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Northwest and Alaska Fisheries Center Processed Report*

AN ANNOTATED BIBLIOGRAPHY
ON MARINE MAMMALS OF ALASKA

by

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* This report does not constitute a publication and is for information only. All data herein are to be considered provisional.

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Introduction

The following annotated bibliography was developed as an aid to assessing baseline characteristics of marine mammals in Alaska as part of the Outer Continental Shelf Environmental Assessment Program (**OCSEAP**) funded by the Bureau of Land Management, U. S. Department of the Interior.

Information from published and unpublished materials was used, in part, to complete studies on seasonal distribution and relative abundance of cetaceans (whales and dolphins) and **pin-**nipeds (seals and sea lions) in the Bering Sea (Research Unit 67), Gulf of Alaska (Research Unit 68) and **Chukchi** and Beaufort Seas (Research Unit 69/70). These ongoing research projects are administered through NOAA's Environmental Research Laboratory, Boulder and Juneau.

The objectives of the bibliography were to (1) provide a comprehensive review of the literature on marine mammals of Alaska for use in reports summarizing our knowledge with respect to specific species and areas; and (2) act as a resource base, to be used as a guide to researchers, managers and administrators who desire detail in a bibliographic source.

The geographic areas of coverage coincided approximately with our three research units: 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 Island (169°30' W. Longitude, 53°40' N. Latitude) , and from 52° N. Latitude to the Alaska coast; and RU 69/70 - the Chukchi and Beaufort Seas (collectively termed the Arctic Ocean) from 66° N. Latitude on the south and 169° W. Longitude on the west (the US - USSR 1867 Convention line), east to the American - Canadian border at 141° W. Longitude.

It was not possible within the one year contract period to collect, read and annotate all materials written about marine mammals of Alaska. Thus , the bibliography covers what we feel are the major citations that were available to us, and pertinent to understanding distribution and abundance of marine mammals **in** or near our three research areas. We did not include articles covering areas outside of Alaska except where they were spatially or temporally relevant (e.g., some articles concerning the eastern North Pacific) . If we have overlooked an important reference, we would appreciate being notified of our oversight. Unpublished materials are included because they were found to contain **im-**portant quantitative data or were used in qualitative descriptions of species, areas or pertinent subjects.

Sea otters and walruses are not covered in detail in this bibliography, and few polar bear citations were included. As time permits, through the remainder of OCSEAP funding, we will attempt to annotate additional sea otter, walrus and polar bear articles as well as locate more difficult to obtain citations on cetaceans and pinnipeds not now included. **An updated annotated bibliography will be published at the completion of OCSEAP support.**

The citation style follows the National Marine Fisheries Service Style Manual (U. S. Department of Commerce, NOAA, NMFS, Seattle, Washington: November 1972). Government and special documentation citations were verified by Mr. Roger Pearson, NMFS, Northwest and Alaska Fisheries Center. References are arranged alphabetically by author and by year. Multiple authors are listed by senior author surname, then junior author surname. When more than one citation is listed by the same author or authors, they are arranged chronologically. The name of the journal is used as author instead of "anonymous" when no author is shown. Journals and periodicals are abbreviated using the rules of the Word-Abbreviation List, American National Standards Institute, Standards Committee z39, published by the National Clearinghouse for Periodical Title Word Abbreviations.

Japanese and Soviet journal and periodical sources have been listed in romanized or transliterated form unless the original was printed with an English title. Soviet transliterations

follow **those** of the National Federation of Science Abstracting and Indexing Services, and were verified by Mr. Paul Macy, **NMFS**, **NWAFSC**. Translations of foreign literature were obtained when available, and translation information is included with the citations.

The index is in three parts: by geographic **area**, **species** and subject. Each species covered in the bibliography is listed by the presently accepted common and scientific name (in parentheses) according to "A list of the marine **mammals of the world**", by Dale W. Rice, in press.

A list of bibliographic sources reviewed during the preparation of the annotated bibliography is included after the indices. Many references from these sources were annotated and included in our bibliography.

We wish especially to thank Teresa Bray, Marine Mammal "Division, for her assistance in preparing the bibliography. Ethel Todd, MMD, and Ethel **Zweifel**, **NWAFSC**, also assisted. The authors and principal investigators are solely responsible for the inclusions, omissions and comments made in the bibliography.

SPECIES LIST

Order: Carnivora

MustelidaeEnhydra lutris (sea otter)**Odobenidae**Odobenus rosmarus divergens (walrus)**Otariidae**Callorhinus ursinus (northern fur seal)Eumetopias jubatus (northern sea lion)**Phocidae**Erignathus barbatus (bearded seal)Mirounga angustirostris (northern elephant seal.)Phoca fasciata (ribbon seal)Phoca hispida (ringed seal)Phoca largha (largha seal)Phoca vitulina richardsi (harbor seal)Order: **Mysticeti****Balaenidae**Balaena glacialis (right whale)Balaena mysticetus (bowhead whale)**Balaenopteridae**Balaenoptera acutorostrata (minke whale)Balaenoptera borealis (sei whale)Balaenoptera musculus (blue whale)Balaenoptera physalus (fin whale)Megaptera novaeangliae (humpback whale)**Eschrichtiidae**Eschrichtius robustus (gray whale)Order: **Odontoceti****Delphinidae**Globicephala macrorhynchus (shortfin pilot whale)Grampus griseus (gray grampus or whitehead)Lagenorhynchus obliquidens (Pacific whiteside dolphin)Lissodelphis borealis (northern right-whale dolphin)Orcinus orca (killer whale)Phocoena phocoena (harbor porpoise)Phocoenoides dallii (Dan porpoise)Pseudorca crassidens (false killer whale)Stenella coeruleoalba (striped dolphin)

Order: Odontoceti

Monodontidae

Delphinapterus leucas (beluga or white whale)

Monodon monoceros (narwhal)

Physeteridae

Physeter macrocephalus (sperm whale)

Ziphiidae

Berardius bairdii (North Pacific giant bottlenose whale)

Mesoplodon stejnegeri (sabertooth whale)

Ziphius cavirostris (goosebeak whale)

Order: Sirenia

Hydrodamalis gigas (great northern sea cow)

An Annotated Bibliography
on Marine Mammals of Alaska

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.

Allen, K. Radway.

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

Projected effects on 6 whale species are offered if a complete and protracted moratorium on killing is instated. 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.

Andrews, R. C.

1909. Observations on the habits of the **finback** and humpback whales of the eastern North Pacific. Bull. Am. Mus. **Natur.** Hist. **26:213-226.**

Information was collected during the spring and summer of 1908 from vessels and from whaling stations. Includes description of respiration, inspiration, diving movements, duration of dives, feeding habits and stomach contents. Animals studied were taken from waters off the west side of Vancouver Island and off the southern end of Admiralty Island, Alaska. 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 were found to the south of Guadalupe. 8 photos.

Arsen'ev, V. A.

1369. **Mezhdunarodnye koordinirovannye issledovaniya po morskim kotikan** (International coordinated research on fur seals). In V. A. Arsen'ev, B. A. Zenkovich and K. K. Chapskii (eds.), **Morskie Mlekopitayushchie**, p. 24-33; **Sbornik materialov Tret'ego Vses. soveshch. po morsk. mlekopitayushchim. Izd. "Pishch. Prom."**, 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. 39:138-150.** In Russian. (Transl. Fish. Mar. Serv., Can., 1974, in K. K. Chapskii and E. S. Mil'chenko (eds.), **Research on Marine Mammals, Transl. Ser. 3185, p. 226-239.**)

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 the 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). **Tr. Vses. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. 80,** and **Izv. Tikhookean. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. 82:25-43.** In Russian. (Transl. 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 kills. 13 maps with tables.

1972. (On maximum sustainable yield of fur seals on the Commander Islands,) **Tr. Vses. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr.** (Transl. avail. U. S. Dep. Int., **Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Mar. Mamm. Div., Seattle, Washington, 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) . In **Morskije Mlekopitayushchie**, p" 30-35. **Izd. "Pishch. Prom."**, **Moscow**. In Russian. (Transl. by Israel Program Sci. Transl. , avail. **Natl. Tech. Inf. Serv.**, Springfield, Virginia, as TT 74-50059.)

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

Bailey, Alfred M., and Russell W. Hendee.

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

Recounts an expedition of 15 months in 1921-22, visiting King and St. Lawrence Islands, Wainwright, Point Hope, Demarcation Point, and points on the Siberian coast. Includes observations on: polar bear, **largha** seal, bearded seal, ringed seal, walrus, bowhead whale, gray whale, killer whale and harbor porpoise.

Baker, Ralph C., Ford Wilke, and C. Howard Baltzo.

1970. The northern fur seal. U. S. Dep. **Int.**, U. S. Fish and **Wildl. Serv.**, Bur. **Comm. Fish. Circ. 336. Washington, D. C.**, 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 the fur seal skins." 1 drawing, 13 photos.

Balcomb, K. C.

1973. **Cuvier's** beaked whale from Washington State. **Murrelet 54(3):37.**

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

Baldrige, 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 that the killer whales held the gray whale 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 1930-1932. Describes external characteristics, especially hair color; pelage replacement; habitat and general habits; food and feeding habits; breeding habits; competitors, enemies and parasites. Eumetopias, Callorhinus and Phoca ochotensis macrodens are found at Copper Island as well, and presumably compete for food to some extent. Contains table of age versus size and weight, from embryo to over eight years.

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: sea otter, 7 pinnipeds, 5 great whales, 3 beaked whales, killer whale and 3 dolphins. Notes seasonality of most species.

Barr, Lou.

1975. **Steller** sea lion. Oceans **8(4):18-21.**

Author notes large size; healthy 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 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 Dan porpoise. Can. Field-Natur. **86(2):170-171**

Describes 2 killer whales pushing a Dall's porpoise in October 1971 near Auke Bay, Alaska. Shortly after, 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 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.

Bee, James W., and E. Raymond Hall.

1956. Mammals of northern Alaska on the arctic slope. Univ. **Kans. Mus. Natur. Hist.**, Misc. Pub. 8, 309 p.

Forty-two species are described and discussed, 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 plates, 127 fig., 5 tables.

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.** 47: 161-165. In Russian. (**Transl.** by School Fish., Univ. Washington, Seattle, 1970, 9 p.)

Stomachs of 110 whales taken in 1957 were examined. Whales were taken from (1) Aleutian ridge waters from the Commander Islands eastward to Long. **170°E**; (2) the Aleutian ridge from **Long. 170°E** to Long. **180°E**; and (3) the northern region of **Olutorsky** Bay and the Koriaksky coastline as far as the traverse of the Bay **Glubokaya**. About 64% of stomachs contained squid only. Stomach contents and degree of stomach filling were analyzed by area. In the northern area, 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 tables.

Berzin, A. A.

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. 52:267-270.** In Russian. (Transl. by Israel Program Sci. Transl., 1968, p. 263-266, in P. A. Moiseev (cd.), Soviet fisheries investigations in the northeast Pacific. Pt. 3, avail. Natl. Tech. Inf. Serv., Springfield, Virginia, as TT 67-51205.)

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

1964b. Rest kashalotov severnoi chasti Tikhogo okeana.

(Growth of sperm whales in the North Pacific). **Izd. "Pishch. Prom."**, Moscow. In Russian. (Transl. by Israel Program Sci. Transl., 1968, in P. A. Moiseev (cd.), Soviet fisheries investigations in the northeast Pacific, p. 267-271. Avail. , U. S. Dep. Commer. , Natl. Tech. Inf. Serv., Springfield, Virginia, as TT 67-51205.)

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

1970. **Kashalot** (The sperm whale). **Izd. "Pishch. Prom."**, Moscow. In Russian. (Transl. by Israel Program Sci. Transl., 1972, 367 p., avail. U. S. Dep. Commer., Natl. Tech. Inf. Serv., Springfield, Virginia, as TT 71-50160.)

A compilation of knowledge about the sperm whale. Included are 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) . In **Morskije mlekopitauishchie, chast'1** p. 30-32. **Izd. "Naukova dumka"**, Kiev. In Russian. (Transl. by U. S. Dep. Commer. , Office Foreign Fish., Language Serv. Div., Washington, D. C. 2 p.)

Gray whales: The 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 separate subspecies because of complete and 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 moyakh** (Distribution and migration of whales in the northeastern part of the Pacific Ocean, Bering and **Chuckchee Seas**). **Izv. Tikhookean. Nauchno-issled. Inst. Morsk. Rybn. Khoz. Okeanogr. 58:179-207.** In Russian. (Transl. by Dep. Int., Bur. Commer. Fish., Seattle, Washington, 1966, in K. I. Panin (cd.), Soviet Research on Marine Mammals of the Far East, p. 103-136.)

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: (1) salinity of water, (2) **cyclonic** current systems, and (3) 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. **Transl. Ser. 548, 1965, 4 p.**)

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

Bigg, M. A.

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

Between June 1971 and February 1972, four aerial and two land censuses were made. All of 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.**, Fish. Res. Board Can., **Biol. Sta.**, **Nanaimo**, British Columbia, 24 p.

(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 tables, 6 fig.

1972. Report on Canadian pelagic fur seal research in 1971-72. **Unpubl. manuscr.**, Fish. Res. Board Can., **Biol. Sta.**, **Nanaimo**, British Columbia, 21 p.

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

1974. Report on Canadian pelagic fur seal research in 1972-3. **Manuscr. Rep. Ser. 1292**, Fish. Res. Board Can., **Pac. Biol. Sta.**, **Nanaimo**, British Columbia, 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 tables, 4 fig.

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

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

Bishop, R. H.

1967. Reproduction, age determination, and behavior of the harbor seal, Phoca vitulina L., in the Gulf of Alaska. MSC. 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 4,000-5,000" 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.

Borodin, R. G., and V. A. Vladimirov.

1975. (Evaluation of the present conditions of the Komandorskiye Islands fur seal population.) **Promysl. Ikhtiolog.** (7), Ref. Inf., Ser. 1, Min. Ryb. **Khodz.** SSSR: 7-8. (Transl. by U. S. Dep. Commer., Natl. Oceanic Atmos. Admin., Serv. Div., 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.

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. **Int.**, Fish. **Wildl.** Serv., **Bur.** **Commer.** Fish., Kodiak, Alaska.

Records a sighting on 8 or 9 September 1967 on the north-west 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 whose position was 54°18'N, 167°51'W. Within an hour, one sea lion strayed from the band and was taken. The outcome of the drama is unknown.

Brooks, J. W.

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

One of the first comprehensive treatises on the walrus. Details on classification, distribution, breeding biology, **harvesting and** management given. Data included 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. Estimates 1953 population to be 15,000 in the eastern Bering Sea.

1957. Marine mammals **in** relation to commercial fisheries in Alaska. Paper presented at the Eighth Alaskan Science **Conf.**, Sept. 10-13, Anchorage, Alaska. 6 p.

Of the 7 pinnipeds and more than 12 cetaceans common to Alaska, only the fur seal and the walrus are of major present commercial value; however, Eskimos utilize ringed seal, bearded seal, harbor seal, and ribbon seal; **beluga**, bowhead and gray whale on a smaller scale. **Beluga** whales, harbor seals, and northern sea lions are discussed as predators on commercial fish. **Beluga** whale research in estuaries of Bristol Bay was begun in 1954. Harbor seal control program by Alaska Dept. of Fish and Game is discussed.

Brown, S. G.

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's**, 29 humpback, 1 bottlenose, 1 killer, 23 minke, 15 gray, 4 right and 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 Soviets marked 15 gray whales.

Bruemmer, F.

1969. The sea unicorn (Narwhal) . Audubon **71(6):58-63.**

Provides a historical account of the narwhal. Distribution is given as the Canadian arctic, although they are known to venture into the **Chukchi**. 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. **(Abstract.) Proc. 23rd Alaska Sci. Conf., 15-17 August 1972, Fairbanks, Alaska, Alaska Div., Am. Assoc. Advancement Science, p. 49.**

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, Phoca hispida, 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 north in April and May.

Burns, John J.

1965a. Marine mammal investigation in northwestern Alaska. Paper presented at the 45th Annu. Conf. Western Assoc. State Game Fish **Comm.**, July 1965, Anchorage, Alaska, 10 p.

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

1965b. The walrus in Alaska. Project rep., Fed. Aid Wildl. Restoration, Vol. V, Alaska Dep. Fish Game, 48 p.

History of walrus exploitation, economic role in Alaska, and recent and current research are discussed. Research reported on includes collection and examination of tusks, lower canine teeth, and reproductive tracts of females to determine reproductive behavior related to age; magnitude of Alaskan harvest; collection of observations to determine migration and distribution patterns. Walrus first breed at about age 6. Most mature females bear one calf every 2 years. Minimum population is estimated at 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 Penuk Islands; behavior. Extensive bibliography.

1965c. Marine mammal report. Project rep., Fed. Aid Wildl. Restoration Vol. VI, Alaska Dep. Fish Game, 45 p.

Covers calendar year 1964. Major spring migration of walrus 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 harvest was between 2,061 and 2,215.

Bearded seal specimens have been collected since 1962. For 85 reproductively active seals, the average zoological length (curvilinear) was 91 in. Weights are recorded up to 610 pounds. Delayed implantation lasts 2-1/2 to 3-1/2 months; total gestation period being 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 ice pack, 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. Project rep., Fed. Aid Wildl. Restoration Vol. VII, Alaska Dep. Fish Game, 47 p.

Covers studies conducted in 1965. Teeth were examined from known age walrus and the tooth interpretation method previously used was found valid. Reproductive tracts of 160 mature females from nursery herds were examined. Females first breed at age 5-6, and calve from then on, averaging once every 2.2 years. Adult female Pacific walrus reach a weight of about 2,100 pounds. The main migration moved into Bering Strait from 20 May-18 June. Information offered on seal and walrus harvest. Total walrus kill was between 3,213 and 3,322 animals. Seals taken included 13,590 ringed, 3,430 bearded, and 3,995 harbor seals.

1967a. The Pacific bearded seal. Project rep., Fed. Aid Wildl. Restoration Vol. VIII, Alaska Dep. Fish Game, 66 p.

A thorough, general article. Reviews knowledge of biology and current status of bearded seals. Incorporates original data compiled from 1962-1966 on 671 seals harvested by Alaskan natives. Data relates to growth, reproduction and feeding. Claws are used for age determination because of 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. Project rep., Fed. Aid Wildl. Restoration Vol. VIII, Alaska Dep. Fish Game, 44 p.

Reports on research projects undertaken during 1966. Analysis of the age composition of 353 male walrus taken at Savoonga indicated a maximum annual mortality rate of about 12% for year classes 14-28; 14% for year classes 14-33. The population is apparently continuing to increase. Walrus observations are reported from Nushagak Bay, Round Island in Bristol Bay, Big Diomedé Island and the Penuk Islands. 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 Lat. 70° in late February). Concentrations of animals were moving through the Bering Strait from 28 May to 4 July. Information offered on walrus harvest. The natural history and ecology of five species of pinnipeds (ringed, ribbon, bearded and harbor seals, and walrus) in the northern Bering Sea are discussed. Distribution of these species in April-early May (the pupping season) is mapped.

1970. Remarks on the distribution and natural history of **pagophilic** pinnipeds in the Bering and Chukchi Seas. J. Mamma 1. 51(3) :445-454.

Author's abstract: "Five species of **pagophilic** (ice-loving) pinnipeds live in the Bering and Chukchi Seas: Odobenus rosmarus, Phoca (Puss) hispida, Phoca (Histriophoca) fasciata, an ice-breeding population of Phoca (Phoca) vitulina, and Erignathus barbatus. Breeding adults of these 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." 1 map.

1973. Marine mammal report. Project rep., Fed. Aid Wildl. Restoration Vol. XIII. Alaska Dep. Fish Game. 29 p.

Reports on research jobs for 1971-1972. Tagging of 76 harbor and 3 ribbon seals recorded. Their location, weight, length, sex, etc., are tabulated. On one cruise, 21 specimens of Phoca vitulina richardii were taken. Fish and invertebrates were also 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 report 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 tables.

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

1963. Marine mammal investigations. Project rep., Fed. Aid Wildl. Restoration, Vol. 111, Alaska Dep. Fish Game, 38 p.

In their northward migration in 1962, walrus passed Gambell May 8-24, Savoonga May 3-23, Bering Strait June 1-7. Collected items included 694 pairs of lower canine teeth, 163 female reproductive tracts, and 200 sets of eyes. Information on walrus harvest and utilization provided. Between 16 January 1962, and 25 February 1962, 150 sea otters were shot at Amchitka Island. More research is suggested, in order to determine the optimum harvest season and harvest size.

Burns, J. J., and F. H. Fay.

1973. Comparative biology of Bering Sea harbor seal populations. (Abstract.) Proc. 23rd Alaska Sci. Conf., August 1972, Fairbanks, Alaska, p. 48.

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 to Barter Islands. 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/mi²). Within sectors southwest of this point, density was substantially higher (5.36 and 3.70 seals/mi²). 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 tables.

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.

Author discusses 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** seal, walrus, bearded seal, **beluga** and **bowhead** whales, gray whale, harbor porpoise. Regular visitors are humpback, finback, sei, little piked and killer whales. Occasional visitors are listed as northern fur seal, Stellar 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 grows 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.

Caldwell, D. K., M. C. **Caldwell**, and D. W. Rice.

1966. Behavior of the sperm whale (*Physeter catodon* L.) In K. E. Norris (ed.), Whales, dolphins, and **porpoises**, p. 677-717. University of 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°C 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 rock cod and sharks occasionally taken.

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 a small lagoon on the 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., Kenneth Pitcher, and Karl Schneider.

1975. Distribution and abundance of marine mammals in the Gulf of Alaska. Processed Rep., Alaska Dep. Fish Game, Div. Game, Anchorage, 39 p.

Report prepared under an OCSEAP contract to NOAA. Sea otters, northern sea lions, and harbor seals are discussed at length, as were the 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, Dan porpoise, sperm whale, Bering Sea beaked whale, goose-beaked whale, northern right whale dolphin, short-finned pilot whale, **belukha**, and giant bottle-nosed whale. Charts show sea lion and sea otter distribution ; others show harbor seal density. 4 tables, 31 charts.

Carlson, H. 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 efforts have changed from restoring depleted herds to developing exploitation strategy for abundant herds. Whale stocks have not been managed as effectively. 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.

Chapskii, K. K.

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

During April to July 1964, 80 specimens and 60 additional skulls of the **largy** 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.* 58:233-234. In Russian. (Transl. by Dep. Int., Bur. Commer. Fish., Seattle, Washington, 1966, in K. I. Panin (cd.), Soviet research on marine mammals of the Far East, p. 137-139.)

Fur seals, single animals or groups of up to 10, have been encountered regularly during winter herring trawling in **Olyutorsk** Bay. Among them, 3 animals with American tags were caught: 2 males and 1 female. Sea lions occur in greater numbers. Both species follow vessels, feeding on herring and Alaska **pollock** from nets. Figures show fur seal encounters 1959-64, by month.

Clarke, Robert.

1957. Migration of marine mammals. *Norsk Hva'lfangst-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.

1944. The Dan 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, British Columbia. They were examined in detail to ascertain variation in external and skeletal features. Four of the stomachs were full and contained only herring. Measurements and 5 photos 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. Corroborates the subsequent identification as a species of Ziphius. Suggests the misleading bulbous forehead of the Estevan specimen was 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-Natur.* 59:170-171.

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. Guiquet.

1952. Three cetacean records from British Columbia.

Murrelet 33(1):10-11.

1. Lagenorhynchus obliquidens (Gill): A skull found in June 1943, at Estevan Point, Vancouver Island.
2. Stenella euphrosyne (Gray) : A skull found in Nootka Sound, Vancouver Island, during the winter of 1948.
3. Ziphius cavirostris (Cuvier) : Skull from Fisherman's Bay, Cape Scott, Vancouver Island, found in 1950. It was badly worn. Also, 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. *Natur. 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.

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 6 species of whale (fin, sei, blue, humpback, **Bryde's** and sperm) . Values given for each of 6 areas in the North Pacific. Age composition given for sei population.

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) . In S. M. Konovalov (cd.), *Issledovanya po biologii ryd i promyslovoj okeanografii, Vypusk 5*, p. 145-152. *Tikookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr.* , Vladivostok, USSR. (English abstr., *Biol. Abstr.*

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 7.0 m and the largest immature male was 8.1 **m long**. Females were found to attain sexual maturity at the length of 8.0-8.1 m. The pregnancy lasts 10-11 months; calves measuring 300-330 cm at birth.

Fay, **F. H.**

1952. The Pacific walrus: a progress report of field investigations conducted during 1952. processed rep., **ONR-77**, Arctic Inst. North Am., Montreal, Quebec, Canada, , 17 p.

During May and June 1952, 191 walruses' were examined from St. Lawrence Island. Distribution patterns are sketched out. Aging 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**.

1953. The Pacific walrus: a progress report of laboratory work on the specimens collected in the 1952 field season. Processed rep., **ONR-77**, Arctic Inst. North Am., Montreal, Quebec, Canada, 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. **Processed rep.**, **ONR-77**, 01. Arctic Inst. North Am., Montreal, Quebec, Canada, 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 . tusks; teeth, claws and body measurements of walruses indicate no method is an exact age determinant for all age classes and both sexes.

Fay, F. H.

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

The life history is given, detailing reproduction, the young, growth and mortality. The distribution is defined by accessibility to food, air, haul-outs, as well as the ambient air temperature. The need to breathe forces walrus 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 walrus to coasts or the ice front where floes are common. In addition, the major food (**pelyceps**) can be found in 0-50 fathoms of water. Obviously, 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., Wildl. Manage.** Inst., Washington, D. C., 15 p.

From 1650-1850, the population (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 walrus were observed below 60°N latitude. There was little change in the population from 1930 to 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. Alaska Coop. **Wildl. Res. Unit.**, U. S. Pub. Health Serv., Arctic Health Res. Center, Anchorage, Alaska, 54 p.

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 alternative sources of walrus products. People of **Gambell** are discussed with regard to future management strategy. Management should decrease the 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 the Island in late summer and fall. 7 tables.

Fay, F. H.

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

Zoonoses are diseases of 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.

- 1974a. The role of ice in the ecology of marine mammals of the Bering Sea. In D. W. Wood and E. J. Kelley (eds.), *Oceanography of the Bering Sea*, p. 383-399. *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. Good detail. Good understanding of habitats. Insights into evolution.

- 1974b. Mammals and birds. Seminar given 7-11 October. **Unpubl. manuscr.** Avail., U. S. Dep. **Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv.**, Northwest Alaska Fish. Center. Mar. Mamm. Div., Seattle. 8 p.

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 8 federal agencies, Alaska Department of Fish and Game and 4 universities; (3) brief account of birds: estimated numbers and biomass, paucity of knowledge, recent study by U. S. Fish and Wildlife Service. Noteworthy items 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.

Fay, F. H.

1975a. Morbidity and mortality of marine mammals. Ocs quarterly report for quarter ending 30 September 1975. Processed rep. U. S. Dep. **Int.**, Bur. Land Manage., Seattle, Washington. 5 p.

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 Penuk Islands; and Kotzebue Sound from **Sheshalik** to Point Hope. Nearly 400 carcasses were found. Well over half of these were walrus, and there were 13 species in all. Causes of death included gunshot, trauma, predation, hemorrhage and probable bacterial infection. 3 maps.

1975b. The Pacific walrus: biology and population dynamics. Project 6: marine mammals. Protection of nature and the organization of preserves, US - USSR Environment Protection Agreement. US - USSR Mar. Mammal. Meet., 3-12 June 1975, Leningrad. 8 p.

Excellent distribution and migration patterns given. December to April 2/3 of the population resides SSW of St. Lawrence Island, and the remainder in the SE Bering Sea (Bristol Bay, **Pribilofs**). Northward migration occurs in April to June through the Bering Strait. July to September is spent in the NW **Chukchi**. Some herds venture into the Beaufort Sea. Migration south occurs October to December. Eight thousand to 10,000 males remain in the Gulf of Anadyr and Bristol Bay. Aerial survey data indicate a minimum of 101,000 animals in 1970 and 124,000 in 1972. The diet varies seasonally, geographically, and with age and sex. From food consumption of captive walruses it is calculated the entire population may consume 1.5 - 2 million **tons/yr**. Snails and clams comprise the bulk of the diet in spring and summer, but tunicates and crustaceans may be important in winter. In times of scarcity, fish and seals may be taken. Interspecific competition is most important with respect to Erignathus barbatus.

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., trans. 432, 1969, 11 p.)

During aerial surveys in late September to late October 1960, walruses were counted. Estimates the total number of Pacific walrus to be 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.

Fedoseev, G. A.

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. 58:173-177.** In Russian. (Transl. by Dep. Int., Bur. Commer. Fish., Seattle, Washington, 1966, in K. I. Panin (cd.), Soviet research on marine mammals of the Far East, p. 98-102.)

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 **Serditse-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-ekologicheskaya kharakteristika populyatsiy krylalki 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. 86:158-177.** In Russian. (Transl. by Dep. Environ., Fish. Mar. Serv., Ste. Anne de Bellevue, Quebec, Transl. Ser. 3365, 1973, 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 quoted as 80,000-90,000 in 1964, and 60,000 in 1969. Emphasizes the need to cease hunting the ribbon seal.

Fedoseev, G. A.

1975. **Ecotypes** of the ringed seal (*Pusa hispida* Schreber, 1777) and their reproductive **capabilities**. 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** 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 gulfs (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. "

1976. Summary of the results and main aspects of investigations of seals of Phocidae family and walrus of the northern Pacific Ocean. Paper presented Mar. **Mamm. Meet.**, Moscow, USSR, January 1976, 12 p.

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 introspective structure of ringed seals in the Arctic). **Izv. Tikhookean. Nauchno.-issled. Inst. Rybn. Khoz. Okeanogr.** 71:301-307. In Russian. (Transl. by Fish. Res. Board Can., Mar. **Ecol. Lab.**, Dartmouth, Transl. Ser. 2411, 1972, 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** Mar. **Mamm. Meet.**, Moscow, USSR, January 1976.

The skulls of **196** ribbon seals and **123 larga** seals were analyzed. Apparently the **larga** seals form 3 **local** populations around 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.

1972. Northern fur seal - **Steller's** sea bear. In A. Seed (cd.), Seals, sea lions and walruses in **eastern North Pacific** and arctic waters, p. 5-11. Pacific Search Books, Seattle, Washington.

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 comings and goings 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.

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. Post partum 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.** 479, 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. W. Withrow.

1976. Seasonal distribution and relative abundance of marine mammals in the Gulf of Alaska. Processed rep., U. S. Dep. Comber., **Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Mar. Mamm. Div., Seattle, Washington, 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.

Fiscus, Clifford H., and Hisoshi 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 from 7 April to 1 June, and in the Bering Sea from 4 July to 8 September.

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

Pelagic research was conducted off Washington (2-24 April) and off California (11 April to 23 June). Seals were most abundant from 30 to 40 miles offshore. 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. Processed rep., U. S. Dep. **Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Seattle, Wash., 23 p.**

Eight Alaskan communities engaged in bowhead whaling in 1974: Kaktovik (Barter Island), **Nuiqsut**, Barrow, Wainwright, Point Hope, **Kivalina**, **Gambell** and **Saboonga**. 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. 7 tables.

Fiscus, Clifford H., Karl Niggol, and Ford Wilke.

1961. Pelagic fur seal investigations, California to British Columbia, 1961. Processed rep., U. S. Fish Wildl. Serv., Mar. Mamm. Biol. Lab., Seattle, Washington, 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 lutes 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.

A floating carcass of M. steinegeri (True) was 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. Processed rep., U. S. Fish and Wildl. Serv. Bur. Commer. Fish., Mar. Mamm. Biol. Lab., Seattle, Washington, 13 p*

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.

Foot, Don Charles.

1965. Exploration and resource utilization in northwestern arctic Alaska before 1855. Ph.D. Thesis, McGill University, Montreal, Quebec, Canada. 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.

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. Immunogenetics 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, Berardius bairdii, Physeter catodon, Balaenoptera edeni, Balaenoptera musculus, Megaptera nodosa.

Gaskin, D. E., P. W. Arnold, and B. A. Blair.

1974. Phocoena phocoena. Mamm. 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.

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 227 kg. of sauries.

Gill, T.

1873. The Ribbon seal of Alaska. Am. Natur. 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 shorewhalers shows 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. D. W. Rice (ed.), Prelim. Rep. Mar. Mamm. Res., U. S. Fish Wildl. Serv., Seattle, 70 p.

A report on the gray whale that offers 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 Humbolt Bay, California.

Gol'tsev, V. N.

1968. Dinamika beregovykh lizhbishch morzha v svyazi s ego raspredeleniem i chislennost'yu (Dynamics of coastal walrus rookeries in connection with distribution and numbers of walrus). Izd. "Pishch. Prom.", Moscow. In Russian. (Transl. by Israel Program Sci. Transl., 1971, in V. A. Arsen'ev and K. I. Panin (eds.), Pinnipeds of the North Pacific, p. 201-212. Avail., U. S. Dep. Comber., Natl. Tech. Inf. Serv., Springfield, Virginia, as TT 70-54020.)

From studies performed mainly in 1960, 1962, 1964 and 1965, on 4 main coastal rookeries, the 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.

- 1972.** (Distribution and assessment of numbers of the Pacific Walrus in the autumn of 1970.) In *Morskije Mlekopitayushchie*, p. 146-148, (Fifth All-Union Conf. Study Mar. Mamm., 19-21 Sept. 1972, **Makhachkala**). **Makhachkala:** Akad. Nauk SSSR Zool. Inst. Evol. Morfol. Ekol. Zhivotn., Inst. Biol. Razvit., Minist. Rybn. Khoz. SSSR, **Ikhtiol. Ken.**, **VNIRO Kasp.** (Abstr. transl. by F.H. Fay, Univ. Alaska, Fairbanks, Alaska, 1974, 3 p.)

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

Gudkov, V. M.

1962. O svyazyakh v raspredelenii **zooplanktona**, morskikh ptits i usatrkykh kitov (Relationship between the distribution of **zooplankton**, seabirds and baleen whales). Tr. Inst. Okeanol., Akad. Nauk SSSR **58:298-313.** (Transl. by Dep. Nav. Oceanogr. Off., **Washington, D. C., 1974, 16 p.**)

Observations were made during a 1955 expedition to the Bering Sea. There was 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**, **fork-tailed** 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 available. Also, sightings made from the Canadian weathership 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. In W. E. Schevill (ed.), **The whale problem**, p. 27-52. 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. 5 tables, 2 figures. Figure maps world distribution of zooplankton. Detailed distributions of whales and zooplankton are not discussed.

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 Phocoena vomerina (Gill) was caught in August 1952, in a net at 71°02'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 given.

Hanna, G. D.

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

Skeletal remains of cetaceans reported in this 1916 July survey included bowhead, humpback, **sulphur-bottom**, killer and Baird's whales. **Pinnipeds** seen nearshore included the hair seal (Phoca sp.), and walrus. Fur seals were common to within 8 miles of St. Matthews.

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

Records rare sightings and strandings of 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). (Abstr.) Proc. 22nd Alaska Sci. Conf., 17-19 August, College, Alaska, p. 138.

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.

Hatler, D. G.

1971. A Canadian specimen of **Risso's** dolphin (Grampus griseus). Can. **Field-Natur.** 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-Natur.** 88:449-459.

Observations from Vancouver Island were made in 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.

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 (Colodabis saria). A large, incompletely swallowed shad 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 stomach 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 echosounder. 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 from SE Alaska, gadids (cods) were common. During July-August, shrimp appeared to be a preferred prey. From 15 sea lions, it appeared that pollock was the predominant food; commercially important fish comprised 14% of the stomach contents. The Copper River sea lion population was estimated at 6,000; for SE Alaska, 3,000 animals.

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. Mortality rate for adults is given as 0.06. Methods of stock assessments were detailed, but no population estimates given.

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. (English 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.

Johnson, A. M.

1975. The status of northern fur seal populations. 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 - **400**. Methods of estimating yearly pup populations are discussed. 1 fig., 2 tab.

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 Islands, 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. In Norman J. **Wilimovsky** (ed.), Environment of the **Cape Thompson** region, Alaska, p. 877-923, 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. The following animals were collected: 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 (in part): "**The ringed seal is** present in abundance from November through June. Pups are born in late March. Mating., with an 86.7% pregnancy rate, occurs in April and May. 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. **Brousseau**.

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.* 44:122.

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.

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 odontocete sightings recorded during oceanographic aerial surveys 1959-1970, comprising 171,809 nautical miles flown. Describes conditions of observation.

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 3/4 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.

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. 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 described include: Alaska, British Columbia, Washington and California. Discussion mentions migration, numbers of whales, biology (lengths 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, a halibut fisherman, has been bothered by sea lions. Based on **Kitka's** observations, sea lions do not go below 100 fathoms; fur seals do not usually go below 30 fathoms.

Kenyon, Karl W.

1960a. Aerial survey of walrus in northern Bering Sea, 23 February to 2 March 1960. **Unpubl. manuscr.**, Dep. Int. U. S. Fish and **Wildl.** Serv., Seattle. 23 p.

Areas surveyed were: 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% were 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.

1960b. 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**.

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

Eskimo hunting of walrus on St. Lawrence, Little Diomedé, Round and Walrus Islands in 1958 were discussed. Walrus 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 walrus killed, at least half are lost.

1961a. **Cuvier** beaked whales stranded in the Aleutian Islands. J. Mammal. 42(1):7;-76.

Two carcasses of Ziphius cavirostris found on **Amchitka** Island, apparently shot by rifle. Complete measurements given. 3 plates.

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.

Kenyon, Karl W.

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 tables, 1 fig., 1 photo.

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

Presents information gathered during the spring of 1958 (11 May to 14 June) on the hunting and biology of ringed, bearded, ribbon and harbor seals. Most of the article concerns ringed and bearded seals, which are taken by the hundred or so 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 tables.

1965. Aerial survey of sea otters and other marine mammals, Alaska Peninsula and Aleutian Islands; 19 April to 9 May 1965. 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, p. 1-52. Processed rep., U. S. Fish **Wildl.** Serv., Eur. Sport Fish. **Wildl.**, Seattle, Washington.

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 and killer whale.

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. 1 fig. (map), 2 tables.

Kenyon, K. W., and V. B. Scheffer.

1955. The seals, sea lions, and sea otter of the Pacific Coast. U. S. Fish Wildl. Serv. Circ. 32, (Rev. of Wildl. Leaflet 344, 1953.) U. S. Govt. Print. Off., Washington, D. C., 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 minor 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 monograpicheskogo issledovaniya viola (**Beluga**. (Delphinapterus leucas) investigation of the species) . Izd. "Nauka", Moscow. In Russian. (Transl. by Israel Program Sci. Transl. , 1969, 376 p., avail., U. S. Dep. Comber. , Natl. Tech. Inf. Serv., Springfield, Virginia, 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. There is a feeding dimorphism by age and sex. The food items include arctic cod, **capelin**, **salmonids**, **flatfish**, herring and crustacea. Distribution patterns along the USSR coast are explicit. **Belugas** are found in the Bering Strait in February and May-June. No information offered along the Alaskan shore. 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. Project Rep., Fed. Aid Wildl. Restoration, Vol. VII, Alaska Dep. Fish Game, 11 p.

A general article which discusses 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 Lat. 400N (have been seen up to 60 miles upstream from the mouth of the Yukon River) . Population in Bristol Bay (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 managements.

1967. Birth of a harbor seal pup. J. Mammal. **48(4):677**.

On **15** June 1967 a female 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.

Klinkhart, Edward.

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.

(Abstracted from 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 14-15 m long. Mating in right whales takes place in December and January; gestation is 11-12 months. Calves at birth are 5-6 m 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 16-17 m. Analysis of food showed that right whales are stenophags. The main food of right whales in the Northern Hemisphere is **Calanoida**.

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 refs.

Kosygin, G. M.

1966a. Nekotorye materialy po pitaniyu lakhtaka v Beringovom more v **vesenne-letniĭ** 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. **Khodz. Okeanogr.** 58:153-157. In Russian. (Transl. by Dep. **Int., Bur. Commer. Fish.,** Seattle, Washington, 1966, in K. I. Panin (cd.), Soviet Research on Marine Mammals of **the** Far East, p. 78-82.)

In spring-summer of 1963, 37 adult 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° Long. x 1/2° Lat.) Knowledge of distribution of **benthic** species and knowledge of bearded seal feeding is reviewed. Stomach contents examined are discussed and tabulated. Decapods, gastropod and **polychaetes** predominated. 9 ref.

- 1966b.** Raspredelenie i nekotorye cherty **biologii lastonogikh** Beringova morya - **Vesenne-lentii** 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. 58:117-124.** In Russian. (Transl. by Dep. Int., Bur. Commer. Fish., Seattle, Washington, 1966, in K. I. Panin (cd.), Soviet Research on Marine Mammals of **the** Far East, p. 40-49.)

Describes distribution of ribbon, harbor 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 **vesenniĭ** 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. 58:125-128.** In Russian. (Transl. by Dep. Int., Bur. Commer. Fish., Seattle, Washington, 1966, in K. I. Panin (cd.), Soviet Research on Marine Mammals **of** the Far East, p. 50-53.)

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 Seas during the **spring-summer period**). **Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. 75:144-151.** In Russian. (Transl. by Fish. Mar. Serv., Ste. Anne de **Bellevue**, Quebec, Can., Trans. Ser. 3747, 1976, 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.

Krylov, V. 1.

1966. **Vozrastnoi i polovoi sostav, plotnost' zaleganiya tikhookeanskogo morzha na l'dakh i beregovykh lezhibishchakh** (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. 58:97-103.** In Russian. (Transl. by Dep. Int., Bur. Commer. Fish., Seattle, Washington, 1966, in K. I. Panin (ed.), Soviet Research on Marine Mammals of **the** Far East, p. 19-26.)

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 m² 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 m² per animal. Hauling grounds with the highest density were comprised of females with young. Further detail on age of animals is given.

.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). **Izd. "Pishch. Prom."**, Moscow. In Russian. (Transl. by Israel Program Sci. Transl., in V. A. Arsen'ev and K. I. Panin (eds.), **Pinnipeds of the** North Pacific, p. 185-200, 1971. Avail., U. S. Dep. Commer., Natl. Tech. Inf. Serv., Springfield, Virginia, as TT 70-54020.)

From aerial surveys of the western **Chukchi** and **Wrangel** Island area in 1961, 30,000 walrus 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%.

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., U. S. Dep. Commer., Nat. Tech. Inf. Serv., Springfield, Virginia, 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 tables.

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.

1976. Status of northern fur seals. *Food Agric. Organ., U. N. Adv. Comm. Mar. Resour. Res., FAO ACMRR/MM/SC/34*, 50 p.

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, C., 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.. Center, San Diego, California, 184 p.

Thirty cetaceans found in the North Pacific are grouped into 6 categories based on size and presence of a dorsal fin. Animals are described in an index by swimming, color, blowhole, and **blowing** and diving characteristics. More detailed descriptions of each species are offered with information on distribution, physical characteristics, food items and other animals that it may be confused with.

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. Includes distribution map.

Lentfer, J. W.

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

A female northern fur seal was killed in early September 1969, 65 km southwest of Wainwright, Alaska, at approximately **70°16'N, 161°15'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.

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

Describes **polar** bear den found 168 km northwest of Point Barrow, at **72°11'N, 160°42'W**, on drifting **multiyear** ice. Den was found by backtracking from female and cub tagged a few kilometers away.

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 Lat. **50°52'N**, Long. **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** and **1959** coupled with information from Eskimos, suggest grey whales can be found in Arctic waters. 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.**

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.

Marine Mammal Biological Laboratory.

1969. Fur seal investigations, 1966. U. S. Fish Wildl. Serv., **Spec. Sci. Rep. Fish. 584**, 123 p.

In 1966, 52,497 male and 391 female fur seals were killed on the **Pribilof** Islands. 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 studies as well as land investigations are reported. Research was conducted off central and southern California, 21 January - 25 March. Seals were most numerous near abrupt changes of depth, i.e., the Continental Shelf, sea valleys and sea mounts. Out of 444 seals collected, 428 were females, half of which were gravid. Stomach contents are reviewed.

Marine Mammal Biological Laboratory.

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

In 1967, 55,720 male and 10,471 female fur seals were killed on the **Pribilof** Islands. 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 US and USSR 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 Bering Sea and 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. **Natl. Mar. Fish. Serv.**, **Spec. Sci. Rep. Fish.** 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. In 1968, 45,625 male and 13,335 female fur seals were killed on the **Pribilof** Islands. 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. **Pelagically**, 374 seals were collected off Washington and 456 off Alaska. Prey species are given.

1971a. Fur seal investigations, 1969. U. S. **Natl. Mar. Fish. Serv.**, **Spec. Sci. Rep. Fish.** 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.

Marine Mammal Biological Laboratory.

1971b. Fur seal investigations, 1970. Processed rep., US Fish Wildl. Serv., Bur. Commer. Fish., Seattle, Wash., 155 -p.

In 1970, 42,121 male and 120 female fur seals were killed on the Pribilof Islands. 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. Processed rep., US Fish Wildl. Serv., Bur. Commer. Fish., Seattle, Wash., 132 p.

In 1971, 31,795 male and 103 female fur seals were killed on the Pribilof Islands. Report includes information on: counts of adult males; counts of dead fur seals; causes of death among pups; pup weights; marking of pups; pup population estimates, and seals found off Washington in pelagic study.

1973. Fur seal investigations, 1972. Processed rep., US Fish Wildl. Serv., Bur. Commer. Fish., Seattle, Wash., 93 p.

The kill of fur seals was 37,314 males and 79 females on the Pribilof Islands. Activities on the Pribilof Islands included: counts of living adult males; count 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.

1977. Birds and mammals observed at sea 1958-present. Unpubl. data listing, U. S. Dep. Commer., Natl. oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Seattle, Washington.

An on-going compilation of marine mammal sightings from pelagic fur seal cruises, comprising 25 species. Each species is broken down by geographical area (e.g., Gulf of Alaska, Bering Sea). Latitude and longitude are given for each sighting.

Marine Mammal Division.

1974. Fur seal investigations, 1973. Processed rep., U. S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Seattle, Washington, 96 p.

In 1973, 28,457 male and 25 female fur seals were killed on the **Pribilof** Islands. Information from the **Pribilof** , Studies includes: counts of adult males; counts of dead fur 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.

1975. Fur seal investigations, 1974. Processed rep., U. S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Seattle, Washington, 125 p.

In 1974, 32,976 male fur seals were harvested and 51 females were unintentionally killed on the **Pribilof** Islands. **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 observed 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. Processed rep., U. S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Seattle, Washington, 115 p.

(1) **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. (2) 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. (3) San Miguel Island and Castle Rock: The pup count showed 725 pups, a 39% increase over 1974; nocturnal behavior and vocal activity were investigated. (4) Pelagic study: Data collected during cruises 1958-1974 were compiled and preliminary analysis made with emphasis on consumption of walleye **pollock**.

Mathisen, Ole A.

1959. Studies on **Steller** sea lion (*Eumetopias jubata*) in Alaska. Trans. 24th North American **Wildl. Conf.**, 2-4 March 1959, p. 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 June; births 25 May-27 June; pups managed alone by end of July. Reduction of sea lions is suggested with respect to salmon (and halibut) predation. 2 photos.

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.

Rookery on Chernabura Island observed 18 May to 25 July 1958. Authors' abstract: "**Steller** sea lions (*Eumetopias jubata*) were observed from May to July. 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. Copulation was observed from 31 May to 10 July, parturition from 24 May to 27 June. 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."

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, U. Wash.), U. S. Fish and **Wildl.** Serv. **Spec. Sci. Rep. Fish.** 424, 20 p.

Author's 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.

Mitchell, E.

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.

Miyazaki, N., T. Kusaka, and M. Nishiwaki.

1973. 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, K., and K. Yoshida.

1965. On the porpoises caught by the salmon fishing **gillnet** in the **Bering Sea and the North Pacific Ocean**. **Fat. Fish, Nagasaki Univ., Bull.** 19, 21 p. In Japanese. (Engl * sum.)

Phocoenoides dalli is found in greater abundance east of **175°W**, but Japanese fishermen do not fish that far east.

Mizue, Kazuhiro, Kazumoto Yoshida, and Akira Takemura.

1966. On the ecology of the Dan's porpoise in the Bering Sea and the North Pacific Ocean. *Fac. Fish., Nagasaki Univ.*, Bull. **21,21** p. In Japanese. (Engl. summ.)

From Dan'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.

Moore, J. C.

1963. Recognizing certain species of beaked whales of the Pacific Ocean. *Amer. Midl. Natur.* **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 sub-arctic 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 distribution 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 50-60°N Lat. but extends as far south as 45°N. In 1944 an arch beaked whale (M. carlhubbsi) was found in Grays Harbor, Washington. It's distribution is usually considered to be the temperate Pacific, south of the range of M. stejnegeri.

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. 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, and 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; Dan porpoise - seen twice.

Naito, Y.

1976. Harbor seal in the North Pacific. Food Agric. Organ. U. N., Adv. Comm. -Mar. Resour. Res., FAO **ACMRR/MM/SC/44**, 13 p.

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 Pt. Barrow to Mexico. **They are** 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.

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 whales, a **fin** whale, and an unidentified whale, and also shows some previous sightings of gray whales in the Bering Sea. 11 fig.

Nasu, Keiji.

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

Data was obtained by whaling factory and whale marking boats in the North Pacific Ocean and Bering and Chukchi Seas. Extensive oceanographic data 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. 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. 59 ref.

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; affect 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** food species. 43 tab., approx. 40 charts, 149 ref.

Nemoto, Takahisa.

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 Calanus cristatus coincide with fin whale feeding grounds; Calanus 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 Islands.

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.

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 on Isla **Magdalena**, Baja California.

Nichols, J. T.

1950. Additional data on the occurrence of Dan'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 53036'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. Marine Mammal Biological Laboratory, Seattle, Washington, 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. Processed rep., U. S. Fish Wildl. Serv., Marine Mammal Research, Seattle, Washington, 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.** (English abstr. in **Biol. Abstr.**, 1963, 92 (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. **Ikhtiolog. Komm. 12:214-217.** (Transl. by U. S. Dep. Comber., **Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Div. Foreign Fish., Transl. 520**, 1970.)

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, Ikhtiolog. 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, loriculate 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 regrouping of the **Kuril** sea otter). Tr. **Atlant. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr. 39:171-178.** In Russian. [Transl. by Fish. Mar. Serv., Ottawa, Canada, **Transl. Ser. 3185**, 1974, in K. K. **Chapskii and E. S. Milchenko (eds.)**, **Research on marine mammals**, p. 274-283.]

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. Chkotskii morzh (Chukotsky walrus). *Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr.* 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 Chukotski 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.

1947. *Bilolgicheskaya 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.* 25:226-228. In Russian. (Transl. by Fish. Res. Board Can., Arctic Unit, Montreal, *Transl. Ser.* 115, 1957, 4 p.)

From 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, Masahuru.

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. *In*, K. S. Norris (ed.), *Whales, dolphins and porpoises*, p. 171-191, Univ. Calif. Press, Berkeley.

Whaling catches reported for 1945-1962 for blue, fin, hump-back, 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° squares of area. Months of whaling activity are noted. Population estimates offered.

Nishiwaki, Masahuru.

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.

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 US, the USSR, 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.

North Pacific Fur Seal Commission.

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.

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 Dan 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.

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 north of 200N 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, S., M. Nishiwaki, and T. Hibiya.

1958. Growth of fin whales in the Northern Pacific. Sci. Rep. Whales Res. Inst. 13:97-133.

Data was collected on whales caught from 1952 to 1957, in the North Pacific from 480N 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. 17 tab., 8 graphs.

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 plates, 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 **Akutan**, and (3) south of **Akutan**, 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. 8 plates, 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 tables, 5 maps.

1974. Research on whale biology of Japan with special reference to the North Pacific stocks. In W. E. Schevill (cd.), *The whale problem: a status report*, p. 196-208. 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). Table of stock assessment provided.

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 630N but some have been sighted in the Chukchi Sea. Their principal food items are calanoid copepods and euphausiids.

Orr, R. T.

1965. 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 given. Summary of the records of Grampus griseus on the Pacific coast is provided.

Osgood, Wilfred H., Edward A. Preble, and George H. Parker.
1915. 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, dis-
covered in the Pribilofs in '1.786, 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 18.89.

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.
Kho Z. Okeanogr. 58:235-236. In Russian. (Transl. by Dep.
Int., But. Commer. Fish., Seattle, Washington, 1966, in
K. I. Panin (cd.) , Soviet research on marine mammals of the
Far East, p. 140-141.)

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.
Bontents 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. 58:23-40. In Russian. (Prelim. transl. by Fish.
Res. Board Can., Biol. Sta., 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
consumption was calculated to be 1700 g per day: 1,020 g
fish, 680 g squid (live weight). Qualitative differences
in stomach contents for different age and sex groups were
not detected. 6 tables, 6 fig.

Panina, G. K.

1971. Kharakter raspredeleniya **kotikov, zimuyushchikh v Yoponskom more** (Distribution of fur seals wintering in the Sea of Japan). **Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. 82:14-24.** In Russian. (Transl. by Fish. Res. Board Can., Arctic Biol. Sta., Ste. Anne de Bellevue, Quebec, Canada, **Transl. Ser. 2571, 1973, 18 p.**)

From 1959 to 1968, between January and May, a total of 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 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. North Amer. Wildl. Natur. Resour. Conf. 34:74-79.**

Authors report on two years of study, concentrating on the northern elephant seal and California sea lion, 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, Año 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, Richard S., B. J. LeBoeuf, 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. The first was taken on 5 July 1950, 10 miles off Kains Island. The second was taken on 9 August 1951, 20 miles east southeast of Cape St. James. Measurements are 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 Lagenorhynchus obliquidens 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.**

Gives distribution as **69°N** to **33°N**. 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. 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. Route between British Columbia and Bering Sea is uncertain. Feeding observations are given. 4 fig.

Pike, G. C., and I. B. MacAskie.

- 1966.** Report on Canadian pelagic fur seal research in 1966. Manusc. Rep. Ser. (**Biol.**) 875, Fish. Res. Board Can., **Biol. Sta.**, Nanaimo, British Columbia, 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 tables, 5 fig.

1967. Report on Canadian pelagic fur seal research in 1967. Unpub 1. **manusc.**, Fish. Res. Board Can., **Biol. Sta.**, Nanaimo, British Columbia, 15 p.

(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 tables, 2 fig.

1968. Report on Canadian pelagic fur seal research in 1968. Unpub 1. **manuscr.**, Fish. Res. Board Can., **Biol.** Sta. , Nanaimo, British Columbia, 20 p.

(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 tables, 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. Unpub 1. **manuscr.** , Fish. Res. Board Can., **Biol.** Sta. , Nanaimo, British Columbia, 16 p.

(See Pike, Spalding, et al., 1958.) From April to June, seals were hunted off Vancouver Island. 9 tables, 3 fig.

1966. Report on Canadian pelagic fur seal research in 1965. Unpubl. **manuscr.** , Fish. Res. Board Can., **Biol.** Sta. , Nanaimo, British Columbia, 17 p"

(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 US. Reproductive data were compared among seals taken by the US, the USSR, Japan and Canada. 7 tables, 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**. The 1956 estimate was 11,000 - 12,000. Major changes over this period were in distribution and usage of different 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., Fish. Res. Board Can., Biol. Sta., Nanaimo, British Columbia, 51 p.

(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 tables, 5 fig., 17 charts.

1960. Report on Canadian pelagic fur seal research in 1960. Unpubl. manuscr., Fish. Res. Board Can., Biol. Sta., Nanaimo, British Columbia, 92 p.

(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). Detailed reproduction study is presented. 15 tables, 16 fig., 8 plates.

1961. Report on Canadian pelagic fur seal research in 1961. Unpubl. manuscr., Fish. Res. Board Can., Biol. Sta., Nanaimo, British Columbia, 35 p.

(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 tables, 5 fig.

1962. Report on Canadian pelagic fur seal research in 1962. Unpubl. manuscr., Fish. Res. Board Can., Biol. Sta., Nanaimo, British Columbia 35 p.

(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 tables, 9 fig.

1963. Report on Canadian pelagic fur seal research in 1963. **Unpubl. manusc.**, Fish. Res. Board Can., **Biol. Sta.**, Nanaimo, British Columbia, 29 p.

(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 tables, 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. manusc.**, Fish. Res. Board Can., **Biol. Sta.**, Nanaimo, British Columbia, 76 p.

Representatives of Canada, Japan, the USSR and the USA 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 tables, **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. 22:259-261.** In Russian. (**Transl.** by Fish. Res. Board Can., Montreal, Quebec, **Transl. Ser. 150**, 1957, 3 p.)

In the spring of 1939, the stomachs of 377 seals taken from the Shantar Sea and the **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, in Donald G. **Calkins**, Kenneth W. Pitcher, and Karl **Schneider**, Distribution and abundance of marine mammals in the Gulf of Alaska. (**Unpubl. manusc.**) Alaska Dep. Fish Game Rep., 31 p., 19 charts.

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; total 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 Dan porpoise, minke whale, humpback whale, killer whale and northern fur seal. Charts show sea otter and harbor seal distribution.

Popov, L. A.

1976. Status of main ice forms of seals inhabiting waters of the USSR and adjacent to the country marine areas. Food Agric. Organ. U. N., Adv. Comm. Mar. Resour. Res., FAO ACMRR/MM/SC/51, 17 p.

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 to 80,000; ribbon seal, 60,000. in 1969; bearded seal, 250,000; **largha** 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 200 m deep on benthic crab, shrimp (**Gragonidae**), mollusks (Gastropod) and **polychaetes**. The **largha** 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 they feed on salmonoids.

Potelov, V. A.

1975. Biological background for determining the abundance of bearded seals (**Erignathus barbatus**) and ringed seals (**Pusa hispida**). 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.

1972. Distribution of sea mammals and associated land mammals found along the Katmai coast, Katmai National Monument. Science in Alaska, **Proc. 22nd Sci. Conf.** 8 p.

Ten flights and 25 hours of observation from a boat were conducted by Park Service personnel from July 1969 to June 1971, along the coast of the Katmai Peninsula, 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.

Ramsey, D. H.

1968. Diurnal fluctuations in censuses of migrating California gray whales. Norsk Hvalfangst-tid. **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 glaucus). 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, P. H.

1885. "Narrative" and "Ethnographical sketch on the natives of Pt. Barrow." In Report of the International Polar Expedition to Point Barrow, Alaska, p. 19-88. Govt. Print. Office, Washington, D. C.

Observations at Pt. Barrow from 8 September 1881 to 29 August 1883, on seasonal appearances of birds and marine mammals. Also describes human ecology of Pt. Barrow eskimos. Seals are a mainstay of the diet. Within 2 or 3 years of the early 1850's, 24 bowhead whales were taken. Only 2 were taken in the 1882 and 1883 seasons due to a great decrease in the bowhead population.

Rice, Dale W.

1965. Synopsis of the biology and history of the gray whale. Unpub l. manuscr., Bur. Commer. Fish., Mar. Mamm. Biol. Lab., Seattle, Washington. 14 p.

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 - 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 and a minke whale were found in the stomachs of 10 killer whales. The animals were collected between Kodiak Island, Alaska, and San **Miguel** Island, California.

- 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 9 x 9 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. In **W. E. Schevill** (ed.), The whale problem, p. 170-195. Harvard Univ. Press, Cambridge, Mass,

The 11 large cetaceans of the eastern N. 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 IWC. Their estimated numbers: fin, 9,000 recruited; sei, 28,000 recruited; sperm, several hundred thousand. **Bryde's minke**, and giant **bottle-nose** whales have unknown population sizes and are unexploited. Population data 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.

In Press. A list of the marine mammals of the world. U. S. Fish Wildl. Serv. Spec. Rep.

Author's abstract: Listed are the 116 species of recent marine mammals, including freshwater species of the predominantly marine groups. The number 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.

Rice, D. W., and A. A. Wolman.

1969. Progress report on gray whale studies. Rep. submitted to Int. Whaling Comm., Mar. Mamm. Biol. Lab., U. S. Fish. Wildl. Serv., Seattle, Washington. 19 p.

Whale counts were made from Point Loma and Yankee Point, California, for 10 hours a day. Extrapolations made for night migration, poor visibility and offshore migration. Estimated population for 1968-69 was 10,000 animals.

1971. The gray whale: life history and ecology. U. S. Fish. Wildl. Serv., Bur. Comm. Fish., Mar. Mamm. Biol. Lab., Seattle, Washington. 142 p.

Monographic account of existing knowledge, incorporating results of author's 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 the exception of marking. Contents: introduction; nomenclature; field and laboratory procedures; seasonal migratory cycle; food and feeding; age and growth; female reproductive cycle; male reproductive cycle; predators; parasites and epizootics; population; exploitation, summary. From late May - 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 tables, 38 fig.**, 172 ref.

Robbins, L. L., F. K. Olhdam, 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 willoughbye), a deep sea animal. Another food item of importance was a species of giant squid (possibly Morateuthis 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. 34(2):251-252.

On 21 February 1952 a beaked whale (Ziphius cavirostris) 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, Alaska, 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 extensively. Male kills for 1966 are predicted. Female seals will not be purposefully 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 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.

Rudd, J. T.

1956. The blue whale. **Sci. Am. 195(6):46-50.**

A general treatment of the blue whale which briefly discusses taxonomy, whaling methods and biology. Migration patterns are unknown, but they congregate in polar regions in the summer to feed.

Saario, Doris J., and Brian Kessel.

1966. Human ecological investigations at **Kivalina.** In **N. J. Wilimovsky (cd.), Environment of the Cape Thompson region, Alaska, p. 969-1039.** U. S. Atomic Energy **Comm.,** (avail. , **Natl. Tech. Inf. Serv.,** Springfield, Virginia).

Describes seasons and ice conditions in which ringed seals and bearded seals occur. Eskimos 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 34 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. Processed Rep., **Fish. Agency Japan, 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.

Sandegren, Finn.

1975. **Sexual-agonistic** signaling and territoriality in the **Steller sea lion (Eumetopias jubatus)**. 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.

Scammon, C. 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. (See also *Amer. 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. . ." This must be what is known today as Eumetopias jubatus. 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. Reprinted 1968, Dover Publications, Inc., New York, 319 p.

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.

Scheffer, V. B.

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 January. 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 probably occurs in June. On 12 June a pup was observed "learning to swim". 1 photo.

1946. [Personal observation of Victor B. Scheffer, June 5, 1946.] Avail., U. S. Dep. Commer., **Natl. Oceanic Atmos. Adm., Natl. Mar. Fish. Serv., Mar. Mamm. Div., Seattle, Washington. 1 p.**

Two Dan porpoises sighted at the south **end of** Dixon Passage at 1900 joined by 3 more porpoises **which** travelled at the bow of the ship for 10-15 minutes. At 2000, 2 more were seen at the end of the entrance. VBS photo 1977. at 1/200 sec.

- 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 in the **Aleutians**. On 12 November 1947 a tooth from some species of *Mesoplodon* was found on Amchitka Island in the western Aleutians. A specimen of *Berardius bairdii* was stranded in the fall of 1948 near Unalaska.

- 1949b. The Dan 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 analysis done. 2 plates.

Scheffer, Victor B.

1950a. Porpoises assembling in the North Pacific Ocean. *Murrelet* **31(1):16.**

Two sightings are reported: (1) On 13 July 1949 at Lat. 43°N, Long. 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. Natur.* **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.

1953a. Measurements and stomach contents from eleven **delphinids** from the northeast Pacific. *Murrelet* 34(2): 27-30.

The 11 animals examined included 1 Phocoena 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 Lat. 45°N.

1958. Seals, sea lions and walruses: a review of the Pinnipedia. Stanford Univ. Press, Stanford, Calif. 179 p.

Gives the biological characteristics, species evolution, taxonomy and systemic account of the pinnipeds. World populations estimates offered by subspecies.

Scheffer, Victor B.

1973. Marine mammals in the Gulf of Alaska. In Donald H. Rosenberg (ed.), A review of the **oceanography and renewable resources** of the northern Gulf of Alaska, p. 175-207. Inst. Mar. Sci., Univ. of 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; Dan 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.

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.

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. Natur. **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, 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. Fare.

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.

Sergeant, D. E., and P. F. Brodie.

1969. Body size in white whales, *Delphinapterus leucas*. *J. Fish. Res. Board Canada* 26:2561-2580.

From author's 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. . . . 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 (1000-1500), with greater numbers further north. 2 tab., 3 fig.

Sergeant, D. E., and W. Hock.

1974. Seasonal distribution of bowhead and white whales in the eastern Beaufort Sea. In J. C. Reed and J. E. Sater (eds.), The coast and shelf of the Beaufort Sea, p. 70S-719, Arctic Inst. North Amer., Arlington, Virginia.

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.

Shaughnessy, P. D.

1975. Biochemical comparison of the harbor seals Phoca vitulina richardi and P. v. 'la'r'g'ha. Rapp. P.-v. Réun. Cons. int. Explor. Mer 169:70-73.

Blood from 126 Phoca vitulina richardi and 56 P. v. largha seals was 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** ikeana, **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. 72:89-92.** In Russian. (Transl. by Israel Program Sci. **Transl.** , 1972, p. 83-86 in P. A. Moiseev (cd.), Soviet fisheries investigations in the northeastern Pacific, Pt. 5, avail. **Natl. Tech. Inf. Serv.**, Springfield, Virginia, as TT 71-50127.)

Surveys conducted on two vessels in 1972 along the Pacific coast 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. 59:183-192.** (Transl. by U. S. Dep. Commer. , Bur. Commer. Fish. , Seattle, Washington, 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. Examination of sexual organs of both sexes revealed that parturition occurred from the end of March through the end of April. Mating time was determined to be from the end of April through the beginning of May. 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.

Shustov, A. P.

- 1965b. O vliyaniy promysla na sostoyanii beringomorskoj 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.* 59:173-178. In Russian. (Transl. by U. S. Dep. Commer., Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Mar. Mamm. Div., Seattle, Washington. 11 p.)

This study was undertaken from 1960-1963 in the 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 changed the reproductive rate of the population.

- 1965c. Pitaniye krylatki v Beringovom more (The food of ribbon seal in Bering Sea). *Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr.* 59:178-183. In Russian. (Transl. by U. S. Dep. Int., Bur. Commer. Fish., Seattle, Washington, 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 sexually dimorphic 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 meters. 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 for suitable rookeries.

- 1965d. Raspredeleniye krylatki v beringovom more (The distribution of ribbon seal (Histiophoca fasciata) in the Bering Sea). In E. N. Pavlovskii, B. A. Zenkovich, S. E. Kleinberg and K. I. Chapskii (eds.), *Morskiye Mlekopitayushchiye*, p. 118-121. *Izd. "Pishch. Prom."*, Mo SCOW. In Russian. (Transl. by U. S. Dep. Int., Bur. Commer. Fish., Office Foreign Fish., *Transl. No. 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 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, 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 voposu 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. , 1967, Problems of the North 11:219-224.)

Relative abundance of ribbon, **largha** 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-zapadno; **chasti** Beringova moria (Experiments in quantitative **aero-visual** survey of seals in the north-western part of the Bering Sea). In V. A. Arseniev, B. A. Zenkovich and K. K. **Chapskii** (eds.), Morskoe mlekopitaiushchie. Izd. "Nauka". In Russian. (Transl. by Fish. Res. Board Can., Transl. Ser. 1510, 1970.)

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 species seen. Concludes that ribbon seal population has decreased. 2 tables.

1972. O sostoyanii zapasov i raspredelenii nastoyashchikh **tyulenei** i morkha v severnoi patsifike (On the condition of the stocks and the distribution of true seals, and walrus in the North Pacific). In Morskoe Mlekopitayushchie, p. 146-147, (Fifth All-Union Conf. Study Mar. Mamm., 19-21 Sept., 1972, **Makhachkala**). **Makhachkala: Akad. Nauk SSSR Zool. Inst., Inst. Evol. Morfol. Ekol. Zhivotn., Inst. Biol. Razvit. ; Minist. Tybn. Khoz. SSSR, Ikhtiolog. Kom., VINRO Kasp. (Abstr.)** (Transl. by F. H. Fay, Univ. Alaska, Fairbanks, Alaska, 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 seals remain stable. From aerial surveys in 1969 and 1970, populations are estimated. Bering Sea: ringed seal - 50,000; **largha** - 135,000; bearded seal - 90,000; ribbon seal - 60,000; walrus - 101,000. Okhotsk Sea: ringed seal - 800,000; **largha** seal - 130,000; bearded seal - 180,000; ribbon seals - 140,000. After 10-year protection, walrus stock has increased from 50,000 to 101,000 - 103,000.

Sleptsov, M. M.

1955. **Bilolgiya 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 molluscs, 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. Office, Washington, D. C., Transl. 478, 1970, 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 zooplankton conditions whose biomass was estimated as 450-800 mg/m³ in September 1948. Predominant species were Calanus cristatus, C. finmarchicus, Thysanoessa rashii and 'T.' inermis. The small cetaceans occurring in the Chukchi include :

(cont.)

Phocoena phocoena vomerina, Phocoenoides dalli, Orcinus orca and Berardius bairdii. Delphinapterus leucas, Balena mysticetus, and Monodon monoceros are believed to be permanent residents. Other species occasionally present include Rhachianectes glaucus, Balaenoptera acutorostrata, Balaenoptera borealis, Balaenoptera physalus, Sibbaldius musculus and Megaptera nodosa.

- 1961b. Raiony nagula kitov v Beringovom more (Feeding regions of whales *in* the Bering Sea). Tr. Inst. Morfol. Zhivotnykh Akad. Nauk SSSR 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., Beardius 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.

Report of a stranding in July 1950 of a Berardius bairdii at Ocean City, Washington. This is the first specimen recorded. Detailed measurements given. Food items reported as squid and octopus from Japanese waters, but Berardius filled with herring are occasionally found. The authors argue that Berardius bairdii has probably been mistakenly called a Hyperoodon (bottlenose whale) by whalers. so, records of Hyperoodon may be transferred to the literature on Berardius in the North Pacific.

Smith, T. G.

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 esturine, 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 the beluga to be 4,000.

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 2,113 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 off-shore. No interspecific competition was found. Predation on commercial fish was deemed negligible. Distribution and migration are discussed.

Sund, P. N.

1975. Evidence of feeding during migration and of an early birth of the California grey whale (*Eschrichtius rebus*'tus). 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 zaitisa (*Erignathus barbatus*) (Biology of the bearded seal (*Erignathus barbatus*)). Izv. Tr. Akad. Nauk SSSR, Inst. Okeanogr. **71:223-225**. In Russian. (Transl. by Fish. Mar. Serv., Ste. Anne de Bellevue, Quebec, Can., Transl. Ser. 3774, 1976, 4 p.)

From the end of September to October 1958, 54 seals taken from the Kara Sea were examined. The predominant food items were crustaceans, "*Mesidothea sabini*, *Crangon* spp., and gameriid 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. **Unpubl. manuscr.**, U. S. Fish **Wildl.** Serv., Seattle, Washington, 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 comprised by commercial species. 50 fig., 30 tables, 9 appendices.

Thomas, Rex, and V. B. Scheffer.

1962. Records of ringed seals from the **Pribilof** Islands. **J. Mammal.** **43(3):428.**

On 21 June 1961, a *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. **MSC. 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 pretiosus*) comprised the bulk of the food of the Alaskan baleen whales. Sperm whales principally took squid, octopus and fish.

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.** **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 Lat. 58°53'N, Long. 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.

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). Izd. "Pishch. Prom.", Moscow. In Russian. (Transl. by Israel Program Sci. Transl., 1968, in P. A. Moiseev (cd.), Soviet fisheries investigations in the northeast Pacific, Part III, p. 272-280; avail., U. S. Dep. Commer., Clearinghouse Fed. Sci. Tech. Inf., Springfield, Virginia, as TT 67-51205.

The Bering Sea, from Bristol Bay to the Bering Strait was surveyed for seals from 2 March to 1 July of 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 (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 the distribution. The mechanism of reproduction is similar in all seal species, but maternal behavior is varied. For seal lions, parturition occurs in mid-June on coastal ground. Stomach dissections suggest herring is a staple food item at this time. Walrus 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 promysle 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). In Russian." (Transl. by Israel Program Sci. Transl., 1968, in P. A. Moiseev (cd.), Soviet fisheries investigations in the northeast Pacific, Part 3, p. 281-285. Avail., U. S. Dep. Commer., Natl. Tech. Inf. Serv., Springfield, Virginia, as TT 67-51205,)

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 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, Transl. Ser. 1889, 1971, 19 p.)

Data was collected from 1287 ringed, ribbon, harbor and bearded seals in the Okhotsk and Bering Seas in 1959-1962. Information on the 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. Opređenje vidov dal'nevostochnykh tyulenei s samoleta (Identifying the species of Far Eastern seals from an airplane) . Izv. Tikhookean. Nauchno-issled. Inst. Rybn. Kho Z . Okeanogr. 58:163-172. In Russian. (Transl. by U. S. Dep. Int., Bur. Commer. Fish., Seattle, Washington, 1966 in K. I. Panin (cd.), Soviet research on marine mammals of the Far East, p. 87-97.)

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 figs.

1968. Rest tela i razvitie organov razmnozheniya severotikhookeanskikh nastoyashchikh tyulenei (Body growth and development of reproductive organs of the North Pacific phocids). Izd. "Pishch. Prom.", Moscow. In Russian. (Transl. , Isreal Program Sci. Transl. , 1971, in V. A. Arsen'ev and K. I, Panin (eds.), Pinnipeds of the North Pacific, p. 213-241; avail., U. S. Dep. Commer. , Natl. Tech. Inf. Serv., Springfield, Virginia, 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.

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.* 58:159-162. In" Russian. (Transl. by Dep. Int., Bur. Commer. Fish., Seattle, Washington, 1966, in K. I. Panin (cd.), Soviet research on marine mammals of the Far East, p. 83-86.)

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 reclaimed. A figure shows movement 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 promysia iastonogikh v Beringovom more (Prospects for commercial sealing in the Bering Sea). *Rybn. Khoz.* 42(9):25-28. In Russian. (Transl. by U. S. Dep. Int., Bur. Commer. Fish., Seattle, Washington 6 p.)

Data was collected from 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.

Tomilin, A. G.

1957. *Kitoobraznye* (Cetaceans) . Vol. IX. **Zveri** vostochnoi **Europy** i severnoi Azii (Mammals of eastern Europe and adjacent countries) . *Izd. Akad. Nauk SSSR, Moskva*, 756 p. In Russian. (Transl. by **Isreal** Program Sci. Transl. , 1967, 717 p., avail. U. S. Dep. Comber. , **Natl. Tech. Inf. Serv.**, Springfield, Virginia.)

Encyclopedic account of species, including: nomenclature, external appearance, geographical distribution and migrations, biology, and whaling industry. Includes abundant citations from literature, author's recorded observations, plus information gleaned from natives of coastal areas (e.g., Siberian coast). Stomach contents are given for specific regions when known. There is no comprehensive bibliography. Illustrations and photos.

Townsend, C. H.

1916. Porpoises at sea. N. Y. **Zool. Soc. Bull.** 19(6):
1427-1428, 2 photos.

Swimming speed -- remora attached -- baby swimming with mother. **Two** good photos. No species named, though one is certainly Phocoenoides in Alaska.

1935. The distribution of certain whales as shown by log-book records of American whaleships. **Zoologica** 19(1):
3-50.

Compilation of the records from 744 vessels and 1,665 voyages carried out from 1785-1916. 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 **bow**-head whales and only occurred during the summer months. Maps included with seasonal catches.

Uda, M.

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 was 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. It appears the mixing boundaries between cold water and warm water masses correspond to the centers of the most favorable whaling grounds. The currents off Japan and the **Kurile** Islands are examined with greater 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 discussed. Good whaling found where water masses of different temperatures meet, and in foggy conditions.

Vania, John, and Edward. Klinkhart.

1967. Marine mammal report. Vol. VIII, Annual Project Segment Report, Fed. Aid Wildl. Restoration, Alaska Dep. Fish Game, Juneau, Alaska, 24 p.

1. "Sea lions" - Calendar year 1966. Reproductive tracts of 11 adult female **Steller** sea lions collected in October were examined. Implantation is delayed for 3 months. **Pelage** of pups collected in June, July and October was examined to determine their molting season, with regard to commercial use of skins. Molt at Lat. 58° - 59°N lasts from the last week in July until beyond 25 October. Total harvest was 3,907, from 3 islands: **Sugarloaf**, Marmot and Akutan.

2. "Sea otter" - Calendar year 1966. Thirty otters were transplanted from Prince William Sound to **Klag** Bay (south-east Alaska) and Yakutat Bay. Breeding success of the transplanted animals has not been **confirmed**. 2 fig.

3. "Hair seals" - Calendar year 1966. Reports on studies of harbor seals at Tugidak Island and the Port Heiden - Port **Moller** area. Three hundred pups were tagged on **Tugidak** Island; 45 were recovered. Total **harvest** information was taken from bounty records. Aerial surveys were carried out of Tugidak Island, Port Heiden - Port **Moller**, Sitkinak Island, Seal Island, and Cinder River.

4. "**Beluga** whales" - Calendar year 1966. Killer whale sounds in the 20-20,000 cps frequency range were transmitted underwater in the Naknek River (Bristol Bay) and **beluga** whales moved away from the sound source. Four **belugas** were collected in the **Kvichak** River and measurements and stomach contents are given.

Vania, John, Edward **Klinkhart**, and Karl Schneider.

1968. Marine mammal report. Vol. IX, Annual Project Segment Report, Fed. Aid Wildl. Restoration, Alaska Dep. Fish Game, Juneau, Alaska, 46 p.

1. "Sea lions" - Calendar year 1967. Harvesting activities were monitored on **Sugarloaf** Island and Marmot Island where hunters took 4,855 sea lion pup pelts. Hunting activity caused a shift of several thousand sea lions from one area of the rookery to another.

2. "Sea otter" - Calendar year 1967. Sightings of transplanted otters near Klag Bay are reported. Experimental harvests of 300 from Adak Island, and 205 from **Amchitka** Island were made by Department personnel and sold with ca. 500 pelts from previous experimental harvests in 1962-63. External measurements for 1967 animals are tabulated, with dates and locations of collection.

(cont.)

3. "Harbor seals" - Examination of **pelage** specimens collected at 2-week intervals during 1966-67 indicated that molt begins in late August and is completed by late October. At Tugidak Island (June 2-21) 1,106 pups were tagged; 180 were tagged at Port Heiden (June 14-28). Pupping areas on Tugidak Island, Port Heiden and Port Moller were surveyed by air during June, July and August.
4. "**Beluga** whales" - Calendar year 1967. From 4 May to 13 May continuous broadcasts of killer whale noises were made underwater in the Naknek River, Bristol Bay. From 25 May to 15 June intermittent broadcasts of killer whale noises were made in the Kvichak River. **Beluga** whales changed their previously observed daily movements to avoid the area of the transmitter. They responded at a distance of about one mile.

Wada, S.

1975. Indices of abundance of large-sized whales in the North Pacific in 1973 whaling season. Rep. **Int. Comm. Whaling 25:129-165.**

Indices of abundance are calculated using (1) catch and effort data from Japanese whaling in North Pacific, 1966-1973, and (2) whale sightings by scouting vessels in North Pacific 1965-1973. In addition to indices, raw data are tabulated by species for catch and sightings.

The Whale 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 recaptured. The North Pacific was broken into 13 areas extending from the Bering Strait to 10°N. Figures 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 and in the Chukchi Sea, Bering Sea and Gulf of Alaska. Includes thoughts on route of migration 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. Management 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 N. Amer. **Wildl. Conf.**, p. 430-440.

Reviews **history** of pelagic studies of the northern fur seal. Summarizes U. S. pelagic research 1947-1952; animals were collected from south of the **Pribilof** Islands on both sides of the Aleutian Islands. Includes some findings of the joint research project carried out in the spring of 1952 by Canada, US and Japan. Upon leaving the **Pribilofs**, those seals bound for the North American coast fan out southward and eastward into the eastern North Pacific and Gulf of Alaska. Migration differs in the winter distribution of various age classes; notes sites of winter concentrations.

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, Washington, 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. Water temperature was recorded. Stomach contents are reported.

Wolman, A. A.

1972. Humpback whale. In A. Seed (ed.), Baleen whales in eastern North Pacific and Arctic waters, p. 38-43. Pacific Search Books, Seattle, Washington.

A general article that touches on the morphology and life history of Megaptera **novaengliae**. 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 the feeding grounds. Primarily, they feed on **euphausiids**, but are known to take anchovies occasionally. Estimates fewer than 2,000 humpback whales exist in the North Pacific.

Zenkovich, B. A.

1971. Uchast' kitov (Whale areas). *Izv. Atlant. Nauchno-issled. Inst. Rybn. Khoz. Okeanogr.* 39:7-27. In Russian. (Transl. by Dep. Environ. , Fish. Mar. Serv., Arctic Biol. Sta. , Ste. Anne de Bellevue, Quebec, Can. , Transl. Ser. 3185, 1974, in K. K. Chapskii (cd.), Research on Marine Mammals, 41 p.)

The world oceans are divided into 4 areas: North Pacific, North Atlantic, Antarctic and Southern Hemisphere. The article provides catch statistics on the blue, fin, hump-back, sei, sperm and grey whales from 1900-1967, in each area. Anecdotal information offered on external parasites as they occur in different waters. A plea is made for stringent quotas in all 4 areas on the three commercial species (fin, sei sperm).

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INDEXSPECIES -**CARNIVORA** (Pinnipeds, sea otter)

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 Peterson, R. S., B. J. LeBoeuf, et al., 1968
 Pike, G. C., and I. B. **MacAskie**, 1966, 1967, 1968
 Pike, G. C., I. B. **MacAskie**, et al., 1965, 1966
 Pike, G. C., **Spalding, MacAskie**, and Craig, 1959,
 1960, 1961, 1962, 1963
 Pike, G. C., **Spalding, MacAskie**, and **Velsen**, 1958
Prasil, R. G., 1972
Roppel, A. Y., and S. P. Davey, 1965
Roppel, A. Y., Johnson, Anas, et al., 1965, 1966
Roppel, A. Y., Johnson, **Bauer**, et al., 1963
Roppel, A. Y., Johnson, and Chapman, 1965
 Scheffer, V. B., 1973
Schiller, E. L., and R. Rausch, 1956
Spalding, D. A., 1964
 Taylor, F. H. C., et al., **1955**
Wilke, F., and K. W. Kenyon, 1952, 1954
Wilke, F., and K. **Niggol**, et al., 1958

Northern sea lion
 (Eumetopias jubatus):

Barr, L., 1975
Carlson, H. R., 1975
 Daetz, G. M., 1959
Fiscus, C. H., and G. A. Baines, 1966
Fiscus, C. H., and V. B. Scheffer, 1962
Imler, R. H., and H. R. Sarber, 1947
 Kenyon, K. W., 1952, 1962a, 1965
 Kenyon, K. W., and D. W. Rice, 1961
 Mathisen, O. A., 1959
 Mathisen, O. A., R. T. Baade, et al., 1962
 Mathisen, and R. J. Lopp, 1963
 Murie, O. J., 1959
 Osgood, W. H., E. A. **Preble**, et al., 1915
 Panina, G. K., 1966a
 Peterson, R. S., and B. J. LeBoeuf, 1969
 Pike, G. C., 1961
 Pike, G. C., and B. E. Maxwell, 1958
 Pitcher, K. W., 1975
Prasil, R. G., 1972
 Sandegren, F., 1975
Scammon, C. N., 1871
 Scheffer, V. B., **1945**, 1973
Schiller, E. L., and R. **Rausch**, 1956
Spalding, D. J., 1964

Tikhomirov, E. A., 1959, 1964a, **1964b**
 Tikhomirov, E. A., and G. M. Kosygin, **1966b**
 Vania, J., and E. Klinkhart, **1967**
 Vania, J., and E. Klinkhart, et al., 1968
 Wilke, F., and K. W. Kenyon, 1952

Ribbon seal
 (Phoca fasciata):

Bee, J. W., and E. R. Hall, 1956
 Burns, J. J., **1970**, 1973
 Fedoseev, G. A., 1973, 1976
 Gill, T., 1873
 Johnson, M. L., C. H. Fiscus, et al., 1966
 Kenyon, K. W., **1962b**
 Kosygin, G. M., **1966b**, **1966c**
 Popov, L. A., 1976
 Shustov, A. P., **1965a**, **1965b**, **1965c**, **1965d**, 1967,
 1969, 1972
 Tikhomirov, E. A., 1964a, 1966a, **1966b**, 1968
 Tikhomirov, E. A., and G. M. Kosygin, 1966a, **1966b**

Ringed seal
 (Phoca hispida):

Bailey, A. M., and R. W. Hendee, 1926
 Bee, J. W., and E. R. Hall, 1952
 Burns, J. J., 1970, 1973
 Burns, J. J., and S. J. Harbo, Jr., 1972
 Fedoseev, G. A., 1975, 1976
 Fedoseev, G. A., and Y. I. Nazarenko, 1970
 Fedoseev, G. A., and G. G. Shmakova, 1976
 Foote, D. C., 1965
 Johnson, M. L., C. H. Fiscus, et al., 1966
 Kenyon, K. W., **1960b**, **1962b**
 Pikharev, G. A., 1946
 Popov, L. A., 1976
 Potelov, V. A., 1975
 Saario, D. J., and B. Kessel, 1966
 Shustov, A. P., 1972
 Thomas, R., and V. B. Scheffer, 1962
 Tikhomirov, E. A., 1966a, **1966b**, 1968

Sea otter
 (Enhydra lutris):

Barabash-Nikiforov, I., 1935
 Burns, J. J., and L. W. Croxton, 1963
 Calkins, D., and P. C. Lent, 1975
 Hanna, G. D., 1923
 Johnson, M. L., and G. D. Alcorn, 1962
 Johnson, M. L., and K. W. Kenyon, et al., 1967
 Kenyon, K. W., **1961b**, 1965
 Lensink, C. J., 1960

Murie, O. J., 1959
Nikolaev, A. M., 1960, 1961, 1965, 1971
 Osgood, W. H., et al., 1915
 Pitcher, K. W., 1975
Prasil, R. G., 1972
Scammon, C. N., 1870
 Scheffer, V. B., 1973
 Scheffer, V. B., and F. Wilke, 1950
 Schneider, K. B., and J. B. Fare, 1975
 Sherrod, S. K., et al., 1975
 Vania, J., and E. **Klinkhart**, 1967

Walrus

(*Odobenus rosmarus* divergent):

Bailey, A. M., and R. W. Hendee, 1926
 Branson, J. H., 1968
 Brooks, J. W., 1954
 Burns, J. J., 1965a, **1965b, 1965c**, 1966, **1967b**, 1970
 Burns, J. J., and L. W. Croxton, 1963
 Fay, F. H., 1952, 1953, **1954, 1955, 1957**, 1958, 1960,
1975b
 Fedoseev, G. A., 1962, 1966, 1976
 Foote, D. C., 1965
Gol'tsev, V. N., 1968, 1972
 Hanna, G. D., 1920, 1923
 Johnson, M. L., C. H. **Fiscus**, et al., 1966
Kenyon, K. W., 1960a, **1960c, 1965**
Krylov, V. I., 1966, 1968
Nikulin, P. G., 1941, 1947
 Scheffer, V. B., 1973
 Shustov, A. P., 1972
 Tikhomirov, E. A., 1964a

CETACEANS (Whales, dolphins, porpoises)

Beluga or White Whale

(*Delphinapterus leucas*):

Bee, J. W., and E. R. **Hall**, 1956
 Brooks, J. W., 1957
 Fedoseev, G. A., 1966
 Foote, D. C., 1965
 Johnson, M. L., C. H. **Fiscus**, et al., 1966
 Kellogg, R., 1931
 Kleinenberg, S. E., et al., 1964
Klinkhart, E., 1966
 Saario, D. J., and B. **Kessel**, 1966
 Scheffer, V. B., 1973
 Sergeant, D. E., and P. F. Brodie, 1969, **1975**
 Sergeant, D. E., and W. Hock, 1974
Sleptsov, M. M., 1961a
 Smith, T. G., 1974

Blue whale

(Balaenoptera musculus):

Allen, K. Radway, 1974
 Doi, T., et al., 1967
 Hanna, G. D., 1920
Ivashin, M. V., and A. A. Rovnin, 1967
 Kawakami, T., and T. Ichihara, 1958
 Kellogg, R., 1931
 Murie, O. J., 1959
 Nasu, K., 1963, 1966
 Nemoto, T., 1957, 1959
 Nemoto, T., and T. Kasuya, 1965
 Nishiwaki, M., 1966
 Ohsumi S., and Y. Shimadzu, et al., 1971
Omura, H., and S. Ohsumi, 1964, 1974
 Rice, D. W., 1974b
Ruud, J. D., 1956
Sakiura, H., et al., 1953
Scheffer, V. B., 1973
Sleptsov, M. M., 1955, 1961a
 Thompson, R. J., 1940
 Uda, M., and K. Nasu, 1956
 Whale Research Institute, 1967
Zenkovich, B. A., 1971

Bowhead whale

(Balaena mysticetus):

Bailey, A. M., and R. W. Hendee, 1926
Berzin, A. A., and A. A. Kuz'min, 1975
 Fedoseev, G. A., 1966
Fiscus, C. H., and W. M. Marquette, 1975
 Foote, D. C., 1965
 Hanna, G. D., 1920
 Johnson, M. L., C. H. Fiscus, et al., 1966
 Kellogg, R., 1931
 Maher, W. J., and N. J. Wilimovsky, 1963
Nemoto, T., 1959
 Ray, P. H., 1885
 Rice, D. W., 1974b
Saario, D. J., and B. Kessel, 1966
 Sergeant, D. E., and W. Hock, 1974
Sleptsov, M. M., 1961a
 Smith, T. G., 1974
 Townsend, C. H., 1935

Dan porpoise

(Phocoenoides dallii):

Cowan, I. M., 1944
Mizue, K., and K. Yoshida, 1965
Mizue, K., K. Yoshida, et al., 1966

Murie, O. J., 1959
 Nichols, J. T., 1950
Ohsumi, S., 1975
 Scheffer, V. B., 1946, **1949b**, 1950a, 1953a, 1973
Sleptsov, M. M., 1961a
 Townsend, C. H., 1916

False killer whale
(Pseudorca crassidens):

Kasuya, T., 1971

Fin whale
(Balaenoptera physalus):

Allen, K. Radway, 1974
 Andrews, R. C., 1909
 Doi, T., et al., 1967
Fujino, K., 1954, 1960
Gulland, J. A., 1974
 Howell, A. B., and L. M. Huey, 1930
Ivashin, M. V., and A. A. Rovnin, 1967
 Kawakami, T., and T. Ichihara, 1958
 Kellogg, R., 1931
Murie, O. J., 1959
 Nasu, K., 1960, 1963, 1966
 Nemoto, T., 1957, 1959, 1963
 Nemoto, T., and **T. Kasuya, 1965**
 Nishiwaki, M., 1966
 Ohsumi, S., M. Nishiwaki, et al., 1958
Ohsumi, S., Y. Shimadzu, et al., 1971
Omura, H., and S. Ohsumi, 1964, 1974
 Rice, D. W., **1974b**
 Sakiura, H., et al., 1953
 Scheffer, V. B., 1973
Shurunov, N. A., 1970
Sleptsov, M. M., 1955, 1961a, 1961b
 Thompson, R. J., 1940
 Uda, M., and K. Nasu, 1956
 Whale Research Institute, 1967
Zenkovich, B. A., 1971

Goosebeak whale
(Ziphius cavirostris)

Balcomb, K. C., 1973
 Cowan, I. M., 1945
 Cowan, I. M., and C. J. Guiguet, 1952
 Cowan, I. M., and J. Hatter, 1940
 Fiscus, C. H., D. W. Rice, et al., 1969
 Kenyon, K. W., 1961a
 Mitchell, E., 1968

Roest, A. I., et al., 1953
 Scheffer, V. B., 1949a
Sleptsov, M. M., 1961b

Gray grampus or **Whitehead**
 (Grampus griseus):

Guiguet, C. J., and G. C. Pike, 1965
Hatler, D. F., 1971
Kasuya, T., 1971
 Orr, R. T., 1965

Gray whale
 (Eschrichtius robustus):

Allen, K. Radway, 1974
 Arsen'ev, V. A., et al., 1973
 Bailey, A. M., and R. W. Hendee, 1926
 Bee, J. W., and E. R. **Hall, 1956**
Berzin, A. A., and A. A. Kuz'min, 1975
Fedoseev, G. A., 1966
Gilmore, R. M., 1959
 Hatler, D. F., and J. D. Darling, 1974
 Howell, A. B., and L. M. **Huey, 1930**
Ichihara, T., 1958
 Kellogg, R., 1931
 Maher, W. J., 1960
 Nasu, K., 1960
Nemoto, T., 1959
 Nichols, G., Jr., 1975
 Pike, G. C., 1962
Ramsey, D. H., 1968
 Rasmussen, R. A., and N. E. Head, 1965
 Rice, D. W., 1965, 1974a, **1974b, 1975**
 Rice, D. W., and A. A. **Wolman, 1969, 1971**
 Scheffer, V. B., 1973
 Shurunov, N. A., 1970
Sleptsov, M. M., 1961a
Sund, P. N., 1975
 Sund, P. N., and J. L. O'Connor, 1974
 Tarasevich, M. N., 1963
 Townsend, C. H., 1935
Wilke, F., and C. H. Fiscus, 1961
 Zenkovich, B. A., 1971

Harbo-r porpoise
 (Phocoena phocoena):

Bailey, A. M., and R. W. Hendee, 1926
 Bee, J. W., and E. R. Hall, 1956
 Gaskin, D. W., et al., 1974
 Hall, E. R., and J. W. Bee, 1954
Hanna, G. D., 1923

Murie, O. J., 1959
Ohsumi, S., 1975
 Scheffer, V. B., 1953a, 1973
Sleptsov, M. M., 1961a, **1961b**
Wilke, F., and K. W. Kenyon, 1952

Humpback whale

(Megaptera novaeangliae):

Allen, K. Radway, 1974
 Andrews, R. C., **1909**
 Doi, T., et al., 1967
Gulland, J. A., 1974
Hanna, G. D., 1920
 Howell, H. B., and L. M. Huey, 1930
Ivashin, M. V., and A. A. **Rovnin**, 1967
Kawakami, T., and T. **Ichihara**, 1958
 Kellogg, R., **1931**
Murie, O. J., 1959
 Nasu, K., 1963, 1966
 Nemoto, T., 1957, 1959
 Nishiwaki, M., 1966
Ohsumi, S., Y. Shimadzu, et al., 1971
Omura, H., and S. **Ohsumi**, 1964
 Rice, D. W., **1974b**
 Sakiura, H., et al., 1953
Scheffer, V. B., 1973
 Sleptsov, M. M., 1955, 1961a
 Thompson, R. J., 1940
 Townsend, C. H., 1935
 Uda, M., and K. Nasu, 1956
 Whale Research Institute, 1967
Wolman, A. A., 1972
Zenkovich, B. A., 1971

Killer whale

(Orcinus orca):

Baldrige, A., 1972
 Barr, N., and L. Barr, 1972
 Bee, J. W., and E. R. Hall, 1956
 Branson, J. H., **1971**
 Hanna, G. D., 1920, 1923
Ivanova, E. I., 1961
Kasuya, T., **1971**
Kenyon, K. W., 1965
Murie, O. J., 1959
 Rice, D. W., 1968
Scammon, C. N., 1872
 Scheffer, V. B., 1973
Sleptsov, M. M., 1961a

Minke whale

(Balaenoptera acutorostrata):

- Doroshenko, N. V., et al., 1974
 Kellogg, R., 1931
Kenyon, K. W., 1965
Nemoto, T., 1959
 Rice, D. W., **1974b**
 Scattergood, L. W., 1949
Scheffer, V. B., 1973
Sleptsov, M. M., 1961a

Narwhal

(Monodon monoceros):

- Bee, J. W., and E. R. Hall, 1956
Bruemmer, F., 1969
 Geist, O. W., et al., 1960
 Huey, L. M., 1952
Sleptsov, M. M., 1961a

North Pacific giant bottlenose whale

(Berardius bairdii):

- Hanna, G. D., **1920, 1923**
Kasuya, T., 1971
 Kellogg, R., 1931
Ohsumi, S., 1975
 Pike, G. C., 1953
 Rice, D. W., **1974b**
 Scheffer, V. B., 1949a
Sleptsov, M. M., 1961a, 1961b
 Slipp, J. W., and F. Wilke, 1953

Northern right-whale dolphin

(Lissodelphis borealis):

- Kasuya, T., 1971**

Pacific whiteside dolphin

(Lagenorhynchus obliquidens):

- Cowan, I. M., and C. J. Guiguet, 1952
Houck, W. J., 1961
 Pike, G. C., 1960
 Scheffer, V. B., **1950b, 1953a**

Right whale

(Balaena glacialis):

- Allen, K. Radway, 1974
Berzin, A. A., and A. A. Kuz'min, 1975
Gilmore, R. M., 1956
Ivashin, M. V., and A. A. Rovnin, 1967
 Kellogg, R., 1931

Klumov, S. K., 1962
Nasu, K., 1960
 Nemoto, T., 1959
 Nemoto, T., and T. **Kasuya, 1965**
Ohsumi, S., Y. Shimadzu, et al., 1971
 Omura, H., 1958
 Omura, H., S. **Ohsumi, et al., 1969**
 Rice, D. W., **1974b**
 Scheffer, V. B., 1973
Sleptsov, M. M., 1955
 Townsend, C. H., 1935

Sabertooth or Bering Sea beaked whale
 (**Mesoplodon stejnegeri**):

Fiscus, C. H., D. W. Rice, et al., 1969
 Moore, J. C., 1963, 1966
 Scheffer, V. B., 1949a
Sleptsov, M. M., 1961b

Sei whale
 (**Balaenoptera borealis**):

Doi, T., et al., 1967
 Gill, C. D., and S. E. Hughes, 1971
Gulland, J. A., 1974
 Ivashin, M. V., and A. A. **Rovnin, 1967**
 Kawakami, T., and T. **Ichihara, 1958**
 Kellogg, R., 1931
Machida, S., 1970
Murie, O. J., 1959
Nasu, K., 1963, 1966
 Nemoto, T., 1957, 1959, 1963
 Nemoto, T., and T. **Kasuya, 1965**
 Nishiwaki, M., 1966
Ohsumi, S., and Y. Fukuda, 1975
Ohsumi, S., Y. Shimadzu, et al., 1971
 Omura, H., and S. **Ohsumi, 1964, 1974**
 Rice, D. W., **1974b**
 Sakiura, H., et al., 1953
 Scheffer, V. B., 1973
Shurunov, N. A., 1970
Sleptsov, M. M., 1955, 1961a
 Thompson, R. J., 1940
 Uda, M., and K. **Nasu, 1956**
 Whale Research Institute, 1967
 Zenkovich, B. A., 1971

Shortfin pilot whale
 (**Globicephala macrorhynchus**):

Kasuya, T., 1971
Ohsumi, S., 1975
Sleptsov, M. M., 1961b

Sperm whale

(Physeter macrocephalus):

- Allen, K. Radway, 1974
Berzin, A. A. 1959, 1964a, **1964b**, 1970
Caldwell, D. K., et al., 1966
 Doi, T., et al., 1967
Gulland, J. A., 1974
Ivashin, M. V., and A. A. **Rovnin**, 1967
Kasuya, T., 1971
 Kawakami, T., and T. **Ichihara**, 1958
 Kellogg, R., 1931
Murie, .O. J., 1959
 Nasu, K., 1963
Nemoto, T., and K. **Nasu**, 1963
 Nishiwaki, M., 1962, 1966
 Nishiwaki, M., et al., 1956
 Ohsumi, S., Y. **Shimadzu**, et al., 1971
 Okutani, T., and T. **Nemoto**, 1964
Omura, H., and S. **Ohsumi**, 1964, 1974
 Rice, D. W., **1974b**
 Robbins, L. L., et al., **1937**
 Scheffer, V. B., 1973
Shurunov, N. A. 1970
Sleptsov, M. M., 1955
 Thompson, R. J., 1940
 Townsend, C. H., **1935**
 Uda, M., and K. Nasu, 1956
 Whale Research Institute, 1967
 Zenkovich, B. A., 1971

Striped dolphin

(Stenella coeruleoalba):

- Cowan, I. M., and C. J. **Guiguet**, 1952
Kasuya, T., 1971
Miyazaki, N., et al., 1973
 Scheffer, V. B., 1953a

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Great northern sea cow

(Hydrodamalis gigas):

- Berzin, et al.**, 1963

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- Abundance: Barr, L., 1975
 Bartholomew, G. A., and C. L. Hubbs, 1960
Borodin, R. G., and V. A. Aladimirov, 1975
 Burns, J. J., 1965b, 1966, 1967b, 1973
 Burns, J. J., and L. W. Croxton, 1963
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 Chapman, D. G., 1973
 Doi, T., et al., 1967
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 Fedoseev, G. A., 1962, 1966, 1973
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 Harry, G. Y., Jr., 1971
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Kenyon, K. W., 1960a, 1962a, 1965
Kenyon, K. W., and D. W. Rice, 1961
Klinkhart, E., 1966
Krylov, V. I., 1968
Kuzin, A. E., et al., 1973
 Lander, R. H., and H. Kajimura, 1976
 Lensink, C. H., 1960
 Mar. Mamm. Biol. Lab., 1972
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 Mathisen, O. A., 1959
 Mathisen, O. A., and R. J. Lopp, 1963
Nikolaev, A. M., 1961
 Nishiwaki, M., 1966
 Ohsumi, S., Y. Shimadzu, et al., 1971
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 Rice, D. W., 1965, 1974a, 1974b, 1975
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Sergeant, D. E., and P. F. Brodie, 1975
Sergeant, D. E., and W. Hock, 1974
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Sleptsov, M. M., 1961a
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Distribution:

Baker, R. C., et al., 1970
 Bee, J. W., and E. R. Hall, 1956
Berzin, A. A., and A. A. Rovnin, 1966
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 Brooks, J. W., 1954
 Brown, S. G., 1975
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Burns, J. J., and J. E. Morrow, 1973
Caldwell, D. K., et al., 1966
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 Clarke, R., 1957
 Cowan, I. M., 1945
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 Cowan, I. M., and J. Hatter, 1940
 Fay, F. H., 1952, 1954, 1955, **1975b**
 Fedoseev, G. A., 1962, 1966
Fiscus, C. H., 1972
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Fiscus, C. H., and H. Kajimura, 1965
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 Gaskin, D. W., et al., 1974
 Geist, O. W., et al., 1960
 Gill, T., 1873
 Gilmore, R. M., 1956, 1959
Gol'tsev, V. N., 1968, 1972
 Gudkov, V. M., 1962
 Guignet, C. J., and G. C. Pike, 1965
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 Hall, E. R., and J. W. Bee, 1954
Hatler, D. F., 1971
Hatler, D. F., and J. D. Darling, 1974
 Huey, L. M., 1952
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 Nichols, J. T., 1950
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 Pike, G. C., 1953, 1962
 Pike, G. C., and B. E. Maxwell, 1958
 Pitcher, K. W., 1975
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 Rice, D. W., and A. A. **Wolman, 1971**
 Robbins, L. L., et al., 1937
 Saario, D. J., and B. **Kessel, 1966**
Scammon, C. N., 1870, 1872, 1874
Scattergood, L. W., 1949
 Scheffer, V. B., 1946, 1949a, **1949b, 1950a, 1950b .**
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 Sergeant, D. E., and W. Hock, 1974
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Slipp, J. W., and F. Wilke, 1953
Spalding, D. J., 1964
 Taylor, F. H. C., et al., 1955
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 Tikhomirov, E. A. , 1964a, **1966b, 1968**
 Tikhomirov, E. A., and G. M. **Kosygin, 1966b**
Tomilin, A. G., 1957
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 Uda, M., 1954
 Uda, M., and K. **Nasu, 1956**
Wada, S., 1975
 Whale Research Institute' 1967
Wilke, F., and C. H. Fiscus, 1961

Wilke, F., and K. W. Kenyon, 1954
 Wilke, F., K. Niggol, et al., 1958
 Wolman, A. A., 1972

Food and Feeding:

Andrews, R. C., 1909
 Baldridge, A., 1972
 Barr, N., and L. Barr, 1972
 Berzin, A. A., 1959
 Brooks, J. W., 1954
 Burns, J. J., 1965b
 Cowan, I. M., 1944
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PAGE	REPLACE :	WITH :
15	Borodin & Vladimirov 1975, citation, line 5,6	Natl. Oceanic Atmos. Admin. , Serv. Div. , Washington, D. C.)
		Natl. Oceanic Atmos. Admin., Natl. Mar. Fish. Serv., Office Int. Fish., Language Serv. Div. , Washington, D. C.
29	Fay 1974a, citation, line 2	D. W. Wood
		D. W. Hood
31	Fedoseev & Nazarenko 1970, citation, line 3	introspective
		intraspecific
33	Fiscus, Braham et al. 1976, citation, line 3	D. W. Withrow
		D. E. Withrow
33	Fiscus & Kajimura 1965, citation, line 1	Hisoshi
		Hiroshi
33	Fiscus & Marquette 1975, annotation, line 3	Saboonga
		Savoonga
54	Marine Mammal Biological Laboratory 1970b and 1971a, citations (same error in both)	U. S. Natl. Mar. Fish. Serv.
		u. s. Dep. Commer. , Natl. Mar. Fish Serv.
55	Marine Mammal Biological Laboratory 1971b, 1972, and 1973, citations (same error in all)	US Fish Wildl. Serv., Bur. Commer. Fish.
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		(The 1973 item is misplaced. It belongs under "Marine Mammal Division".)
5a	Mizue & Yoshida 1965, annotation	ADD : West of 175°W, eleven Japanese salmon fleets caught more than 10,000 porpoises (<i>Phocoenoides dalli</i>) 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.
65	Nikulin 1947, citation, line 1	Bilolgicheskaya
		Biologicheskaya
68	Omura 1958, annotation	ADD : Exhaustive physical description is given of 2 right whales taken near Japan in 1956.
69	Orr 1965, year of publication	1965
		1966
71	Panina 1971, citation, line 3	Yoponskom
		Yaponskom
77	Prasil, citation, line 2 and line 4	1972
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		Proc. 22nd Sci. Conf. 8 p.
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(continued)

77	Prasil, citation	
	ADD TO CITATION: (Additional material on this presentation has been consulted, and is available at the Marine Mammal Division, Natl. Mar. Fish. Serv., Seattle, Washington.)	
80	Robbins et al. 1937, citation, line 1	
	Olhdam	Oldham
81	Rudd 1956, citation, line 1	
	Rudd	Ruud
81	Saario & Kessel 1966, citation, line 1	
	Brian	Brina
89	Shurunov 1970, citation line 4, and annotation line 1	
	ikeana	okeana
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90	Shustov 1965d, citation, lines 6,7	
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91	Shustov 1969, citation, line 2 and line 7	
	severo-zapadno; Ser. 1510, 1970.)	severo-zapadnoi Ser. 1510, 1970, summary only.)
92	Sleptsov 1955, citation, line 2	
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96	Tikhomirov 1964a, annotation, line 8	
	the distribution.	explain the distribution.
98	Tikhomirov & Kosygin 1966b, citation, line 1	
	promysia iastonogikh	promysla lastonogikh

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- 104 Beaufort Sea
ADD : Huey, L. M., 1952
- 105 Chukchi Sea
DELETE : Huey, L. M. 1952