		D				Br		
"	Hall & Tillman	A	D						GA
"	Mercer et al.	A	D						GA
"	Rice		D	F					
"	Wada	A	D				Br	Al	GA
1978a	Mitchell								

Balaenoptera musculus [BM] - blue whale

1920	Hanna		D				Br		
1931	Kellogg								
1940	Thompson			F				Al	
1953	Sakiura et al.		D	F				Al	
1955	Omura	A	D				Br	Al	
"	Sleptsov	A	D						
"	Zenkovich		D						
1956	Ruud								
"	Uda & Nasu		D					Al	
1957	Nemoto		D	F				Al	
1958	Kawakami & Ichihara		D						
1959	Murie		D				Br	Al	GA
"	Nemoto		D	F					
1960	Fujino								
1961a	Sleptsov	A	D			Ch			
1963	Nasu		D						
"	Rice		D						
1964	Omura & Ohsumi		D				Br	Al	GA
1965	Nemoto & Kasuya		D	F					GA
1966	Berzin & Rovnin		D						
"	Nasu		D				Br	Al	GA
"	Nishiwaki	A	D				Br	Al	GA
1967	Doi et al.	A							
1967	Ivashin & Rovnin		D						
"	Whales Res. Inst.		D						
1971	Doroshenko								GA
"	Ohsumi et al.	A							
"	Small								
"	Zenkovich	A	D						
1972	Ohsumi & Wada	A	D					Al	GA
1973	Scheffer	A							GA
1974	Ohsumi & Wada	A	D						
"	Omura & Ohsumi	A	D						
"	b Rice	A	D						
1975	Tillman	A							
"	Wada	A	D				Br	Al	GA
"	Zhirnov et al.								
1976	Int. Whaling Comm.		D						GA
"	Wada	A	D				Br	Al	GA
1977	Int. Whaling Comm.		D						GA
"	Mercer et al.	A	D						GA
"	Wada	A	D				Br	Al	GA
1978a	Mitchell								
"	b Rice								

Balaenoptera physalus [BP] - fin whale

1909	Andrews			F				GA
1930	Howell & Huey			F				
1931	Kellogg							
1940	Thompson			F			Al	
1946	Nikulin		D			Ch	Br	
1953	Sakiura et al.		D	F			Al	
1954	Fujino							
1955	Omura	A	D				Br	Al
"	Sleptsov	A	D					
"	Zenkovich		D				Br	Al
1956	Uda & Nasu		D				Al	
1957	Nemoto		D	F			Al	
1958	Kawakami & Ichihara		D					
"	Ohsumi et al.						Al	
1959	Murie		D				Br	Al GA
"	Nemoto		D	F			Br	Al GA
1960	Fujino							
"	Nasu		D			Ch		
1961a	Sleptsov	A	D			Ch		
" b	Sleptsov		D	F			Br	Al
1963	Nasu		D					
"	Rice		D					
1964	Omura & Ohsumi		D				Br	Al GA
1965	Nemoto & Kasuya		D	F				GA
1966	Berzin & Rovnin		D					
"	Fedoseev		D				Br	
1966	Nasu		D				Br	Al GA
"	Nishiwaki	A	D				Br	Al GA
1967	Doi et al.	A						
"	Ivashin & Rovnin		D					
"	Whales Res. Inst.		D					
1970	Shurunov		D	F			Al	GA
1971	Doroshenko							GA
"	Ohsumi et al.							
"	Zenkovich	A	D					
1973	Scheffer	A						GA
1974	Allen	A						
"	Int. Comm. Whaling		D					
"	Ohsumi & Wada	A	D					
"	Omura & Ohsumi		D					
" b	Rice	A	D					
1975	Brown		D					
"	Kawamura		D				Br	Al
"	Tillman	A						
"	Wada	A	D				Br	Al GA
"	Zhirnov et al.							
1976	Wada	A	D				Br	Al GA
1977	Braham, Everitt et al.		D				Br	
"	Hall & Tillman	A	D					GA
"	Mercer et al.	A	D					GA
"	Wada	A	D				Br	Al GA
1978a	Mitchell							
1979	Braham, Krogman et al.		D				Br	

Berardius bairdii [BB] - Baird's beaked whale; giant North Pacific bottlenose whale

1920	Hanna		D				Br	
1923	Hanna		D				Br	
1931	Kellogg							
1949a	Scheffer		D					Al
1953	Pike		D	F				GA
"	Slipp & Wilke		D	F				
1955	Zenkovich		D					Al
1961a	Sleptsov	A	D			Ch		
" b	Sleptsov		D	F			Br	
1963	Rice		D					
1971	Kasuya							
1974b	Rice	A	D					
1975	Ohsumi		D					
1976	Ohsumi. Masaki & Wada		D				Br	Al GA
1977	Hall & Tillman		D					GA
1978a	Rice							

Cetacea (general) [Cet]

1931	Kellogg		D					
1935	Townsend		D					
1940	Thompson			F				Al
1946	Nikulin		D			Ch	Br	
1948	Scheffer & Slipp		D	F				
1954	Uda		D	F				
1955	Omura	A	D				Br	Al
"	Sleptsov	A	D					
"	Zenkovich		D				Br	Al
1956	Uda & Nasu		D					Al
1957	Nemoto		D	F				Al
"	Tomilin		D	F				
1958	Kawakami & Ichihara		D					
1959	Murie		D				Br	Al GA
"	Nemoto		D	F				
1960	Tomilin		D					
1961a	Sleptsov	A	D			Ch		
" b	Sleptsov		D	F			Br	Al
1962	Gudkov			F			Br	
1963	Nasu		D			Ch	Br	Al
"	Rice		D					
1964	Omura & Ohsumi		D				Br	Al GA
1966	Berzin & Rovnin		D	F		Ch	Br	Al GA
"	Nasu		D				Br	Al GA
"	Nishiwaki	A	D				Br	Al GA
1967	Doi et al.	A						
1967	Ivashin & Rovnin		D					
"	Whales Res. Inst.		D					
1968	Tomilin & Smyshlyayev							
1970	Shurunov		D	F				
1971	Kasuya							
"	Ohsumi et al.	A						
"	Zenkovich	A	D					
1972	Ivashin et al.							
"	Leatherwood		D	F				
1973	Chapman	A						
1974	Allen	A						
"	Brown		D					
"	Gulland		D	F				
"	Int. Comm. Whaling		D					
"	Ohsumi & Wada	A	D					
"	Omura & Ohsumi	A	D					
" b	Rice	A	D					
1975	Brown		D					
"	Kawamura		D				Br	Al
"	Mitchell							
"	Tillman	A						
"	Wada	A	D				Br	Al GA
1976	Wada	A	D				Br	Al GA
1977	Hall & Tillman	A	D					GA
"	Wada	A	D				Br	Al GA

De	hi	pt	us	euc	]	be	ga	ha					
18		am	n										
18		rd	h				D		Ch				
19		il	&	enc			D		Ch	r			
19		ll	g										
19		ku	n				D		Ch	r			
19		in					D		Ch				
19		e	Hal				D		Ch				
19		ool											
19	a	ny					D			r			
19	a	ep	yv				D		Ch				
19		ool					D			r			
19		ei	nb	e	al		D		Ch	r			
19		ot							Ch				
19		io	ev				D		Ch				
"		hn	a.	L.	t	.	D		Ch				
"		ml	ar				D		Ch	r	G		
"		ar	&	ss			D		Ch				
19		ai	&	nk	rt		D			r			
"		ai	st	.			D			r			
19		rg	at	Br	ie		D						
19		rg	a				D			r			
"		ny					D			r			
19		fi	&	ro	e		D						
"		ei	er								G		
19		tl											
19		cu	&	rq	tt				Ch				
"		ch	l										
"		7,	J.				D		Ch	r			
"		rg	at	Br	ie		D			r	G		
19		la	&	ay									
"		qu	te						Ch				
19		ha	&	og	n		D		Ch	r			
"		ha	K	gm	&	is	D		Ch	r			
"		ns											
"		ki	&	it	er		D				G		
"		7								r			
"		ll	Ti	ma			D				G		
"		ry	t	.									
19		7											
"		ke	et	l.			D						
19		ha	K	gm	e	al			Ch	r			
ir		we											
"		qu	te					B	Ch				

Es	ri	ti	ro	st	[	]	gr	wt	e				
18		am	n										
19		ll	&	nd				D		Ch	r		
19		el	&	ey									
19		ll	g										
19		ns	ad					D					
19		tu	n					D		Ch	r		
19		ko	ch					D			r		
19		e &	lal					D	E	Ch			
19		ok											
19		it	ta					D			r		
19		mc						D		Ch	r		
"		ot						D					
19		er						D	E	Ch			
"		u						D		Ch	r		
19	s	ep	ov					D		Ch			
"		ke	F	cu				D		Ch	r	G	
19		te						D		Ch	r	G	
19		y									r		
19	c	ns						D	E	Ch			
"		m	en	H	d								
"		te						D		Ch	r		
19		zi	&	vn				D					
"		lo	w					D		Ch			
19		sh	&	ov	n			D					
19		se											
19		te	Wo	an									
"	a	us	to										
"	b	us	to										
19		sr	v					D			G		
"	a	us	to					D		Ch	r		
"	b	us	to										
"	c	us	to										
"		us	to	Le	ka			D		Ch	r		
19		te	Wo	an				D	E	Ch	r	G	
"		ko	ch					D					
"		us	to										
19		dr	ge										
"		ge						D			r		
19		en	v	a				D					
"		ef	r									G	
19		en											
"		le	&	rl	g			D				G	
"	a	te											
"	b	te						D					
"		ud	O'	nn				D					
19		zi	&	z'	n			D					
"		wn						D					
"	a												
"		'm	&	er	n			D		Ch	r		
"		ho											
"		te						D					
"		ud											
"		lm											
"		rn	e	al									
19		um											
19		ha						D			r	G	
"		ha	E	ri	e	al.		D			r		
"		ha	K	gm	&	ls	a	D	B	Ch			
"		wn	l					D					
"											r		
"		l	a					D				G	
"		l	Ti	ma				D				G	
"		t						D				G	
"		lm											
19	G	mc						D				G	
"		e											
19		ha	K	gm	e	al.		D			r		
ir		e	al								r		
"		h	Br	m				D			r		

(C ..)

Globicephala macrorbynchus [GM] - pilot whale

1961b	Sleptsov	D	F		Br	Al
1971	Bree					
"	Kasuya					
1975	Mitchell					
"	Ohsumi	D				
1976	Spotte	D	F			GA
1978	Reilly					

Grampus griseus [GG] - Risso's dolphin

1965	Guiguet & Pike	D	F		GA
1966	Orr	D	F		
1968	Stroud		F		
1971	Hatler	D	F		GA
"	Kasuya				
1975	Mitchell				
1978	Leatherwood & Reeves				

Lagenorhynchus obliquidens [LO] - Pacific white-sided dolphin

1950b	Scheffer	D	F		GA
1952	Cowan & Guiguet	D			GA
1953a	Scheffer		F		
1960	Pike	D			GA
1961	Houck		F		
1975	Mitchell				
1977	Hall & Tillman	A	D		GA
1978	Leatherwood & Reeves				

Lissodelphis borealis [LB] - northern right whale dolphin

1971	Kasuya				
1975	Mitchell				
1978	Leatherwood & Reeves				

Megaptera novaeangliae [MN] - humpback whale

1909	Andrews		F					GA
1920	Hanna	D				Br		
1930	Howell & Huey		F					
1931	Kellogg							
1935	Townsend	D						
1939	Scheffer		F				Al	
1940	Thompson		F				Al	
1946	Nikulin	D			Ch	Br		
1953	Sakiura et al.	D	F				Al	
1955	Omura	A	D			Br	Al	
"	Sleptsov	A	D					
"	Zenkovich		D			Br		
1956	Uda & Nasu		D				Al	
1957	Nemoto		D	F			Al	
1958	Kawakami & Ichihara							
"	Murie		D			Br	Al	GA
"	Nemoto		D	F				
1960	Fujino							
1961a	Sleptsov	A	D		Ch			
1963	Nasu		D					
"	Rice		D					
1964	Omura & Ohsumi		D			Br	Al	GA
1966	Berzin & Rovnin		D					
"	Dawbin		D					
"	Fedoseev		D			Br		
"	Nasu		D			Br	Al	GA
"	Nishiwaki	A	D			Br	Al	GA
1967	Doi et al.	A						
"	Ivashin & Rovnin		D					
"	Whales Res. Inst.		D					
1971	Ohsumi et al.	A						
"	Zenkovich	A	D					
1972	Wolman		D	F	Ch	Br		GA
1973	Scheffer	A						GA
1974	Allen	A						
"	Ohsumi & Wada	A	D					
" b	Rice	A	D					
1975	Kawamura		D			Br	Al	
"	Pitcher		D					GA
"	Tillman	A						
"	Wada	A	D			Br	Al	GA
"	Zhirnov et al.							
1976	Int. Whaling Comm.		D					GA
"	Wada	A	D			Br	Al	GA
1977	Hall & Tillman	A	D					GA
"	Int. Whaling Comm.		D					GA
"	Jurasz & Jurasz							GA
"	Mercer et al.	A	D					GA
"	Wada	A	D			Br	Al	GA
1978	Wolman							

Mesoplodon stejnegeri [MS] - sabertooth whale

1949a	Scheffer	D				Al
1953	Jellison	D			Br	
1961b	Sleptsov	D	F		Br	
1963	Moore	D				
1966	Moore	D			Br	
1969	Fiscus et al.	D				GA
1977	Hall & Tillman	D				GA
1978a	Rice					

Monodon monoceros [MON] - narwhal

1952	Huey	D		Bf		
1956	Bee & Hall	D		Bf	Ch	
1960	Geist et al.	D			Ch	Br
1961a	Sleptsov	A	D		Ch	
1969	Bruemmer	A	D		Bf	Ch
1975	Mitchell					
1978	Newman					

Orcinus orca [OO] - killer whale; orca

1872	Scammon	D	F		Ch	Br		
1920	Hanna	D				Br		
1923	Hanna	D				Br		
1926	Bailey & Hendee	D			Ch	Br		
1941	Nikulin		F		Ch	Br		
1946	Nikulin	D			Ch	Br		
1952	Jonsgard & Oynes		F					
1953	Alexander		F					
1956	Bee & Hall	D		Bf	Ch			
1959	Murie	D				Br	Al	GA
1960	Niggol et al.		F					
1961	Fiscus et al.		F					
"	Ivanova		F					
" a	Sleptsov	A	D		Ch			
" b	Sleptsov		D	F		Br	Al	
1965	Kenyon	D				Br	Al	
1967	Ivashin & Rovnin	D						
1968a	Jonsgard		F					
" b	Jonsgard		F					
"	Rice	D	F					GA
1970	Jonsgard & Lyshoel		F					
1971	Branson		F			Br		
"	Kasuya							
1972	Baldridge		F					
"	Barr & Barr		F					
1973	Scheffer	A						GA
1975	Kawamura	D				Br	Al	
"	Mitchell							
"	Pitcher	D						GA
"	Zenkovich	D					Al	
1976	Ohsumi, Masaki & Wada	D				Br	Al	GA
1977	Braham, Everitt et al.	D				Br		
"	Hall & Tillman	A	D					GA
"	Mercer et al.	A	D					GA
1978b	Scheffer							
1979	Braham, Krogman et al.	D				Br		
in press	Fay et al.		F			Br		

Phocaena phocaena [PP] - harbor porpoise

1923	Hanna	D				Br		
1926	Bailey & Hendee	D			Ch	Br		
1952	Wilke & Kenyon	D	F					
1953a	Scheffer		F					
1954	Hall & Bee	D	F	Bf	Ch			
1956	Bee & Hall	D		Bf	Ch			
1959	Murie	D				Br	Al	GA
1961a	Sleptsov	A	D		Ch			
" b	Sleptsov		D	F		Br	Al	
1968	Rice							
"	Tomilin & Morosov		F					
1973	Scheffer	A						GA
1974	Gaskin et al.	D						
1975	Mitchell					Br		
"	Ohsumi	D						
1977	Braham, Everitt et al.	D				Br		
"	Fay							
1978	Leatherwood & Reeves							

Phocoenoides dalli [PD] - Dall porpoise

1942	Benson & Groody							
1943	Ulmer		D					GA
1944	Cowan		D	F				GA
1949b	Scheffer		D			Br	Al	GA
1950	Nichols		D					GA
" a	Scheffer		D					GA
1953a	Scheffer			F				
1959	Murie		D			Br	Al	GA
1961a	Sleptsov	A	D		Ch			
1965	Mizue & Yoshida	A	D	F		Br	Al	
1966	Mizue et al.			F		Br	Al	
1968	Rice							
1972	Barr & Barr							
1972	Loeb		D	F				
1973	Scheffer	A						GA
1975	Kawamura		D			Br	Al	
"	Ohsumi		D					
"	Mitchell							
"	Pitcher		D					GA
1976	Ohsumi, Masaki & Wada		D			Br	Al	GA
1977	Braham, Everitt et al.		D			Br		
"	Hall & Tillman	A	D					GA
"	Mercer et al.	A	D					GA
1978	Leatherwood & Reeves							

Physeter macrocephalus [PM] - sperm whale

1923	Hanna		D			Br		
1931	Kellogg							
1935	Townsend		D					
1937	Robbins et al.		D	F				GA
1939	Scheffer			F			Al	
1940	Thompson			F			Al	
1955	Omura	A	D			Br	Al	
"	Sleptsov	A	D					
"	Zenkovich		D			Br	Al	
1956	Nishiwaki et al.		D				Al	
"	Uda & Nasu		D				Al	
1958	Kawakami & Ichihara		D					
1959	Berzin			F		Br	Al	
"	Murie		D			Br	Al	GA
1960	Fujino							
1962	Nishiwaki							
1963	Nasu		D					
"	Nemoto & Nasu			F		Br	Al	
"	Rice		D					
1964a	Berzin		D			Br	Al	GA
" b	Berzin							
"	Okutani & Nemoto		D	F		Br	Al	GA
"	Omura & Ohsumi		D			Br	Al	GA
1966	Berzin & Rovnin		D					
"	Caldwell et al.		D	F				
"	Nishiwaki	A	D			Br	Al	GA
"	Ohsumi		D					
1967	Doi et al.	A						
"	Ivashin & Rovnin		D					
"	Whales Res. Inst.		D					
1970	Berzin	A	D	F				
"	Shurunov		D	F			Al	GA
1971	Int. Whaling Comm., SC		D					
"	Kasuya							
"	Ohsumi et al.	A						
"	Zenkovich	A	D					
1973	Scheffer	A						GA
1974	Allen	A						
"	Gulland		D					
"	Int. Whaling Comm.		D					
"	Ohsumi & Wada	A	D					
1974	Omura & Ohsumi	A	D					
" b	Rice	A	D					
1975	Brown		D					
"	Tillman	A						
"	Wada	A	D			Br	Al	GA
1976	Wada	A	D			Br	Al	GA
1977	Ohsumi & Masaki	A	D			Br	Al	GA
"	Ohsumi, Masaki & Wada		D			Br	Al	GA
"	Tillman	A	D				Al	GA
"	Wada	A	D			Br	Al	GA
1978d	Rice							

Stenella coeruleoalba [SC] - striped dolphin

1949	Kenyon & Scheffer	D			
1952	Cowan & Guiguet	D			GA
1953a	Scheffer		F		
1960	Scheffer	D			
1970	Sampson	D		Br	
1971	Kasuya				
1973	Miyazaki et al.		F		
1975	Mitchell				
1978	Leatherwood & Reeves				

Ziphiids [Ziph] - beaked whales, general

1968	Moore				
1975	Mitchell				
1978a	Rice				

Ziphius cavirostris [ZC] - goosebeak whale; Cuvier's beaked whale

1940	Cowan & Hatter	D			GA
1945	Cowan	D			GA
1949a	Scheffer	D		Al	
1952	Cowan & Guiguet	D			GA
1953	Roest et al.	D			
1961a	Kenyon	D		Al	
"	b Sleptsov	D	F	Br	
1968	Mitchell	D			
1969	Fiscus et al.	D		Al	
1973	Balcomb	D			
1977	Braham, Everitt et al.	D		Br	
"	Hall & Tillman	D			GA
1978a	Rice				

AREA INDEX

BEAUFORT SEA

1885	Ray. P.H.	Bow,PH
1935	Townsend	Bow
1952	Huey	Mon
1954	Hall & Bee	PP
1956	Bee & Hall	MM
1960	Maher	ER
1963	Maher & Wilimovsky	Bow
1965c	Burns	ER
1966	Klinkhart	DL
"	Polar Record	UM
" a	Tikhomirov & Kosygin	PF
1967	Lentfer et al.	UM
1969	Bruemmer	Mon
1970	Lentfer	UM
1971	Frame	UM
"	Lentfer	UM
"	Rice & Wolman	ER
1972	Burns & Harbo	PH
1973	Burns & Morrow	MM
"	Addison & Brodie	DL
1974	Lentfer	UM
"	Smith	Bow,DL,PH
" b	Stirling	UM.PH,EB
1975	Bockstoce	Bow
"	Fiscus & Marquette	Bow,DL,OR,PH
"	Lentfer	UM
"	Sergeant & Brodie	DL
"	Smith	PH
"	Stirling et al.	PH,EB
1976	Geraci & Smith	PH
"	Marquette	BOW
"	U.S. Fish Wildl. Serv.	UM
1977	Bockstoce	Bow
"	Braham & Krogman	Bow,DL
"	Braham, Krogman & Fiscus	Bow,DL,MM
"	Burns & Eley	PH,EB
"	Eley	UM,PH,EB
"	Krogman	Bow
" a	Lowry et al.	MM
" b	Lowry et al.	Phoc
"	Marquette	Bow
"	Nakashim	Bow
"	Stirling & Archibald	UM.EB,PH
1978	Fraker et al.	Bow.DL
"	Lowry et al.	PH.Bow
1979	Braham. Krogman et al.	Bow
"	Durham	Bow
in press	Braham et al.	Bow
"	Everitt & Krogman	Bow
"	Marquette	Bow.DL,OR, PH,EB,UM

CHUKCHI SEA

1872	Scammon	OO
1885	Ray. P.H.	Bow.PH
1926	Bailey & Hendee	MM
1935	Townsend	Bow
1940	Rainey	Bow
1941	Nikulin	OR,OO,UM
1946	Nikulin	Cet
1947	Nikulin	OR
"	Rainey	Bow,DL.PH,EB.OR
1949	Scattergood	BA
1954	Brooks	OR
"	Hall & Bee	PP
1955	Fay	OR
1956	Bee & Hall	MM
1959	Gilmore	ER
1960	Geist et al.	Mon
"	Maher	ER
"	Nasu	ER,BP,BG
1961a	Sleptsov	Cet
"	Wilke & Fiscus	ER
"	Tikhomirov	Phoc
1962	Fedoseev	OR
"	Krylov	OR
"	Pike	ER
1963	Maher & Wilimovsky	Bow
"	Nasu	Cet
1964	Kleinenberg et al.	DL
1965b	Burns	OR
" c	Burns	ER
"	Foote	MM
"	Rice	ER
" d	Shustov	PF
1966	Berzin & Rovnin	Cet
"	Fedoseev	MM
"	Johnson et al.	MM
"	Klinkhart	DL
"	Krylov	OR
"	Polar Record	UM
"	Saario & Kessel	PH,EB OR,DL.Bow
" a	Tikhomirov & Kosygin	PH
1967a	Burns	EB
"	Lentfer et al.	UM
"	Nishiwaki	MM
1968	Gol'tsev	OR
"	Krylov	OR
1969	Bruemmer	Mon
"	Omura et al.	BG
1970	Burns	OR,Phoc
"	Lentfer	UM
"	Shurunov	ER
" a	Zimushko	ER
"	Zimushko & Lenskaya	ER
1971	Frame	UM,OR
"	Krylov	OR
"	Lentfer	UM
"	Rice & Wolman	ER
1972	Burns & Harbo	PH
"	Gol'tsev	OR
"	Wolman	MN
1973	Burns & Fay	PL
"	Burns & Morrow	MM
"	Lentfer	CU
1974	Lentfer	UM
1975b	Fay	MM
"	Fedoseev	PH
"	Fiscus & Marquette	Bow.DL,OR,PH
"	Kosygin	OR,PL
"	Kuz'min & Berzin	Bow.ER
"	Lentfer	UM
"	Ray. D.J.	MM
"	Tomilin & Kibal'chich	OR
1976	Golt'sev	OR
"	Marquette	Bow,DL,PH OR,UM
"	Naito	PL
"	U.S. Fish Wildl. Serv.	OR,UM
1977	Bockstoce	Bow
"	Braham, Fiscus & Rugh	MM
"	Braham & Krogman	Bow,DL
"	Braham, Krogman & Fiscus	Bow,DL,MM
"	Burns & Eley	PH,EB
"	Burns, Shapiro & Fay	Pinn
"	Eley	UM,PH,EB
" b	Lowry et al.	Phoc
"	Marquette	Bow
"	Nakashim	Bow
"	Ray & Wartzok	OR,UM
"	Reeves	OR
1978	Estes & Gilbert	OR
"	Krogman et al.	OR
"	Lowry et al.	PH,Bow
1979	Braham, Krogman et al.	Bow,MM,DL
"	Durham	Bow
in press	Braham et al.	Bow
"	Marquette	Bow,DL,OR, PH,EB.UM

BERING SEA

1871	Scammon	EJ
1872	Scammon	OO
1915	Osgood et al.	CU,EJ,EL
1920	Hanna	MM
1923	Hanna	MM
1926	Bailey & Hendee	MM
1928	Bailey	PF,PL
1935	Townsend	Bow,BG
1941	Nikulin	OR,UM OO
1945	Scheffer	EJ
1946	Nikulin	Cet
1947	Nikulin	OR
1949	Scattergood	BA
" b	Scheffer	PD
1952	Fay	OR
"	Wilke & Kenyon	EJ
1953	Alexander	CU
"	Fay	OR
"	Jellison	MS
1954	Brooks	OR
"	Wilke & Kenyon	CU
1955	Fay	OR
"	Omura	Cet
"	Taylor et al.	CU
1956	Gilmore	BG
1958	Ichihara	ER
"	Omura	BG
"	Wilke et al.	CU
1959	Berzin	PM
"	Gilmore	ER
"	Mathisen	EJ
"	Murie	MM
"	Nemoto	Cet
1960	Geist et al.	Mon
" a	Kenyon	MM
" b	Kenyon	OR
" c	Kenyon	PH
" d	Kenyon	OR
"	Nasu	ER
"	Niggol et al.	CU
1961	Kenyon & Rice	EJ
" b	Sleptsov	Cet
"	Tikhomirov	Phoc
"	Wilke & Fiscus	ER
1962	Fedoseev	OR
"	Gudkov	Cet
" a	Kenyon	EJ
" b	Kenyon	Phoc
"	Pike	ER
"	Thomas & Scheffer	PH
1963	Fay	ER
"	Jones	CU
"	Nasu	Cet
"	Nemoto	Cet
1964a	Berzin	PM
"	Fiscus et al.	CU
"	Kleinenberg et al.	DL
"	Okutani & Nemoto	PM
"	Omura & Ohsumi	Cet
" a	Tikhomirov	Pinn
" b	Tikhomirov	EJ
1965b	Burns	OR
"	Fiscus,Baines & Kajimura	CU
"	Fiscus & Kajimura	CU
"	Fiscus & Marquette	Bow
"	Kenyon	MM
"	Mizue & Yoshida	PD
"	Rice	ER
" a	Shustov	PF
" b	Shustov	PF
" c	Shustov	PF
" d	Shustov	PF
1966	Berzin & Rovnin	Cet
"	Chugunkov & Prokhorov	CU.EJ
"	Fedoseev	MM
"	Fiscus & Baines	EJ
"	Klinkhart	DL
" a	Kosygin	EB
" b	Kosygin	Phoc
" c	Kosygin	EB,PF
"	Krylov	OR
"	Mizue et al.	PD
"	Moore	MS
"	Nasu	Cet
"	Nishiwaki	Cet
"	Polar Record	UM
" a	Tikhomirov	Phoc
" b	Tikhomirov	Phoc
" a	Tikhomirov & Kosygin	PF
" b	Tikhomirov & Kosygin	Phoc,EJ
1967a	Burns	EB
" b	Burns	OR,Phoc
"	Chapskii	PL
"	Nishiwaki	MM
"	Shustov	PL,PF.EB
"	Vania & Klinkhart	PV,DL
1968	Gol'tsev	OR
"	Tikhomirov	Phoc
"	Vania et al.	PV.DL
1969	Klinkhart	PV,PL
"	Machida	CU
"	Omura et al.	BG
"	Shustov	PF
1970	Burns	OR,Phoc
"	Fedoseev & Nazarenko	PH
"	Mar. Mammal Biol. Lab.	CU
"	Sampson	SC
"	Shurunov	ER
" a	Zimushko	ER
"	Zimushko & Lenskaya	ER
1971	Branson	OO,EJ
"	Kosygin	EB
"	Machida	CU
"	Rice & Wolman	ER
1972	Burgess	MM
"	Burns, Ray, et al.	PL
" b	Fiscus	CU
"	Gol'tsev	OR
"	Kenyon	MM
"	Wolman	MN
1973	Burns	Phoc
"	Burns & Fay	PL,PV
"	Fedoseev	PF
1974	Fay	MM
"	Mar. Mammal Div.	CU
"	Ohsumi & Wada	Cet
1975a	Fay	MM
" b	Fay	MM
"	Fedoseev	PH
"	Gol'tsev et al.	PL
"	Kawamura	Cet
"	Kosygin	PF.PH PL,OR,EB
"	Kuz'min & Berzin	Bow,ER
" a	Mar. Mammal Div.	MM
" b	Mar. Mammal Div.	CU
"	Miller	OR
"	Ohsumi	PD.PP,GM,BB
"	Ray, G.C. & Watkins	OR
"	Ray, D.J.	MM
"	Sergeant & Brodie	DL
"	Tikhomirov	Pinn

1976	Fedoseev & Shmakova	PL,PF
"	Marquette	Bow
"	Miller	OR
"	Naito	PL,PV
"	Ohsumi, Masaki & Wada	OO,BB PD,Cet
"	Popov	Phoc
"	Schneider & Faro	EL
"	U.S. Fish Wildl. Serv.	OR,UM
"	Wada	Cet
1977	Berg	MM
"	Bockstoce	Bow
"	Braham	ER
"	Braham, Everitt et al.	MM
"	Braham, Fiscus & Rugh	MM
"	Braham & Krogman	Bow.DL
"	Braham, Krogman & Fiscus	Bow.DL
"	Burns & Eley	PH,EB
"	Burns & Harbo	PL
"	Burns, Shapiro & Fay	Pinn
"	Fay	MM
"	Fay et al.	OR
1977	Lowry et al.	Phoc
"	Mar. Mammal Div.	CU
"	Marquette	Bow
"	Ohsumi, Masaki & Wada	PM
"	Ohsumi & Masaki	PM
"	Reeves	OR
"	Scheffer	PV
"	Wada	Cet
"	Watkins & Ray	PF
1978	Mar. Mammal Div.	CU
"	Krogman et al.	OR
1979	Braham, Krogman et al.	Bow,MM,DL
in press	Braham et al.	Bow
"	Everitt & Braham	PV
"	Fay & Ray	OR
"	Fay et al.	OR,EL,ER,OO
"	Marquette	Bow
"	Lowry et al.	Phoc
"	Rugh & Braham	ER

ALEUTIAN RIDGE

1870	Scammon	EL
1935	Barabash-Nikiforov	EL,Pinn
"	Townsend	BG
1938	Barabash-Nikiforov	MM
1940	Thompson	Cet
1949	Scattergood	BA
" a	Scheffer	ZC,BB,MS(?)
" b	Scheffer	PD
1953	Sakiura et al.	Cet
1954	Wilke & Kenyon	CU
1955	Omura	Cet
"	Taylor et al.	CU
1956	Nishiwaki et al.	PM
"	Uda & Nasu	Cet
1957	Nemoto	Cet
1958	Ichihara	ER
"	Ohsumi	BP
"	Omura	BG
1959	Berzin	PM
"	Mathisen	EJ
"	Murie	MM
"	Nemoto	Cet
1960	Lensink	EL
"	Niggol et al.	CU
"	Nikolaev	EL
1961a	Kenyon	ZC
"	Kenyon & Rice	EJ
"	Nikolaev	EL
" b	Sleptsov	Cet
1962	Fiscus & Scheffer	EJ
"	Johnson & Alcorn	EL
1963	Burns & Croxton	EL
"	Mathisen & Lopp	EJ
"	Nasu	Cet
"	Nemoto	Cet
1964a	Berzin	PM
"	Fiscus et al.	CU
"	Okutani & Nemoto	PM
"	Omura & Ohsumi	Cet
1965	Kenyon	MM
"	Mizue & Yoshida	PD
1966	Berzin & Rovnin	Cet
"	Fiscus & Baines	EJ
"	Mizue et al.	PD
"	Nasu	Cet
"	Nishiwaki	Cet
1967	Nishiwaki	MM
1968	Vania et al.	EL
1969	Fiscus et al.	ZC
"	Machida	CU
"	Omura et al.	BG
1970	Machida	Sei
" a	Mar. Mammal Biol. Lab.	CU
"	Shurunov	BP,PM,Sei
"	Machida	CU
1971	Nikolaev	EL
1972	Fiscus	CU,EJ
"	Ohsumi & Wada	BM
1973	Burns & Fay	PV
1974	Ohsumi & Wada	Cet
1975	Bigg & MacAskie	CU
"	Borodin & Vladimirov	CU
"	Kawamura	Cet
" a	Mar. Mammal Biol. Lab.	MM
"	Ohsumi	PD,PP,GM,BB
"	Sherrod et al.	EL
"	Wada	Cet
1976	Ohsumi, Masaki & Wada	OO,BB,PD,Cet
"	U.S. Fish Wildl. Serv.	EL
"	Wada	Cet
1977	Braham	ER
"	Braham, Everitt et al.	EJ
"	Braham, Everitt & Rugh	EJ
"	Hall et al.	ER
"	Ohsumi & Masaki	PM
"	Ohsumi, Masaki & Wada	PM
"	Tillman	PM
"	Wada	Cet
1978b	Gilmore	ER
in press	Everitt & Braham	PV
"	Rugh & Braham	ER

GULF OF ALASKA

(1892)1953	Alexander	CU
1935	Townsend	BG
1937	Robbins et al.	PM
1940	Cowan & Hatter	ZC
1943	Ulmer	PD
1944	Cowan	PD
1945	Cowan	ZC
1945	Cowan & Carl	MA
1947	Imler & Sarber	PV,EJ
1949	Scattergood	BA
1949b	Scheffer	PD
1950	Nichols	PD
" a	Scheffer	PD
" b	Scheffer	LO
1952	Cowan & Guiguet	LO,SC,ZC
"	Kenyon	EJ,CU
"	Wilke & Kenyon	CU,EJ,PP
1953	Pike	BB
" b	Scheffer	EL
1954	Wilke & Kenyon	CU
1955	Taylor et al.	CU
1956	Gilmore	BG
"	Schiller & Rausch	CU,EJ,PV
1958	Omura	BG
"	Pike & Maxwell	EJ
"	Pike et al.	CU
"	Wilke et al.	CU
1959	Daetz	EJ
"	Mathisen	EJ
"	Murie	MM
"	Pike et al.	CU
1960	Lensink	EL
"	Niggol et al.	CU
"	Pike	LO
"	Pike et al.	CU
1961	Nikolaev	EL
"	Pike	EJ
"	Pike et al.	CU
"	Thorsteinson et al.	EJ
"	Wilke & Fiscus	ER
1962	Fiscus & Scheffer	EJ
"	Johnson & Alcorn	EL
"	Mathisen et al.	EJ
"	Pike	ER
"	Pike et al.	CU
"	Thorsteinson & Lensink	EJ
1963	Jones	CU
"	Mathisen & Lopp	EJ,PV
"	Nemoto	Cet
"	Pike et al.	CU
1964a	Berzin	PM
"	Okutani & Nemoto	PM
"	Omura & Ohsumi	Cet
"	Spalding	PV,EJ,CU
1965	Fiscus & Kajimura	CU
"	Guiguet & Pike	GG
"	Nemoto & Kasuya	Cet
"	Nikolaev	EL
"	Pike et al.	CU
1966	Berzin & Rovnin	Cet
"	Fiscus & Baines	EJ
"	Klinkhart	DL
"	Nasu	Cet
"	Nishiwaki	Cet
"	Pike & MacAskie	CU
"	Pike et al.	CU
1967	Bishop	PV
"	Fiscus & Kajimura	CU
"	Klinkhart	PV
"	Nishiwaki	MM
"	Pike & MacAskie	CU
"	Vania & Klinkhart	EJ.EL,PV
1968	Branson	OR
"	Pike & MacAskie	CU
"	Rice	OO
"	Vania et al.	PV,EJ
1969	Bigg	PV
"	Fiscus et al.	MS
"	MacAskie	CU
"	Omura et al.	BG
"	Pike & MacAskie	MM
1970	MacAskie	CU
" a	Mar. Mammal Biol. Lab.	CU
" b	Mar. Mammal Biol. Lab.	CU
"	Shurunov	BP,PM,Sei
1971	Bigg & MacAskie	CU
"	Doroshenko	BM,BP
"	Hatler	GG
" a	Mar. Mammal Biol. Lab.	CU
" b	Mar. Mammal Biol. Lab.	CU
"	Prasil	EL,EJ,PV
"	Rice & Wolman	ER
1972	Bigg & MacAskie	CU
"	Fiscus	CU
"	Mar. Mammal Biol. Lab.	CU
"	Ohsumi & Wada	BM
"	Wolman	MN
1973	Mar. Mammal Div.	CU
"	Scheffer	MM
1974	Bigg & MacAskie	CU
"	Hatler & Darling	ER
"	Ohsumi & Wada	Cet
1975	Bigg & MacAskie	CU
"	Calkins & Lent	EL
"	Calkins et al.	MM
"	Carlson	EJ
" a	Mar. Mammal Biol. Lab.	MM
"	Pitcher	EL,EJ,PV,Cet,CU
"	Sandegren	EJ
"	Sergeant & Brodie	DL
"	Wada	Cet
1976	Int. Whaling Comm.	BM,MN
"	Naito	PV
"	Ohsumi, Masaki & Wada	OO,BB,PD,Cet
"	Spotte	GM
"	U.S. Fish Wildl. Serv.	EL
"	Wada	Cet
1977	Braham	ER
" a	Calkins & Pitcher	EJ
" b	Calkins & Pitcher	DL,MA
"	Gogan	MA
"	Hall et al.	ER
"	Hall & Tillman	Cet
"	Hart	ER
"	Int. Whaling Comm.	BM.MN
"	Johnson	PV
"	Mercer et al.	MM,A,D
"	Ohsumi & Masaki	PM
"	Ohsumi, Masaki & Wada	PM
"	Pitcher	PV
"	Pitcher & Calkins	PV
"	Tillman	PM
"	Wada	Cet
1978b	Gilmore	ER

OKHOTSK SEA

1941	Arsen'ev	PF
1961	Tikhomirov	Phoc
1973	Fedoseev	PF
1975	Berzin & Kuz'min	BG,Bow,ER
"	Kuzin	CU
"	Kuz'min & Berzin	BG.Bow,ER
"	Fedoseev	PH

SUBJECT INDEX

MARKING, TAGGING

1953	Kenyon & Wilke	CU
1958	Kawakami & Ichihara	Cet
"	Pike et al.	CU
1959	Nemoto	Cet
"	Niggol et al.	CU
1960	Fujino	BP
"	Niggol et al.	CU
1961	Fiscus et al.	CU
1963	Roppel et al.	CU
1964	Omura & Ohsumi	Cet
1965	Fiscus & Kajimura	CU
"	Roppel et al.	CU
1966	Chugunkov & Prokhorov	CU
"	Roppel et al.	CU
" a	Tikhomirov & Kosygin	PF,PH
1967	Ivashin & Rovnin	Cet
"	Scheffer & Todd	CU
"	Vania & Klinkhart	PV
"	Whales Res. Inst.	Cet
1968	Vania et al.	PV
1969	Mar. Mammal Biol. Lab.	CU
1970a	Mar. Mammal Biol Lab.	CU
1970b	Mar. Mammal Biol. Lab.	CU
1971a	Mar. Mammal Biol. Lab.	CU
" b	Mar. Mammal Biol. Lab.	CU
1972	Leatherwood et al.	Cet
"	Mar. Mammal Biol. Lab.	CU
"	Ohsumi & Wada	BM
1973	Burns	PL,PF,PV
"	Kuzin et al.	CU
"	Mar. Mammal Div.	CU
1974	Brown	BG,OO,GM,Cet
"	Int. Whaling Comm.	Cet
"	Mar. Mammal Div.	CU
"	Omura & Ohsumi	Cet
1975	Brown	Cet
"	Mar. Mammal Div.	CU
1976	Mar. Mammal Div.	CU
1977a	Calkins & Pitcher	EJ
"	Estes	OR
"	Mar. Mammal Div.	CU
"	Ohsumi & Masaki	PM

PARASITES, DISEASE

1935	Barabash-Nikiforov	EL
1939	Scheffer	MN,PM
1953	Sakiura et al.	Cet
1958	Scheffer	Pinn
1959	Daetz	EJ
"	Nemoto	Cet
1960	Fay	OR
1963	Roppel et al.	CU
1965	Fiscus & Kajimura	CU
"	Rice	ER
"	Roppel et al.	CU
"	Roppel, Johnson & Chapman	CU
1966	Klinkhart	DL
"	Roppel et al.	CU
1967	Scheffer & Todd	CU
1968	Tomilin & Smyshlyayev	Cet
1969	Machida	CU
"	Mar. Mammal Biol. Lab.	CU
1970	Baker et al.	CU
"	Berzin	PM
" a	Mar. Mammal Biol. Lab.	CU
" b	Mar. Mammal Biol. Lab.	CU
1971	Machida	CU
" b	Mar. Mammal Biol. Lab.	CU
"	Rice & Wolman	ER
"	Zenkovich	Cet
1972	Mar. Mammal Biol. Lab.	CU
1974	Rice	Sei
1975	Gol'tsev et al.	PL
"	Mar. Mammal Div.	CU
1976	Mar. Mammal Div.	CU
1977	Burns & Eley	PH
"	Gogan	MA
"	Mar. Mammal Div.	CU
"	Nat. Mar. Fish. Serv.	MM
1978	Mar. Mammal Div.	CU

POLLUTANTS

1967	Pike & MacAskie	CU
1968	Pike & MacAskie	CU
1969	MacAskie	CU
1970	MacAskie	CU
1971	Bigg & MacAskie	CU
" a	Mar. Mammal Biol. Lab.	CU,EJ
1973	Addison & Brodie	DL
"	Burns & Morrow	PP.PL,DL
1974	Anas	CU,PV
1975	Øritsland	PH
"	Smith & Geraci	PH
1976	Geraci & Smith	PH
"	Kooyman.Gentry&McAlister	CU,EL,EB
1977	Engelhardt et al.	PH
" b	Lowry et al.	Phoc
"	Mar. Mammal Div.	CU
1978	Fraker et al.	Bow,DL
"	Krogman et al.	OR
"	Lowry et al.	PH,Bow

POPULATION DYNAMICS (including mortality, birth rates, etc.)

1955	Fay	OR
"	Sleptsov	Cet
1959	Scott et al.	OR
1960	Lensink	EL
1962	Thorsteinson & Lensink	EJ
1963	Roppel et al.	CU
1965	N. Pac. Fur Seal Comm.	CU
"	Roppel & Davey	CU
"	Roppel.Johnson & Chapman	CU
"	Roppel.Johnson et al.	CU
1966	Burns	OR
"	Klinkhart	DL
"	Roppel et al.	CU
1967a	Burns	EB
" b	Burns	OR
"	Bishop	PV
"	Doi et al.	Cet
"	Scheffer & Todd	CU
1968	Krylov	OR
"	Tomilin & Smyshlyayev	Cet
1969	Arsen'ev	CU
"	Bigg	PV
"	N. Pac. Fur Seal Comm.	CU
" a	Zimushko	ER
" b	Zimushko	ER
1970	Baker et al.	CU
"	Mansfield	PH
" b	Mar. Mammal Biol. Lab.	CU
1971	Harry	CU
"	Int. Comm. Whaling	PM
" b	Mar. Mammal Biol. Lab.	CU
"	N. Pac. Fur Seal Comm.	CU
"	Ohsumi et al.	Cet
"	Omura & Ohsumi	BM,BP,Sei,PM
1972	Arsen'ev	CU
"	Ohsumi & Wada	BM
1973b	Smith	PH
1974	Allen	Cet
"	Ohsumi & Wada	Sei,BP
1975b	Fay	MM
"	Fedoseev	PH
"	Johnson, A.M.	CU
"	Lander	CU
"	Mar. Mammal Div.	CU
"	N. Pac. Fur Seal Comm.	CU
"	Ohsumi & Fukuda	Sei
"	Wada	Cet
1976	Fedoseev	Phoc,OR
"	Lander & Kajimura	CU
"	Mar. Mammal Div.	CU
1977a	Calkins & Pitcher	EJ
"	Fay	MM
"	Gogan	MA
"	Mar. Mammal Div.	CU
"	Pitcher	PV
1978	Mar. Mammal Div.	CU
in press	Chapman	MM
"	Fay & Ray	OR
"	Fay, Shults & Dieterich	MM
"	York	CU

REPRODUCTION

1935	Barabash-Nikiforov	EL
1941	Nikulin	OR
1945	Scheffer	EJ
1949	Scattergood	BA
1952	Bartholomew	MA
1953	Sakiura	Cet
1954	Brooks	OR
1955	Fay	OR
"	Omura	Cet
"	Sleptsov	Cet
1956	Nishiwaki et al.	PM
1958	Ohsumi et al	BP
"	Pike & Maxwell	EJ
"	Pike et al.	CU
"	Scheffer	Pinn
"	Wilke et al.	CU
1959	Mathisen	EJ
"	Niggol et al.	CU
1960	Niggol et al.	CU
"	Pike et al.	CU
1961	Fiscus et al.	CU
"	Nikolaev	EL
"	Tikhomirov	Phoc
1962b	Kenyon	PH,EB
"	Klumov	BG
"	Krylov	OR
"	Mathisen et al.	EJ
"	Thorsteinson & Lensink	EJ
1963	Fay	ER
"	Pike et al.	CU
1964	Fiscus et al.	CU
"	Sund	ER
" a	Tikhomirov	Pinn
1965b	Burns	OR
" c	Burns	OR,EB
1965	Fiscus et al.	CU
"	Mizue & Yoshida	PD
"	Rice	ER
"	Roppel & Davey	CU
"	Roppel,Johnson & Chapman	CU
"	Roppel et al.	CU
" a	Shustov	PF
" b	Shustov	PF
" d	Shustov	PF
1966	Burns	OR
"	Johnson, M.L. et al.	PH,EB
" b	Kosygin	Phoc
"	Mizue et al.	PD
"	Pike et al.	CU
"	Roppel et al.	CU
" a	Tikhomirov	Phoc
1966b	Tikhomirov & Kosygin	Phoc
1967	Bishop	PV
" a	Burns	EB
"	Doroshenko et al.	BA
"	Fiscus & Kajimura	CU
"	Klinkhart	PV
"	Scheffer & Todd	CU
"	Vania & Klinkhart	EJ
1968	Krylov	OR
"	Tikhomirov	Phoc
1969	Bigg	PV
"	Mar. Mammal Biol. Lab.	CU
"	Omura et al.	BG
" a	Zimushko	ER
" b	Zimushko	ER
1970	Baker et al.	CU
"	Berzin	PM
"	Burns	OR,Phoc
"	Jonsgard & Lyshoel	OO
" a	Mar. Mammal Biol. Lab.	CU
" b	Mar. Mammal Biol. Lab.	CU
" c	Zimushko	ER
1971	Int. Comm. Whaling, SC	PM
"	Doroshenko	BM,BP
" a	Mar. Mammal Biol. Lab.	CU
" b	Mar. Mammal Biol. Lab.	CU
"	Panina	CU
"	Rice & Wolman	ER
"	Zimushko	ER
1972b	Fiscus	CU
"	Loeb	PD
1973	Arsen'ev et al.	ER
"	Burns & Fay	PV,PL
"	Fedoseev	PF
" b	Smith	PH
1974	Mar. Mammal Div.	CU
"	Omura & Ohsumi	BP,BM.PM.Sei
1975	Calkins & Lent	EL
"	Fedoseev	PH
"	Kuz'min & Berzin	Bow
"	Mar. Mammal Div.	CU
"	Rice	ER
"	Smith & Stirling	ER
"	Tomilin & Kibal'chich	OR
1976	Fedoseev	Phoc,OR
"	Masaki	Sei
"	Popov	Phoc
1977	Beier & Wartzok	PL
"	Burns & Eley	PH
"	Calkins & Pitcher	EJ
"	Gogan	MA
"	Hart	ER
"	Krogman	Bow
"	Marquette	Bow
"	Natl. Mar. Fish. Serv.	MM
"	Pitcher	PV
"	Pitcher & Calkins	PV
"	Rice	Sei
"	Scheffer	PV
1978	Fraker et al.	Bow,DL
"	Krogman et al.	OR
in press	Everitt & Krogman	Bow ER
"	Fay & Ray	OR
"	York	CU

SURVEY/CENSUS METHODOLOGY

1959	Gilmore	ER
"	Mathisen	EJ
"	Scott et al.	OR,UM
1960a	Kenyon	MM
" b	Kenyon	OR
1961	Kenyon & Rice	EJ
1962	Fedoseev	OR
1963	Mathisen & Lopp	EJ,PV
1965	Kenyon	EL,MM
1966	Fedoseev	MN
" b	Tikhomirov	Phoc
1967	Vania & Klinkhart	PV
1968	Gol'tsev	OR
"	Krylov	OR
"	Vania et al.	PV
"	Ramsey	ER
1969	Rice & Wolman	ER
"	Shustov	PF
"	Uspensky & Shilnikov	UM
1970a	Zimushko	ER
1971	Rice & Wolman	ER
1972	Burns & Harbo	PH
"	Gol'tsev	OR
"	Kenyon	MM OR
"	Shustov	Phoc,OR
1973a	Smith	PH
" b	Smith	PH
1974a	Rice	ER
"	Sund & O'Connor	ER
1975	Potelov	EB PH
"	Wada	Cet
1976	Gol'tsev	OR
"	Wada	Cet
1977	Braham	ER
"	Braham, Everitt et al.	MM
"	Braham, Everitt & Rugh	EJ
"	Braham, Fiscus & Rugh	MM
"	Braham & Krogman	Bow.DL
"	Braham,Krogman & Fiscus	Bow,DL,MM
"	Burns & Eley	PH,EB
"	Burns & Harbo	PL
"	Burns, Shapiro & Fay	Pinn
"	Estes	OR
"	Jeffries et al.	PV
"	Jurasz & Jurasz	MN
"	Pitcher & Calkins	PV
"	Wada	Cet
1978	Estes & Gilbert	OR
"	Fraker et al.	Bow,DL
"	Krogman et al.	OR
1979	Braham, Krogman et al.	Bow,OO
in press	Braham, Krogman et al.	Bow
"	Everitt & Braham	PV
"	Rugh & Braham	ER

BIBLIOGRAPHIC SOURCES

Fodor, Beth.
1971. The sperm whale (Physeter catodon) - A bibliography. U.S. Dep. Inter., Off. Libr. Serv., Washington, D.C., Bibliogr. Ser. No. 25, 104 p. (Avail. Natl. Tech. Inf. Serv., Springfield, Va., as PB 200 212.)

Magnolia, L.R.
1975. Whales, whaling, and whale research: a selected bibliography; supplement number three. Special literature Survey No. 52-3, 1 July 1975. TRW Systems Group, One Space Park, Redondo Beach, CA 90278, 139 p.

National Marine Fisheries Service / National Oceanic and Atmospheric Administration.
1975. Status of marine mammal species and population stocks; report of the Secretary of Commerce. Fed. Regist., July 22, 40(141):30678-30724.

1976. Administration of the Marine Mammal Protection Act of 1972 - April 1, 1975 through March 31, 1976; report to the Congress. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Washington, D.C., June 1976. iv + 203 p. + app.

National Marine Mammal Laboratory, Northwest and Alaska Fish. Cent., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE, Seattle, WA 98115. [Collection of volumes, reprints and unpublished literature.]

Oceanic and Atmospheric Scientific Information System - OASIS. Tech. Inf. Div., Environ. Data Serv., Natl. Oceanic Atmos. Admin., Washington, D.C. [Computerized information retrieval service.]

Ronald, K., L.M. Hanly, P.J. Healey, and L.J. Selley.
1976. An annotated bibliography on the Pinnipedia. International Council for the Exploration of the Sea, Charlottenlund, Denmark DK 29 20. 785 p.

Scheffer, V.B.
1967. Alaskan seals and sea otters: a partial bibliography. Unpubl. manuscr., 7 p. U.S. Dep. Commer. Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Northwest and Alaska Fish. Cent., Mar. Mammal Div., Seattle, WA.

Skaptason, Patricia Ann.
1971. The fin whale (Balaenoptera physalus L.) - A bibliography. U.S. Dep. Inter., Off. Libr. Serv., Washington, D.C., Bibliogr. Ser. No. 26, 214 p. (Avail. Natl. Tech. Inf. Serv., Springfield, Va., as PB 200 293.)

Todd, Ethel I.
1976. Recent literature on the northern fur seal. U.S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Mar. Mammal Div., Seattle, Wash., Processed Rep., 23 p.

Todd, Ethel I., and Karl W. Kenyon.
1972. Selected bibliography on the sea otter. U.S. Dep. Inter., Fish. Wildl. Serv., Bur. Sport Fish. Wildl., Spec. Sci. Rep. Wildl. 149, 40 p.

Truitt, Deborah.
1974. Dolphins and porpoises: a comprehensive, annotated bibliography of the smaller cetacea. Gale Research Company. Detroit, Michigan, 582 p.

Wickersham, James.
1927. A bibliography of Alaskan literature 1724-1924. Misc. Publ. Alaska Agricultural College and School of Mines, Fairbanks, Alaska. Cordova Daily Times Print.. Cordova, Alaska, 635 p.