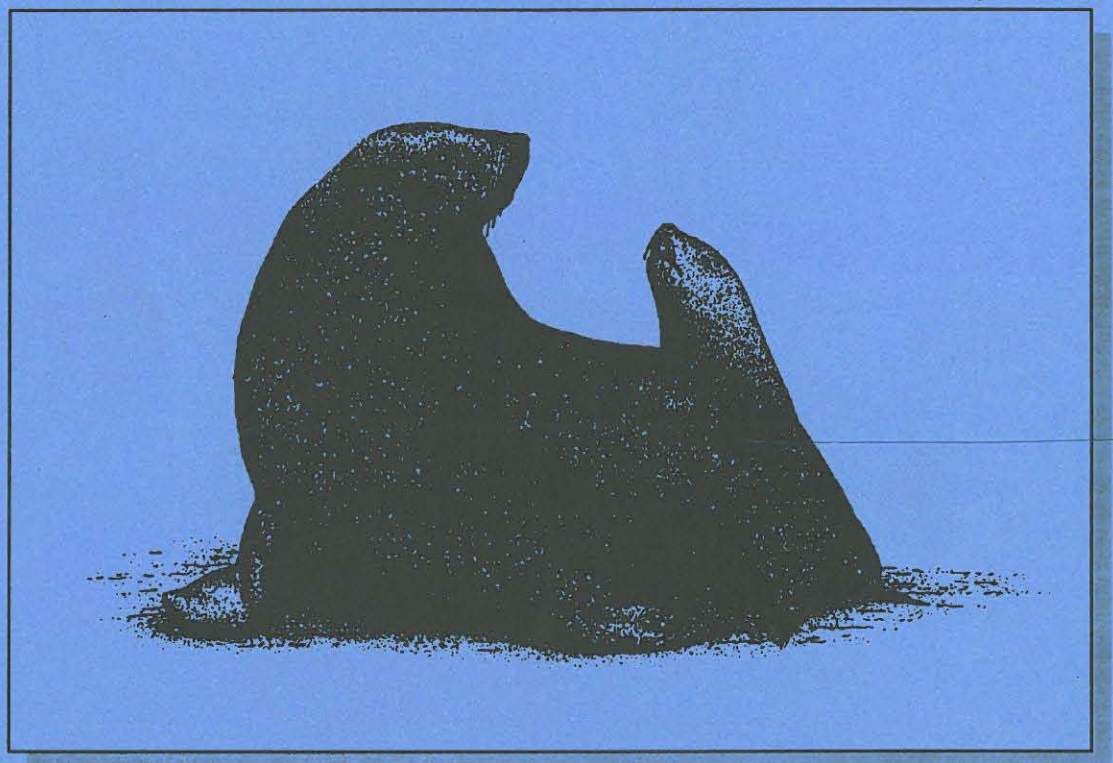
DEPARTMENT OF WILDLIFE

Washington

July 1993



STATUS OF THE STELLER (NORTHERN) SEA LION *(Eumetopias jubatus)* IN WASHINGTON

Washington
Department of Wildlife
Wildlife Management Division

The Washington Department of Wildlife maintains a list of endangered, threatened and sensitive species (Washington Administrative Codes 232-12-014 and 232-12-011, Appendix C). Species are evaluated for listing using a set of procedures developed by a group of citizens, interest groups, and state and federal agencies (Washington Administrative Code 232-12-297, Appendix C). The procedures were adopted by the Washington Wildlife Commission in 1990. They specify how species listing will be initiated, criteria for listing and delisting, public review, and recovery and management of listed species.

The first step in the process is to develop a preliminary species status report. The report includes a review of information relevant to the species' status in Washington including, but not limited to: historic, current, and future species population trends, natural history including ecological relationships, historic and current habitat trends, population demographics and their relationship to long term sustainability, and historic and current species management activities.

The procedures then provide for a 90-day public review opportunity for interested parties to submit new scientific data relevant to the status report and classification recommendation. During the 90-day review period, the Department holds one public meeting in each of its administrative regions. At the close of the review of the draft report, the Department completes a final status report and listing recommendation for presentation to the Washington Wildlife Commission. The final report, listing recommendation, and any State Environmental Policy Act findings are then released for public review 30 days prior to the Commission presentation.

This report is the Department of Wildlife's final Status Report and listing recommendation for the Steller (northern) sea lion. The listing proposal will be presented to the Washington Wildlife Commission on August 14, 1993 at the Colville Community Center, Colville, Washington. Comments on the report and recommendation may be sent to: Endangered Species Program Manager, Washington Department of Wildlife, 600 Capitol Way N, Olympia, WA 98501-1091; or presented to the Wildlife Commission at its August 14 meeting.

This report should be cited as:

Washington Department of Wildlife. 1993. Status of the Steller (northern) sea lion (*Eumotopias jubatus*) in Washington. Unpubl. Rep. Wash. Dept. Wildl., Olympia.

Status of the

Steller Sea Lion
(*Eumetopias jubatus*)

in Washington

July 1993

Washington Department of Wildlife
600 Capitol Way N
Olympia, WA 98501-1091

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ACKNOWLEDGMENTS

The summary and introduction to this document were prepared by Kelly McAllister, Endangered Species Recovery Biologist, Washington Department of Wildlife. The cover illustration was done by Darrell Pruett, Washington Department of Wildlife. The summary and introduction were improved after review by Barry Troutman, Scott Richardson, and Harriet Allen. The Department appreciates the interest shown and information provided by individuals who attended the public meetings or wrote letters concerning the status report and listing proposal.

EXECUTIVE SUMMARY

On 5 April 1990, the National Marine Fisheries Service published an emergency rule listing the Steller (northern) sea lion (*Eumetopias jubatus*) as a threatened species under provisions of the Endangered Species Act. Final listing for the species became effective on 4 December 1990. The listing action was deemed appropriate because of a major, rapid decline in sea lion numbers that had occurred throughout most of Alaska, within the core of the species' range. Counts of juveniles and adults in the region from the Kenai Peninsula to Kiska Island (i.e., the central and western Gulf of Alaska, and the eastern and Central Aleutian Islands) declined 63% between 1985 and 1989. In addition, counts from trend sites (rookeries and haulouts that have been counted during every major survey) between the late 1950's and 1990 showed an overall decline of 78%.

The reasons for the decline are not well understood. Changes in the quantity or quality of available prey may have contributed to the decline. Evidence of major shifts in the abundance of fish in the Bering Sea over the past several decades is well documented. Estimates of abundance of walleye pollock increased significantly in the late 1970's. This and other important sea lion prey support a major commercial fishery and millions of metric tons are removed by the fishery each year. The development and expansion of commercial fisheries throughout the sea lion's range may have caused detrimental changes in the food supply. However, the complexity of ecosystem interactions, and limitations of data and models make it difficult to determine how fishery removals may have influenced the population.

In the past, Steller sea lions have been harvested commercially and this may have contributed to decline over the past 30 years. A total of 45,178 pups were killed in the eastern Aleutian islands and Gulf of Alaska between 1963 and 1972. An experimental harvest in 1959 resulted in 616 adult males being taken. While this harvest may have been significant to some of the decline, it does not explain why numbers declined in areas that were not harvested or why declines in some areas were most pronounced 20 years after the harvest.

Sea lion losses incidental to commercial fisheries may also have contributed to the overall decline. The total estimated incidental catch of Steller sea lions in foreign and joint-venture trawl fisheries was over 20,000 animals for the period 1966-1988. A variety of other factors, including disease, contaminants, El Niño events (warmwater currents), and subsistence harvest by Alaska natives are considered either unimportant or too poorly understood to be considered meaningful to the observed decline.

In Washington, Steller sea lions are present year-round but are most abundant during fall and winter. They occur in greatest abundance along the outer coast from Cape Flattery to the mouth of the Columbia River. Some individuals also occur in inland waters such as Puget Sound. More than 1,000 animals of all age and sex classes have been counted during surveys in recent years. Although breeding sites for this species occur in British Columbia,

Oregon, and northern California, breeding was not documented in Washington until 1992 when a single pup was born on Carroll Island.

The National Marine Fisheries Service has listed the Steller sea lion as threatened throughout its range and Washington's Steller sea lions are part of the threatened population. Recovery actions are needed to correct the downward population trend and have been outlined in the federal recovery plan. The Steller sea lion is not considered in immediate danger of extirpation from Washington and is therefore not recommended for endangered status.

It is recommended that the Steller sea lion be designated as a threatened species in Washington.

INTRODUCTION

The Steller (northern) sea lion (*Eumetopias jubatus*) has suffered significant declines in the core populations of the Gulf of Alaska and the central and eastern Aleutian islands. Prompted by a petition and substantial data documenting the decline, the National Marine Fisheries Service emergency-listed the Steller sea lion as a threatened species under the Endangered Species Act on 5 April 1990. Final listing for the species became effective on 4 December 1990.

Rather than develop an independent report on the status of this species in Washington, the federal recovery plan for the species is included in Appendix A. The plan contains information on species description, life history, population status and trend, natural factors influencing the population, known and potential human impacts on the population, and actions needed for recovery. The final rule used by the National Marine Fisheries Service in its determination to list the Steller sea lion as a federally threatened species is included in Appendix B.

Steller sea lions are present in Washington year-round but are most abundant during fall and winter. More commonly found are California sea lions (*Zalophus californianus*), which have increased in recent years and are now often seen in many of Washington's marine areas. The National Marine Mammal Laboratory and the Department of Wildlife have been collecting data on distribution and abundance of Steller sea lions in Washington since the mid-1970's. More than 1,000 Steller sea lions of all age and sex classes have been counted in recent years on Washington's coast. They occur in greatest abundance on the outer coast from Cape Flattery to the mouth of the Columbia River. Fewer numbers are found in inland waters such as Puget Sound (Chumbley 1993).

Most sea lions utilize outer coast rocks, islands, and navigation buoys as haulouts (resting areas). Although breeding sites for this species occur in British Columbia, Oregon, and northern California, breeding in Washington was not documented in Washington until 1992 when a single pup was born on Carroll Island.

Washington's Steller sea lions are part of the threatened population listed by the National Marine Fisheries Service. The Steller sea lion is not considered in immediate danger of extirpation from Washington and is therefore not recommended for endangered status. In recognition of the federal listing status, the recent downward population trend, and the need for recovery actions to correct this trend, it is recommended that the Steller sea lion be designated as a threatened species in Washington.

REFERENCES CITED

Chumbley, K., editor 1993. 1991-92 Steller sea lions. Unpubl. Rep. Natl. Mar. Mammal Lab., Natl. Mar. Fish. Serv., Seattle, Wash. 13pp.

Appendix A

Recovery Plan for the Steller sea lion (*Eumetopias jubatus*)

RECOVERY PLAN

for the

STELLER SEA LION
(Eumetopias jubatus)

Prepared by the

STELLER SEA LION RECOVERY TEAM

for the

OFFICE OF PROTECTED RESOURCES
NATIONAL MARINE FISHERIES SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
SILVER SPRING, MARYLAND

December 1992

Approved:

William W. Fox, Jr.
Assistant Administrator for Fisheries

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Recovery plans delineate reasonable actions which are believed to be required to recover and/or protect the species. Plans are prepared by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, sometimes with the assistance of recovery teams, contractors, state agencies, and others. The Steller Sea Lion Recovery Plan was prepared by a recovery team and approved by the National Marine Fisheries Service. It does not necessarily represent official positions nor approvals of all the team members or cooperating agencies, other than the National Marine Fisheries Service, involved in the plan formulation. The plan represents the official position of the National Marine Fisheries Service only after it has been signed by the Assistant Administrator for Fisheries as approved. Approved recovery plans are subject to modification as dictated by new findings, changes in species status and completion of tasks described in the plan. Goals and objectives will be attained and funds expended contingent upon agency appropriations and priorities.

This final plan incorporates the new format that has become standard in recovery plans in recent years. It is intended to serve as a guide that delineates and schedules those actions believed necessary to restore the Steller sea lion as a viable self-sustaining element of its ecosystem. It is recognized that some of the tasks described in the plan are already underway. The inclusion of these ongoing tasks represents an awareness of their importance, and offers support for their continuation.

Literature Citation should read as follows:

National Marine Fisheries Service. 1992. Recovery Plan for the Steller Sea Lion (Eumetopias jubatus). Prepared by the Steller Sea Lion Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. 92 pp.

PREFACE

On April 5, 1990, the National Marine Fisheries Service (NMFS) published an emergency rule listing the Steller sea lion as a threatened species under provisions of the Endangered Species Act (ESA). This action resulted in part from a petition submitted by the Environmental Defense Fund, which requested that Steller sea lions be designated as an endangered species. A protective listing was deemed appropriate because of a major, rapid decline in sea lion numbers that had occurred throughout most of Alaska. The final listing, published on November 26, 1990, became effective on December 4, 1990.

Section 4(f) of the ESA requires that recovery plans be developed for endangered and threatened species unless the appropriate Secretary finds that such a plan will not promote conservation of the species. Each plan must incorporate: (1) a description of site-specific management actions that may be necessary to achieve goals for conservation and survival of the species; (2) objective measurable criteria that can be used to determine whether a species can be removed from a list; and (3) estimates of the time and costs for carrying out actions needed to achieve the plan's goal.

NMFS has determined that a recovery plan would promote the conservation of the Steller sea lion. This plan was written by the Steller Sea Lion Recovery Team at the request of the Assistant Administrator for Fisheries, NMFS. A preliminary draft Steller Sea Lion Recovery Plan was prepared by members of the Recovery Team and circulated to a select group of technical experts for review (see Acknowledgements). A revised Technical Draft was submitted to NMFS on February 20, 1991, and NMFS made this draft available for public review and comment. A final draft of the Steller Sea Lion Recovery Plan, which incorporated, to the maximum extent possible, all relevant comments received, was submitted by the Recovery Team to NMFS on October 3, 1991.

A Recovery Plan identifies the specific management actions that must be taken to ensure that the species of concern recovers to the point that it can be removed from ESA listing. Unlike the situation with many other species where the problems and necessary remedial actions can be clearly identified, the factors that have caused the decline in Steller sea lion abundance are poorly known. It has therefore been difficult to design and evaluate the probable effectiveness of potential management actions. The plan recommends continuation of ongoing research and development of new programs designed to improve our understanding of sea lion management needs. Although the amount of research being conducted on Steller sea lions is increasing, it may still be a long time before we will understand the role of all of the factors that may be influencing the population. Because of these uncertainties, the Recovery Team recognized as an immediate objective the need to identify actions that are most likely to stop the decline of the Steller sea lion population. Actions that are likely to have such an effect are given the highest priority in the Recovery Plan.

When it was possible to identify a specific management action that the Team thought likely to help stop the population decline or to enhance recovery of the Steller sea lion population, that action has been specifically recommended in the Recovery Plan. The Team also described a monitoring program that should be conducted in order to allow a continuing evaluation of the population trend and status of Steller sea lions. Results from research and monitoring programs will be considered in subsequent revisions and modifications to this Recovery Plan.

The goal of this Recovery Plan will be met when the Steller sea lion population has recovered to the extent that it can be removed from ESA listings. It is possible that at that point the species would still qualify for listing as depleted under terms of the MMPA, and it would therefore be necessary for a conservation plan to be in place. In that case, the Recovery Plan should be reviewed and revised as necessary to reflect MMPA requirements and the biological and ecological situations at that time.

MEMBERS OF THE STELLER SEA LION RECOVERY TEAM

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ACKNOWLEDGEMENTS

The Steller Sea Lion Recovery Team is appreciative of the assistance provided by Dr. Nancy Foster, Director, and Dr. Charles Karnella, Deputy Director, of the Office of Protected Resources, National Marine Fisheries Service (NMFS), and NMFS personnel who served as advisors to the Team: Jim Balsinger, Georgia Cranmore, Karl Gleaves, Sue Mello, Mike Payne and Dr. Steve Zimmerman.

The Recovery Team and NMFS would also like to to acknowledge and thank the following individuals and institutions for their review of the preliminary technical draft of the Steller Sea Lion Recovery Plan: David Ainley (Point Reyes Bird Observatory), Jay Barlow (NMFS, Southwest Fisheries Center), Robin Brown (Oregon Department of Fish and Wildlife), John Burns (Alaska Department of Fish and Game, retired), Mike Castellini (University of Alaska), Dan Costa (University of California at Santa Cruz), William Gilmartin (NMFS, Southwest Fisheries Center) Hans Hartman (University of Washington), Terry Haynes (Alaska Department of Fish and Game), Robert Hofman (Marine Mammal Commission), Anne Hoover-Miller (Pacific Rim Research), Karl Kenyon (U.S. Fish and Wildlife Service, retired), Jon Lewis (Alaska Department of Fish and Game), Richard Merrick (NMFS, National Marine Mammal Laboratory), Karl Schneider (Alaska Department of Fish and Game).

The Recovery Team and NMFS are very grateful to the institutions and agencies that supported the Recovery Team members' participation and logistics in the planning effort. These include the Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, Natural Resources Consultants, U.S. Department of the Navy, Fullerton College, the Pacific States Marine Fisheries Commission, Marine Mammal Commission, and the University of Minnesota.

LIST OF ABBREVIATIONS

ABF	Alaska Board of Fisheries
ADFG	Alaska Department of Fish and Game
CDFG	California Department of Fish and Game
DOS	U.S. Department of State
DFO	Department of Fisheries and Oceans, Canada
ESA	Endangered Species Act of 1973, as amended
FWS/NWR	U.S. Fish and Wildlife Service, National Wildlife Refuge System
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NMML	NMFS, National Marine Mammal Laboratory
NPFMC	North Pacific Fisheries Management Council
ODFW	Oregon Department of Fish and Wildlife
PRBO	Point Reyes Bird Observatory
PSMFC	Pacific States Marine Fisheries Commission
USCG	United States Coast Guard
VNIRO	All-Union Research Institute for Fisheries and Oceanography, Moscow, Russia

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EXECUTIVE SUMMARY

A major decline in the abundance of Steller sea lions has occurred throughout their range over the past 30 years. Counts of adults and juveniles in the region from the Kenai Peninsula to Kiska Island (i.e., the central and western Gulf of Alaska, and the eastern and central Aleutian Islands) declined 63% between 1985 and 1989. The greatest decline occurred in the eastern Aleutian Islands, where 10,802 sea lions were counted in 1985 but only 3,145 in 1989. The number of sea lions at Seguam Island, a rookery in the central Aleutian Islands, declined 80% from 1985 to 1989; pup counts at Seguam also declined 80% from 1985 to 1989. A comparison of trend sites (rookeries and haulouts that have been counted during every major survey) between the late 1950s and 1990 showed an overall decline of 78%. Population modeling suggests that decreased juvenile survival was the most likely cause of the decline in sea lions in the central Gulf of Alaska during 1975-1985. Analysis of 1991 counts indicates an additional decline of approximately 5% in the overall number of animals on the trend sites since 1989-1990.

The number of adult and juvenile animals in the Gulf of Alaska and Aleutian Islands formerly represented about 75% of the world population (Gulf of Alaska = 38%; Aleutian Islands = 37%); however, the proportion is changing as the Alaskan portion of the population declines. Both natural and human-caused factors have been hypothesized as contributing to these declines.

Changes in the quantity or quality of available prey may influence the health and fitness of individual sea lions. Evidence that major shifts have occurred in the abundance of fish in the Bering Sea over the past several decades is well documented. In the 1950s and early 1960s, the most abundant pelagic species was Pacific herring, whose biomass exceeded 3-5 million metric tons. However, rapid increases in the estimated size of walleye pollock stocks in both the Bering Sea and Gulf of Alaska occurred between the 1960s and 1980s. In the late 1970s, walleye pollock biomass increased significantly, from an estimated 0.8 million to more than 3.5 million metric tons. Recent estimates indicate that the pollock biomass has accounted for nearly 85% of the pelagic fish population in that region. Walleye pollock have been shown to be an important prey of Steller sea lions in the Gulf of Alaska, Bering Sea, and North Pacific Ocean. Commercial fisheries which target on several of the most important prey species of Steller sea lions, including pollock, remove millions of metric tons of fish, much of which is potential sea lion food. The development and expansion of commmercial fisheries throughout the species' range may have caused detrimental changes in the sea lions food supply. However, the complexity of ecosystem interactions, and limitations of data and models make it difficult to determine how fishery removals may have influenced the population.

Natural changes in the environment may also be partly responsible for the decline in numbers of Steller sea lions in some areas. The factors responsible for producing these changes, however, are not well known. Thus, although there is evidence suggestive of changes in the abundance of major fish species and the environment, the causes of these changes and their influence on Steller sea lion population trend are largely unknown.

The overall goal of this Recovery Plan is to promote recovery of the Steller sea lion population to a level appropriate to justify removal from ESA listings. Immediate objectives are to identify factors that are limiting the population, to propose a set of actions that will minimize any human-induced activities that may be detrimental to the survival or recovery of the population, and actions necessary to cause the population to increase. Although it is not clear what factors have contributed to the Steller sea lion population decline, and it is apparent that a great deal of information vital to the effective management of the species is lacking, there is an urgent need to take immediate actions to safeguard against further population declines, and to provide for recovery of the species. Immediate actions that should be taken include efforts to reduce human-caused mortality to the lowest level practicable, protection of important habitats through buffer zones and other means, and enhancement of population productivity by ensuring that there is an ample food supply available. Conservation and management measures implemented when Steller sea lions were listed under the ESA, and since, have addressed some of these needs. Additional management actions are described in the Recovery Plan. Progress toward achieving these goals and objectives will be measured by criteria for delisting of the species which are described in the Plan.

The Recovery Team believes that management designed to provide for recovery of the sea lion population should be based on biological principles and ecological understanding. The research program recommended by the Recovery Team will require a considerable amount of funds, time, and effort to produce the information needed to design a complete and effective set of conservation measures. Management agencies therefore should not preclude consideration of more immediate conservation measures or management experiments that could further reduce human impacts, or that would respond to proposals by the scientific community designed to evaluate certain hypotheses.

I. NATURAL HISTORY

A. Species Description

Sea lions belong to the Order Carnivora, Suborder Pinnipedia, Family Otariidae, and Subfamily Otariinae. The family contains the extant genera Arctocephalus, Callorhinus, Eumetopias, Neophoca, Otaria, Phocarctos, and Zalophus. The genus Eumetopias contains one species, the Steller (northern) sea lion, E. jubatus. Unless noted otherwise, all references to sea lions in this document are to Steller sea lions.

Steller sea lions are the largest otariid and show marked sexual dimorphism, males being larger than females. The average adult standard length is 282 cm for males and 228 cm for females (maximum of about 325 cm and 290 cm); weight of males averages 566 kg and females 263 kg (maximum of about 1,120 kg and 350 kg) (Fiscus, 1961; Calkins and Pitcher, 1982; Loughlin and Nelson, 1986). The light buff to reddish brown pelage is slightly darker on the chest and abdomen. Naked parts of the skin are black (King, 1954). Adult males have long, coarse hair on the chest, shoulders, and back; the chest and neck are massive and muscular. Newborn pups are about 1 m long, weigh 16-23 kg, and have a thick, dark-brown coat that molts to lighter brown after 6 months. A more detailed description is provided in Loughlin et al. (1987) and Hoover (1988).

B. Life History

Distribution and Movements

Sea lions probably evolved in temperate waters of the North Pacific Ocean (Repenning and Tedford, 1977). The earliest known remains of an otariid are between 10 and 12 million years old (Repenning, 1976). Three to four million year old fossil remains of Steller sea lions have been found in California.

The present range of Steller sea lions (Figure 1) extends around the North Pacific Ocean rim from northern Japan, the Kuril Islands and Okhotsk Sea, through the Aleutian Islands and Bering Sea, along Alaska's southern coast, and south to California (Kenyon and Rice, 1961; Loughlin et al., 1984). In the western Pacific, animals occasionally haul out as far south as Hokkaido Island in Japan.

The centers of abundance and distribution are the Gulf of Alaska and Aleutian Islands. Seal Rocks, at the entrance to Prince William Sound, Alaska, is the northernmost rookery (60°09'N). Most large rookeries are in the Gulf of Alaska and Aleutian Islands (Kenyon and Rice, 1961; Calkins and Pitcher, 1982; Loughlin et al., 1984; Merrick et al., 1987). Año Nuevo Island off central California is the southernmost rookery (37°06'N), although up until 1981 some pups were born at San Miguel Island (34°05'N). Most of the information on Steller sea lion distribution has been collected during summer months. Distribution during late fall and winter is poorly known.

Steller sea lions are not known to migrate, but they do disperse widely at times of ye other than the breeding season. Males that breed in California are rarely seen in California Oregon except for May through August, and appear to spend the non-breeding months in Al and British Columbia. During fall and winter in Alaska, sea lions may occur at rookeries an haulouts that are used during the summer; they are also seen near sea ice and islands in the northern Bering Sea. Females generally return to rookeries of their birth to pup and breed (Kenyon and Rice, 1961; Calkins and Pitcher, 1982; Loughlin et al., 1984; Calkins, 1986; Kajimura and Loughlin, 1988). Animals marked at rookeries in the Gulf of Alaska have beer sighted in southeast Alaska and British Columbia; some marked in British Columbia have be seen at Cape St. Elias, Alaska; some marked in the eastern Aleutians have been seen in easte Bristol Bay, Alaska; and some marked in Oregon have been seen in northern California, Washington, British Columbia, and southeast Alaska (Calkins and Pitcher, 1982; Calkins, 19 R. Brown, personal communication; NMML files). In most cases, resights have been of juven animals on haulouts. Pups tagged in the Kuril Islands have been resighted in China's Yellow Sea at the Bo Hai bar, and in Japan as far south as Yokahama (NMML files).

There have been limited studies to develop biological criteria for separating animals i different geographic regions into separate populations. A single study of biochemical variatic in Steller sea lions suggested little genetic variation within the Gulf of Alaska (Lidicker et al., 1981). Comparisons are being made among animals from more widely separated locations. work on this subject is ongoing at the NMML. Since animals disperse widely after the breedi season and intermix with animals from other areas, it is difficult to identify individual animal once away from the rookery as belonging to a specific reproductive population.

Habitat Use

Steller sea lion habitat includes marine and terrestrial areas that are used for a variety purposes. The most well-known habitats are the rookeries where adult animals congregate fo pupping and breeding. Rookeries usually occur on beaches of relatively remote islands, often areas exposed to wind and waves, where access by humans and other mammalian predators is difficult. Substrates include sand, gravel, cobble, boulder, and bedrock. Rookeries may exten across low-lying reefs and islands, or may be restricted to a relatively narrow strip of beach by steep cliffs. Rocky points may divide the animals using an area into subgroups.

Female sea lions appear to select places for giving birth that are gently sloping and protected from waves (Sandegren, 1970; Edie, 1977). Pups normally stay on land for about 2 weeks, then spend an increasing amount of time in intertidal areas and swimming near shor

A haulout is the term used to describe areas used by adult sea lions during times other than the breeding season, and by non-breeding adults and subadults throughout the year. Sit used as rookeries in the breeding season may also be used as haulouts during other times of year. Many other rocks, reefs, and beaches are also irregularly used as resting sites. Sea lions are sometimes seen hauled out on jetties and breakwaters, navigational aids, floating docks, a sea ice. Many animals also use traditional rafting sites, which are places where they rest on th ocean surface in a tightly packed group (Bigg, 1985; NMML files).

Although rookeries and haulouts occur in many types of areas, the locations that are used are specific and change little from year to year. Factors that influence the suitability of a particular area may include substrate, exposure, proximity to food resources, tradition of use, and season (Calkins and Pitcher, 1982), as well as the extent and type of human activities in the region (Johnson et al., 1989). Thermoregulatory factors may play an important role in site selection (Gentry, 1970; Sandegren, 1970).

When not on land, Steller sea lions have been seen from nearshore, out to the edge of the continental shelf. Some individuals may enter rivers in pursuit of prey (Jameson and Kenyon, 1977), while in the Gulf of Alaska, they commonly occur near the 200 m depth contour (Kajimura and Loughlin, 1988). They have been caught on fishing lines at depths of 183 m (Kenyon, 1952; Fiscus and Baines, 1966).

Ongoing studies using satellite telemetry are providing detailed information on feeding areas and diving patterns (NMML, unpublished data). Tagging effort has concentrated on adult females in the central Gulf of Alaska and Aleutian Islands. Preliminary analysis of data from six animals tagged in the summer indicated that they stayed close to the rookeries (within 30 km), took brief trips to sea (2 days or less), and made shallow dives (mean depth less than 30 m, with a maximum of 120 m). Data from five animals followed during winter indicate longer trips to sea (up to 4 months), farther offshore (over 450 km), and deeper dives (mean depths up to 84 m, with a maximum of 273 m).

Reproduction

Breeding adult animals, and some subadults, occupy rookeries during the breeding season, which extends from late May to early July (Pitcher and Calkins, 1981; Gisiner, 1985). Some breeding may occur at haulout sites between females which are not giving birth and males which cannot hold territories. Pregnant females arrive at the rookery about 3 days before pups are born (Gentry, 1970). Females frequently return to the same pupping site in successive years, and the pupping site may be the same as or near the site of the female's birth (Sandegren, 1970). Females of reproductive age which were tagged as pups at Rogue Reef, Oregon have been seen at Orford Reef and St. George Reef rookeries (32 km to the north and 56 km to the south, respectively) during the breeding season; one of these females was nursing a pup (R. Brown, personal communication). Copulation generally occurs on the territories at 11 to 14 days postpartum (Gentry, 1970; Sandegren, 1970). Females usually copulate with only one male, not necessarily within the territory where her pup was born (Gentry, 1970; Gisiner, 1985). Once a territory is acquired, a male may occupy it for up to seven consecutive breeding seasons (Gisiner, 1985). Subadult and adult males that are not able to hold territories frequently occupy areas adjacent to rookery areas.

In samples collected during the mid-1980s, 34 of 35 females age 6 years and older had ovulated (Calkins and Goodwin, 1988). Implantation of the embryo occurs late September through early October, after a delay of 3 to 4 months (Pitcher and Calkins, 1981). Implantation is probably linked to the photoperiod 8.5 months prior to birth (J. Tempe, personal communication). Twenty-two of 24 animals (92%) between ages 7 and 20 years were pregnant when they were collected in October (Calkins and Goodwin, 1988). Resorption of the fetus or premature births may occur throughout gestation. Viable births occur from late May through

early July (Pitcher and Calkins, 1981). Birth rates, based on the percent of breeding age females pregnant in April to May, are about 60-75% throughout the range (Belkin, 1966; Pitcher and Calkins, 1981; Calkins and Goodwin, 1988). The sex ratio at birth is close to pa but slightly favors males; twinning is rare.

The pregnancy rate of sexually mature females collected in the Gulf of Alaska during April-May 1985 was 60%, which was lower than the 67% found there in 1975-1978, althoug the difference was not statistically significant (Pitcher and Calkins, 1981; Calkins and Goodwi 1988). There are no data on reproductive rates prior to 1975.

Females reach sexual maturity between 3 and 6 years of age and may produce young into their early 20s (Mathisen et al., 1962; Pitcher and Calkins, 1981). Adult females are monestrous and most breed annually (Pitcher and Calkins, 1981). Males reach sexual maturit between 3 and 7 years of age and physical maturity by age 10 (Perlov, 1971; Pitcher and Calkins, 1981). Thorsteinson and Lensink (1962) found that 90% of males holding territories on rookeries in the western Gulf of Alaska were between 9 and 13 years of age.

Natural Mortality

Causes of pup mortality include drowning, starvation caused by separation from the mother, crushing by larger animals, disease, predation, and biting by females other than the mother (Orr and Poulter, 1967; Edie, 1977). Pup mortality on rookeries has not been thoroughly studied. The number of juveniles counted at Ugamak Island was much lower in 1985-1986 than in the 1970s, which may indicate that the mortality of pups increases after leaving the rookery (Merrick et al., 1988).

Steller sea lions are probably eaten by killer whales and sharks, but the possible impact of these predators is unknown. The occurrence of shark predation on other North Pacific pinnipeds has been documented, but not well quantified (Ainley et al., 1985).

Calkins and Pitcher (1982) used life tables constructed from samples collected in the Gulf of Alaska in 1975-1978 to estimate mortality rates. The estimated mortality rate from birth to age 3 was 0.53 for females and 0.74 for males. Mortality rate for females dropped to 0.11 by the sixth year and remained at about that level in older age classes. Male mortality rates decreased from 0.14 in the third year to 0.12 in the fifth year. Females may live to 30 years and males to about 20 (Calkins and Pitcher, 1982).

York (in preparation) produced a revised life table for female Steller sea lions using the same data as Calkins and Pitcher (1982) but a different model (based on the Weibull survivor function). The estimated annual mortality from York's life table was 0.22 for ages 0-2, dropping to 0.07 at age 3, then increasing gradually to 0.15 by age 10 and 0.20 by age 20. Population modelling suggested that decreased juvenile survival was the most likely cause of the decline in sea lions in the central Gulf of Alaska during 1975-1985 (York, in preparation).

Feeding and Energetics

Diet studies conducted over the past 15 years show that Steller sea lions eat a variety of fishes and invertebrates; demersal and off-bottom schooling fishes predominate (Jones, 1981; Pitcher, 1981). Harbor seals, spotted seals, bearded seals, ringed seals, fur seals, and sea otters are also occasionally eaten (Gentry and Johnson, 1981; Pitcher and Fay, 1982; D. Calkins, unpublished data).

A small number of sea lions collected at sea, or found dead on shore, in California and Oregon had eaten rockfish, hake, flatfish, cusk eel, other fishes, squid, and octopus (Fiscus and Baines, 1966; Jones, 1981; Treacy, 1985). In the Rogue River, 87% of the observations of prey being eaten at the surface were of lamprey (Jameson and Kenyon, 1977). Feeding on lamprey in estuaries and river mouths has also been documented at other sites in Oregon and California (Jones, 1981; Treacy, 1985). Principal prey identified from stomachs and scats collected in British Columbia included hake, herring, octopus, Pacific cod, rockfish, and salmon (Spalding, 1964; Olesiuk et al., 1990). While these data are not comprehensive, especially for California and Oregon, they do show that rockfish and hake are consistently important components of the diet. In the Kuril Islands, Atka mackerel, sand lance, rockfish, and octopus have been identified as important sea lion foods (Panina, 1966).

Results of major diet studies conducted in Alaska since 1975 are summarized in Table 1. Walleye pollock was the principal prey in all areas and years, with Pacific cod, octopus, squid, herring, flatfishes, and sculpins also consumed. Smaller collections of material from the central Bering Sea and eastern Aleutian Islands also indicated that pollock has been an important food, with octopus, squid, rockfish, herring, cod, flatfish, and other fishes also eaten (Lowry et al., 1982; T. R. Loughlin, unpublished data).

Based on measurements of undigested otoliths from stomachs of 90 sea lions collected in the Bering Sea during 1976-1981, the lengths of walleye pollock eaten ranged from 8.2 to 64.2 cm, with a mean fork length of 29.3 cm (Frost and Lowry, 1986). The estimated mean lengths of walleye pollock consumed ranged from 21.8 to 46.9 cm in nine collections made at various locations in the Bering Sea and Gulf of Alaska during 1976-1986 (Lowry et al., 1989).

Seasonal aspects of prey utilization have not been analyzed in detail. Many reports have lumped samples collected at various times of year which may give a false impression of the overall importance of prey species. Pitcher (1981) noted that in the Gulf of Alaska, salmon and capelin were eaten primarily in spring and summer. In the Kodiak Island area where samples were collected in all seasons, walleye pollock, cod, and octopus were eaten throughout the year (Calkins and Pitcher, 1982).

During the breeding season females with pups feed principally at night (Higgins et al., 1988); territorial males remain on land and fast during the breeding season (Spalding, 1964; Gentry, 1970; Withrow, 1982; Gisiner, 1985).

Recent collections have not been thoroughly analyzed for possible variations in diet among different age and sex classes. Because of large differences in body size, and in the behavior of animals of different reproductive status, such variations in the diet may be substantial (Spalding, 1964). Frost and Lowry (1986) measured otoliths from the stomachs of

88 sea lions collected in the western Bering Sea in March-April 1981, and found that sea lions less than 4 years old ate significantly smaller walleye pollock than did older animals (estimated mean fork length 22.4 cm versus 26.9 cm).

Historical data on stomach contents of sea lions collected in Alaska may indicate some long-term changes in diet. Walleye pollock was not a major food of animals collected at Chernabura Island in 1958 (Mathisen et al., 1962), or in Unimak Pass and other locations in 1960 (Fiscus and Baines, 1966). This is in marked contrast to results from 1975-1978; however, the sampling was not comparable in the various studies (Pitcher, 1981). In 1945-1946, seven of eight stomachs examined from southeastern Alaska and five of seven from the Kodiak-Kenai area contained mostly walleye pollock (Imler and Sarber, 1947).

A more recent comparison has been made of stomach contents in sea lions collected in the Gulf of Alaska in 1975-1978 and 1985-1986 (Calkins and Goodwin, 1988). A major difference was that capelin was one of the main prey species in the earlier collection, but did not occur at all in 1985-1986 (Table 2). This was thought to be in part a result of the timing of collections. The relative importance of octopus and flatfish in the diet was much greater in 1985-1986, while herring and squid were of lesser importance. When the overall diet in the Gulf of Alaska for the mid-1970s is compared to samples from Kodiak in 1985-1986, walleye pollock were eaten more frequently (66% versus 58%) and comprised a greater proportion of the stomach contents (58% versus 42%) in the earlier sample.

If only Kodiak area samples are compared (Table 3), walleye pollock was eaten more frequently in the 1980s than the 1970s (58% versus 39%). Walleye pollock consumed in 1985-1986 were of smaller average size (25.4 cm fork length versus 29.8 cm). Capelin and salmon were both important foods in the mid-1970s but were insignificant items in 1985-1986. The average volume of stomach contents for animals collected in the Kodiak area was much greater in 1975-1978 (1,317 ml) than in 1985-1986 (745 ml).

Although there is information available on feeding rates of pinnipeds in general (e.g., Innes et al., 1987), the food and energy requirements of Steller sea lions are not well known. Keyes (1968) concluded that adult, nonpregnant, nonlactating individuals would require 6-10% of their body weight in food per day. However, this estimate was derived from feeding rates of captive sea lions and may not reflect the energy requirements of free-ranging animals. Daily food consumption by an average individual in the population has been estimated to be about 14.3 kg (Calkins, 1988). The amount of food required to provide for energetic needs can vary greatly depending on the energy content of the food and physiological status of the animal (Innes et al., 1987). Pups grow rapidly during their first weeks of life and require a substantial intake of energy which is supplied by the mother. Steller sea lions pups at Año Nuevo Island consumed 1.5-2.4 liters of milk per day while nursing (Higgins et al., 1988). The milk contained 23-25% fat. Perez and Mooney (1986) determined that the average daily feeding rate for lactating northern fur seals was 1.6 times higher than for nonlactating females.

C. Population Status and Trend

Although there is currently no reliable estimate of the total number of Steller sea lions, index counts of animals present on land at standardized dates and times indicate a major

decline has occurred over the past 30 years (Figure 2). Furthermore, a survey throughout the sea lion range in 1989 revealed that the decline is widespread, with a major reduction throughout the area from the Kenai Peninsula to the Kuril Islands (Loughlin et al., 1989; Merrick et al., 1990).

It is difficult to obtain an accurate census of the population because an unknown number of animals are away from the rookery or haulout site and are missed during surveys. Therefore, available counts represent an index of population size, and not an estimate of the total number of sea lions. An estimate of the total population size requires correction factors for missed animals. Correction factors must account for the amount of time the missed animals spend at sea, and the age/sex composition of the uncounted segments of the population. Pup production should also be added to the count for a complete population estimate. Ongoing research using satellite telemetry may provide some of the data needed to calculate correction factors. Based on an analysis of age/sex composition and survival rates, Calkins and Pitcher (1982) suggested that the total number of animals present at the end of the pupping season in the Gulf of Alaska was about 4.5 times the number of pups born. This multiplier was derived from collections made in the mid-1970s and may not be applicable to the current population.

A survey that counted sea lions throughout most of their range was completed in 1989 and the data are currently being prepared for publication by U.S. and Russian biologists. Currently available data on population status and trend for each geographical region are summarized below. However, it must be remembered that these regions are based on geographical and political boundaries, and do not necessarily represent discrete stocks or management units.

Russia (Figures 3 and 4)

A comparison of recent and historic counts of Steller sea lions in the Russian Federation indicates that the present number of animals is about one-third of historic levels (Table 4). In some instances, the decrease in numbers has been accompanied by complete disappearance of rookeries (Perlov, 1991). Numbers of adult and juvenile sea lions at major rookeries and haulouts in the Kuril Islands have declined 74%, from 14,076 in 1969 to 3,615 in 1989 (Merrick et al., 1990). Most of the decline occurred between 1969 and 1974. The numbers since about 1974 appear to have remained stable. Pup numbers have declined 60%, from 3,673 in 1963 to 1,476 in 1989. Based on 1989 counts Burkanov et al. (1991) estimated that the total number of sea lions, including those on haulouts, rookeries and those observed swimming in the water near the site at the time of the survey, along the Kamchatka Peninsula and the Commander Islands was 3,500-3,800. Estimates for this region made in 1982-1985 were 1.6 to 3.5 times larger. This decline is similar to what has occurred in the U.S. portion of the Bering Sea, and is thought likely to continue (Perlov, 1991). There are about 2,000 sea lions on a few small islands in the Sea of Okhotsk, where numbers are reduced from previous levels, but stable (Perlov, 1991).

Alaska (Figures 5 and 6)

The first reported counts of Steller sea lions in Alaska were made in 1956-1960 (Kenyon

and Rice, 1961; Mathisen and Lopp, 1963). The results suggested that there were at least 140,000 Steller sea lions in the Gulf of Alaska and Aleutian Islands at that time (Merrick et al., 1987). Subsequent surveys have shown a major decline in numbers, first detected in the eastern Aleutian Islands in the mid-1970s (Braham et al., 1980). The decline appears to have spread eastward to the Kodiak Island area during the late 1970s and early 1980s and westward to the central and western Aleutian Islands during the early and mid 1980s (Merrick et al., 1987; Byrd, 1989). The greatest declines were observed in the eastern Aleutian Islands and western Gulf of Alaska, but declines also occurred in the central Gulf of Alaska and central Aleutian Islands (Table 5). Sighting data collected from 1976-1979 indicated a total of approximately 104,000 sea lions counted in this region.

Counts of adults and juveniles in the region from the Kenai Peninsula to Kiska Island (i.e., the central and western Gulf of Alaska, and the eastern and central Aleutian Islands) declined 63%, from 67,617 to 24,953, between 1985 and 1989 (Loughlin et al., 1990). The greatest decline occurred in the eastern Aleutian Islands, where 10,802 sea lions were counted in 1985 but only 3,145 in 1989 (Table 5). The greatest decline at any one rookery occurred at Seguam Island in the central Aleutian Islands. The number of sea lions counted at Seguam declined 80% from 2,942 animals in 1985 to 602 in 1989; pup counts at Seguam also declined 80% from 1985 to 1989 (Table 6). At Marmot Island (in the Gulf of Alaska), a 38% decline occurred from 1986 to 1989 in the adult count, and 48% in the pup count. Pinnacle Rock rookery in the western Gulf of Alaska showed the smallest decline of adults and juveniles (at 14%). No surveyed location showed a significant increase.

Aerial and ship-based surveys were again conducted in the Kenai to Kiska region in 1990 (Merrick et al., 1991). The total number of adults and juveniles counted was 27,860. Compared to 1989, there was a decreased number of animals counted in the central Gulf of Alaska, and an increased count in the other three regions (Table 5). Between 1989 and 1990 number of adults and juveniles increased at 12 of 25 rookeries counted. Large declines also occurred at some sites, particularly in the area from Sugarloaf to Chernabura Island. Pup counts at Bogoslof and Seguam Islands increased by 29% from 1989 to 1990, while the pup count at Kiska Island decreased by 25% (Table 6). In most cases, the changes in counts from 1989 to 1990 may be within the range of natural fluctuations and variability inherent in the survey techniques, and therefore should not be interpreted as evidence for a trend.

Some of the apparent variability in abundance based on total counts is almost certainly due to variations in the number of sites that are counted in that year. For example, the higher total count in 1990 represented 152 sites, while only 87 sites were counted in 1989, and this produced a lower total count (Loughlin et al., 1990; Merrick et al., 1991). It is obvious that abundance estimates can be biased due to more or fewer sites being counted in a particular year. Therefore, the analysis of relative population size and trend should be based on sites that are counted in every survey. Merrick et al. (1991) presented an analysis of counts from 77 trend sites (rookeries and haulouts) that have been counted during every major survey. A comparison of the count from trend sites in the late 1950s (105,289) with that from 1990 (22,754) showed an overall decline of 78% (Table 7). The total trend site count was similar in 1989 (23,064) and 1990 (22,754), but there was a substantial change in the central Gulf of Alaska where the count dropped from 8,552 to 7,050. The pattern was similar at rookeries and haulouts. Analysis of 1991 counts indicates an additional decline of approximately 5% in the overall number of animals on the trend sites (Merrick et al., 1992).

Data on sea lion numbers in the Kenai-Kiska region from the trend site analysis show a generally similar pattern of decline when compared with data from all sites counted (Table 7). Since the mid-1970s the number counted on the 77 trend sites has comprised 82-92% of the total number counted. In the late 1950s, however, the trend site count was only 75% of the total count. This may be due partly to the fact that the earlier counts were made without regard to time of year, and they may not be directly comparable with later counts which were all made during June.

Rookeries and haulouts in the western Aleutians have not always been counted on the same schedule as areas to the east. A comparison of that region's non-pup counts made in 1988 with data collected in 1977-1980 showed a decline of 65%, from 27,228 to 9,516 (Byrd and Nysewander, 1988). Subsequent counts have indicated a continued decline (Douglas and Byrd, 1990). Counts in 1990 at Buldir Island and Agattu Island showed decreases of 40% and 23% compared with 1988. Alaid Island counts declined 62% from 1984 to 1990.

Counts of sea lions older than pups at Walrus Island (Pribilof Islands) have declined from 4,000-5,000 in 1960 to about 600 in 1982 (Kenyon, 1962; Loughlin et al., 1984). Counts in 1987 and 1988 were less than 500. Pup production at Walrus Island fell from 2,866 in 1960 to about 334 in 1982 and to 50 in 1991 (NMML, unpublished data).

In the region from the Kenai Peninsula east to Cape St. Elias, counts of adult and juvenile sea lions began to decline sometime after 1980 (Table 8). The 1991 count at Seal Rocks was 59% lower than the peak number counted in 1979. At both Seal Rocks and Cape St. Elias the decline appears to have been rapid during 1989-1991. Counts of pups at Seal Rocks, the only major rookery in the area, have ranged from 491 to 799 during 1978-1991, with no detectable trend (ADFG, unpublished data).

Counts of sea lions in southeast Alaska show a stable or possibly increasing trend (Table 9). The number of animals older than pups counted has ranged from 5,391 to 6,962 during 1979-1991. While no real trend is shown by the non-pup counts, pup counts have increased steadily from 2,220 in 1979 to 4,164 in 1991. A new rookery has become established at Hazy Islands, where about 900 non-pups and 30 pups were counted in 1979; this increased to 1,278 non-pups and 808 pups in 1991. More recently, the White Sisters has begun to be used for pupping. An increase in pup production has occurred at Forrester Island with 3,261 pups counted there in 1991, up from 2,187 in 1979 (ADFG, unpublished data). In 1989-1991, Forrester Island was the largest Steller sea lion rookery in the world.

The number of adult and juvenile animals in the Gulf of Alaska and Aleutian Islands formerly represented about 75% of the world population (Gulf of Alaska = 38%; Aleutian Islands = 37%); however, the proportion is changing as the Alaskan portion of the population declines (Braham et al., 1980; Merrick et al., 1987).

British Columbia (Figure 7)

In British Columbia, major Steller sea lion rookeries occur at North Danger Rocks, Cape St. James, and Triangle, Sartine, and Beresford islands. Extensive sea lion reduction programs were conducted at many locations in British Columbia from 1912 through 1966. In 1913,

10,000-12,000 animals (includes pups) were counted; in 1965 the number was about 4,000 (Bigg, 1985). Pup counts in the 1970s and 1980s have ranged from about 1,000 to 1,400 with no identifiable trend. The most recent census was in 1987 when 1,084 pups and 6,109 non-pups were counted (P. Olesiuk, personal communication). Bigg (1988) speculated that a northward shift in distribution may have occurred from rookeries in British Columbia, which could partly explain the increase in sea lion numbers in southeast Alaska.

Washington, Oregon, and California (Figure 8)

There are no Steller sea lion rookeries in Washington State, although animals do occur there during some times of year. Jagged Island and Split Rock are used as summer haulouts, and Umatilla Reef is used during the winter (NMML, unpublished data). Cape Flattery is occasionally used for hauling out. There are no data available that can be used to evaluate trends in numbers of Steller sea lions in Washington.

Counts of Steller sea lions in Oregon have been relatively stable since 1981 at about 2,000-3,000 animals. Statistical analysis of all data collected since 1976 indicates an increase in numbers, but this may be an artifact of improved surveys in recent years (Brown, 1990). Rookeries at Rogue Reef account for 1,000-1,250 non-pups and 200-400 pups; at Orford Reef there are 700-900 non-pups and about 100-200 pups born each year (Table 10). Counts at both localities have been variable, and generally show no strong trend. However, the count of adults and juveniles at Orford Reef declined from 1986 through 1989 coincident with increased sea urchin harvesting activity near the rookery (Brown, 1990). Restrictions of urchin harvest near Orford Reef rookeries appear to have resulted in an increase in counts in 1990 (R. Brown, personal communication).

Numbers in California have declined, especially in southern California (Table 11). San Miguel Island was the southernmost rookery within recent historical record, but no adults have been seen there since 1983 and no births have been recorded since 1981 (R. DeLong, personal communication). Currently the southernmost breeding site is Año Nuevo Island. Historically, peak counts ranged between 1,500 and 2,500. Since 1984, counts there during the breeding season have consistently been below 1,200. Counts in 1988 and 1990 resulted in a total of less than 600 adults and juveniles (Le Boeuf and Morris, 1990; R. Gisiner, personal communication). Año Nuevo Island produces more pups than any other rookery in California. Pup production from 1980-1985 was about 300 pups per year (M. Pearson, personal communication); a minimum of 139 pups was born there in 1990 (Le Boeuf and Morris, 1990). At the Farallon Islands, adult and juvenile numbers during the breeding season have declined from approximately 200 in the late 1970s and early 1980s, to less than 100 individuals in 1989 and 1990 (D. Ainley, personal communication). Pup production has steadily declined over this time; only three pups were born there each year in 1988, 1989, and 1990. It is possible that the Farallon Islands may cease to be a breeding site in the near future. Bonnell et al. (1983) counted approximately 900 non-pups and 117-137 pups at the Sugarloaf/Cape Mendocino rookery during the 1980-1982 breeding seasons. In May 1989, approximately 300 adults and juveniles were seen on Sugarloaf. The 1989 count was made several weeks before peak numbers of sea lion adults and pups are usually attained, and based on seasonal trends in numbers, it is likely that 800-900 adults and juveniles would have been present during June-July. During 1980-1982, about 250 non-pups and 10-25 pups were seen on the St. George Reef

rookery each year. A count of 674 non-pups and 124 pups was reported from the St. George Reef rookery in 1990 (R. Brown, personal communication). Statewide, counts between 1927 and 1947 ranged between 5,000 and 7,000 non-pups with no apparent trend, but have subsequently declined by over 50%, remaining at about 2,000 to 2,500 non-pups between 1980 and 1990.

These data, together with a limited number of counts made during other times of year by Bonnell et al. (1983) and Bonnot and Ripley (1948), suggest that there may have been a northward shift in the species' distribution in California. Changes in breeding season numbers have been less pronounced and slower than changes in distribution outside the breeding season, perhaps due to breeding site fidelity. Tagging, satellite telemetry, and coordinated counts with other parts of the species' range are needed to determine the relative contributions of emigration and reduced productivity to the decline in numbers of Steller sea lions in California.

D. Natural Factors Influencing the Population

Predation

Although Steller sea lions are preyed upon by certain other species (e.g., killer whales and sharks), there is no scientific evidence to suggest that the incidence of predation has increased in recent years. It seems unlikely that increased predator activity could explain the recent widespread decline in sea lion numbers.

Parasitism and Disease

Parasites of Steller sea lions include intestinal cestodes; trematodes in the intestine and bile duct of the liver; nematodes in the stomach, intestine, and lungs; acanthocephalans in the intestine; acarian mites in the nasopharynx and lungs; and an anopluran skin louse (Dailey and Hill, 1970; Dailey and Brownell, 1972). Shults (1986) reported 11 species of helminth parasites from sea lions in the Gulf of Alaska, and nine species from the Bering Sea. A severe infection of nematodes can cause stomach ulcers, but the number of deaths attributable to this cause is probably very small. However, there has not been adequate research to assess the nature and importance of parasitism in sea lions.

The prevalence of disease is difficult to evaluate because most specimens analyzed have come from animals that appeared healthy when they were collected. In addition to gastric ulceration mentioned above, histopathological analyses have revealed mild cases of hepatitis, myocarditis, and pneumonia (T. Spraker, personal communication).

Reproductive failure and neonate, juvenile, and adult mortality resulting from disease probably occur in Steller sea lions. Antibodies to two types of bacteria (Leptospira and Chlamydia), one marine calicivirus (San Miguel Sea Lion Virus), and seal herpesvirus (SeHV), which could produce such effects, were present in blood taken from Steller sea lions in Alaska (Barlough et al., 1987; Vedder et al., 1987; Calkins and Goodwin, 1988). Leptospires are spirochete bacteria and are suspected agents of abortions and adult mortality in California sea lions

and northern fur seals. Calkins and Goodwin (1988) found a low incidence of Leptospirosis and concluded that it was not a significant factor in the decline of Steller sea lions in the Kodiak area in the 1980s. San Miguel Sea Lion Virus has been associated with reproductive failures or neonatal deaths in California sea lions and northern fur seals (Smith et al., 1974; Gilmartin et al., 1976). Chlamydia had not been studied in sea lions prior to the work of Calkins and Goodwin (1988). These and other agents are currently under study to examine their possible adverse effects on Steller sea lions, but much additional work is needed.

Environmental Change

Sea lion behavior and survival could be influenced by changes in environmental conditions which might affect the suitability of the environment for sea lions. No trends have been observed that relate the decline in Steller sea lion numbers to such changes. Data bases on weather and oceanography in the North Pacific are extensive. York (in press) examined the relationship between sea surface temperature and early survival of Pribilof fur seals. While a significant positive correlation was found, cause and effect relationships could not be identified. A model constructed by Trites (1990a) has shown that thermal conditions on land could affect early survival of fur seal pups, but that the animals generally are able to tolerate the range of conditions to which they are normally exposed. The data that have been collected on Steller sea lions are not adequate for use in such analyses (Anonymous, 1990), and it is likely that attempts to do environmental correlation studies for sea lions would be even more inconclusive than for fur seals. Furthermore, sea lions inhabit an area encompassing approximately 30 degrees of latitude, and they therefore must be able to tolerate a relatively wide range of environmental conditions. It seems very unlikely, overall, that changes in meteorologic and climatologic conditions per se could directly explain the major decline in sea lion numbers that has occurred in the core of their range.

If environmental changes affected the abundance or availability of a necessary food resource, the survival and productivity of sea lions could be reduced. These types of responses by pinniped populations have occurred as a result of El Niño events (Trillmich and Ono, 1991). A study of foraging patterns and energetics of Antarctic fur seals showed a dramatic effect of changes in prey (krill) availability on nutrition and growth of pups (Costa et al., 1989). Lactating females provided their pups with the same amount of milk each time they came ashore regardless of whether food was abundant or scarce. However, in a year when krill were less abundant and more dispersed, feeding trips were almost twice as long (8.4 days versus 4.5 days). This resulted in the pups receiving about half as much milk per day, and correspondingly low pup growth rates. In the year of low food availability, 32% of the pups died, 68% due to starvation. These values were approximately double the normal rates.

Evidence that major shifts have occurred in the abundance of fish and shellfish in the Bering Sea over the past several decades is well documented. Naumenko et al. (1990), for example, note that "in the last four decades the community of pelagic fishes in the western Bering Sea has shown considerable structural change." In the 1950s and early 1960s, the most abundant pelagic species was Pacific herring, whose biomass exceeded 3-5 million metric tons. However, in the late 1970s, walleye pollock biomass increased significantly (from an estimated 0.8 million metric tons to over 3.5 million) and more than doubled the herring biomass. Recent estimates indicate that the walleye pollock biomass has accounted for nearly 85% of the pelagic fish population in that region.

Others have noted major shifts in the abundance of fish and shellfish stocks in the eastern Bering Sea characterized by rapid growth of the salmon, Pacific cod, and flatfish populations in the early 1980s, with corresponding declines in shrimp and crab populations. Rapid increases in the estimated size of walleye pollock stocks in both the Bering Sea and Gulf of Alaska occurred between the 1960s and 1980s (Natural Resources Consultants, 1983; Larkin et al., 1990; Quinn and Collie, 1990).

The factors responsible for producing these changes, however, are not well known. A number of authors note that there has been a general warming in the Bering and Okhotsk seas over the past three decades and theorize that shifts in temperature and wind patterns may have influenced recruitment and fish and shellfish population trends, but supporting oceanographic data are largely absent (Swan and Ingraham, 1984; Khen and Glebova, 1990; Rodinov and Krounin, 1990). Furthermore, many of the population changes in both fish and shellfish have occurred during and following periods of intense fishing activity. Thus, although there is evidence suggestive of changes in the abundance of major fish species and the environment, the causes of these changes and their influence on Steller sea lion population trend are largely unknown. Further studies to examine these relationships would be useful as an aid to evaluating natural versus human factors that may be influencing sea lion population changes.

2. KNOWN AND POTENTIAL HUMAN IMPACTS

Commercial Harvest

There is currently no commercial harvest for Steller sea lions. They were commercially harvested in the eastern Aleutian Islands and Gulf of Alaska from 1959 to 1972 (Merrick et al., 1987). An experimental harvest in 1959 resulted in 616 adult males being taken (Thorsteinson and Lensink, 1962). A total of 45,178 pups of both sexes were harvested in the eastern Aleutian Islands and Gulf of Alaska between 1963 and 1972 (Merrick et al., 1987). The largest harvests were conducted between 1963 and 1972 at Sugarloaf and Marmot islands where 16,763 and 14,180 pups were killed, and between 1970 and 1972 at Ugamak and Akutan islands where 3,773 and 6,036 pups were killed. The pup harvests, which sometimes reached 50% of the total pup production from a rookery, could have depressed recruitment in the short term. This may partially explain the declines at some sites through the mid-1970s. However, it does not explain why numbers declined in areas where no harvest occurred (Merrick et al., 1987), or why declines did not occur until approximately 20 years after the harvests (e.g., at Marmot and Sugarloaf islands).

During the period from 1912 through 1968, thousands of Steller sea lions were killed on rookeries and haulouts in British Columbia (Bigg, 1985). Information on the harvest of sea lions in the Soviet Union is not available.

Subsistence Harvest

The MMPA authorizes Alaska Natives to harvest and use Steller sea lions. This use can continue even if the species is listed as depleted, as long as it is for subsistence purposes and is done in a non-wasteful manner. The ESA also contains provisions that allow for the continued

subsistence use of listed species. Both the ESA and the MMPA contain provisions that allow the subsistence harvest of endangered, threatened, or depleted species to be regulated, if necessary.

The archaeological record confirms that coastal Alaska Natives have for centuries harvested and used sea lions for subsistence purposes. Historical sources document continuous use in Alaska since Russian contact. Most parts of the animal were used as food or fashioned into tools, clothing, and decorative crafts. Sea lions historically were and presently are used primarily in areas dominated by a Pacific maritime climate, where they replace the Pacific walrus which fills a similar role in more northern areas.

During the past decade, the subsistence harvest of sea lions has been documented in Prince William Sound, lower Cook Inlet, Kodiak Island, Alaska Peninsula, Pribilof Islands, and to some extent in the Aleutian Islands (Haynes and Mishler, 1991). Less is known about the extent of subsistence uses in Bristol Bay, the Yukon-Kuskokwim Delta, and southeast Alaska. Annual statewide harvest levels have not been systematically documented, but single year estimates or reported harvest data are available for some communities, including: Akhiok (7 in 1989); Atka (15-25 in 1982-1983); Chenega Bay (15 in 1984); English Bay (2 in 1989); Manokotak (15 in 1985); Old Harbor (26 in 1989), Perryville (10 in 1989-1990); Quinhagak (16 in 1982); St. George (35-40 in 1980-1981); St. Paul (35 in 1980-1981); Tatitlek (14 in 1989-1990); and Unalaska (20 in 1981-1982). Sea lions remain an important traditional food resource today in these and other communities. Systematic fieldwork is required to estimate accurately the statewide subsistence harvest and to determine whether the annual harvest levels in these and other communities fluctuate significantly from year to year.

Fishery-related Taking

Many Steller sea lions have been taken incidental to commercial fishing operations in the Bering Sea and North Pacific Ocean. In 1978-1981, the estimated annual mortality for all foreign vessels was 724 animals (Loughlin et al., 1983). That did not include animals taken by U.S. fishermen fishing either in joint ventures, or independently. The incidental take of sea lions by U.S. trawlers in 1982 in the Shelikof Strait (near Kodiak Island, Alaska) walleye pollock joint venture fishery was estimated to be 958 to 1,436 sea lions (Loughlin and Nelson, 1986). The estimated take declined to less than 400 per season in 1983 and 1984, probably due to changes in fishing techniques and the area and times fished. Less than 100 per year were estimated to have been taken during 1985-1987 as the fishery diminished in total fish take and effort (T. Loughlin, personal communication).

Perez and Loughlin (1990) found that about 3,000 Steller sea lions were observed incidentally caught in foreign and joint venture trawl fisheries during 1973-1988. For the period 1978-1988, the observed take was extrapolated with fish catch data to obtain an estimate of 6,543 sea lions incidentally caught. Using observer data and fisheries statistics for 1973-1977, they back-calculated for the period 1966-1977 and estimated that about 14,830 sea lions were killed incidental to trawl fisheries during that period. The total estimated incidental catch of Steller sea lions during 1966-1988 in foreign and joint-venture trawl fisheries was over 20,000 animals. Perez and Loughlin concluded that incidental catch was a contributing factor to the sea lion decline during the 1970s.

In California there has been a small incidental take (less than five individuals per year) in gillnet fisheries for California halibut, flounder, and sharks (Wild, 1986). An experimental shark gillnet fishery operated off Oregon in 1986-1988; one Steller sea lion was recorded taken in 1987. Since 1976 Steller sea lions have been occasionally taken (approximately one every other year) in the joint venture trawl fishery for hake that operates off Oregon, Washington, and northern California (J. Scordino, personal communication).

An observer program mandated by amendments to the MMPA in 1988 requires observer coverage on some domestic fishing vessels. The amount of observer coverage in particular fisheries varies according to the anticipated or documented frequency with which marine mammals are taken incidentally. A final compilation of information from the observer program on incidental catch of marine mammals in 1989 is not yet available, but preliminary results indicate that the level of observed catch of Steller sea lions is much lower than it was previously.

In some areas Steller sea lions are known to have been shot deliberately by fishermen, but it is unclear how such killing may have affected the population. Fishermen have been seen killing adult animals at rookeries, haulout sites, and in the water near boats, but the magnitude of this take is generally unknown. One of the few estimates of shooting mortality is reported by Matkin and Fay (1980) who calculated that 305 Steller sea lions were killed directly (shot) while interfering with fishing operations in the spring 1978 Copper River Delta salmon gillnet fishery. Data from a 1988-89 study of the Copper River salmon gillnet fishery indicated that the level of directed kill of sea lions was significantly less than during 1978 (Wynne, 1990). During the 1960s, Steller sea lions were killed at sites in the eastern Aleutian Islands and used for bait by crab fishermen. This killing may have had a significant effect in local areas and might have caused animals to move away from certain rookeries and haulout sites (Loughlin and Nelson, 1986; Merrick et al., 1987).

Competition for Food

Commercial fisheries target on several of the most important prey species of Steller sea lions. In combination, these fisheries remove millions of metric tons of fish, much of which is potential sea lion food. However, the complexity of ecosystem interactions, and limitations of data and models make it difficult to determine whether fishery removals have influenced the population of sea lions, or any other marine mammal species (Lowry et al., 1982; Harwood and Croxall, 1988; Loughlin and Merrick, 1989).

Changes in the quantity or quality of available prey may influence the health and fitness of individual sea lions, resulting in reduced reproductive potential or perhaps death (Loughlin and Merrick, 1989). Walleye pollock have been shown to be an important prey of Steller sea lions in the Gulf of Alaska, Bering Sea, and North Pacific Ocean (Klumov, 1957; Pitcher, 1981; Calkins and Goodwin, 1988; Lowry et al., 1989). Age-structured population models indicate that since the 1960s, walleye pollock biomass in the eastern Bering Sea has fluctuated twice between 4 million metric tons and 10 million metric tons. Peaks in biomass occurred in the early 1970s and the mid-1980s due to strong year classes in 1965-1968, and 1978, 1982, and 1984 (Bakkala et al., 1987). While the overall biomass of pollock has remained relatively high, low abundance of certain age classes in some years could have resulted in fewer fish available in the size range usually consumed by sea lions (Lowry et al., 1989). Availability of certain sized prey may be particularly important

for juvenile sea lions which on average feed on smaller fishes (Frost and Lowry, 1986). During the period 1988-1990 there was a 10-15% annual decline in biomass of walleye pollock in the Aleutian Basin (Niemeier and Kelsky, 1990).

In the Gulf of Alaska, the walleye pollock stock is smaller than in the Bering Sea. Trawl surveys have been used to estimate demersal walleye pollock biomass and hydroacoustics have provided estimates of the off-bottom component of the population. Hydroacoustic surveys showed that the walleye pollock biomass in Shelikof Strait declined from 3.7 million metric tons in 1981 to 0.29 million metric tons in 1989, with a small increase in 1990 (Hollowed, 1991). Gulf-wide bottom trawl surveys indicate that the demersal component of the population has been relatively stable since 1984, ranging between 0.69 and 0.85 million metric tons. Stock assessments based on an age-structured model suggest that walleye pollock biomass in the Gulf increased from 1-2 million metric tons in the late 1970s, peaked in 1982 at about 4 million metric tons, then declined to about the late 1970s level (Hollowed, 1991). The increase was attributed to five consecutive strong year classes from 1975 to 1979. Relatively weak year classes occurred in 1980-1983, 1986, and 1987.

Body sizes of sea lions in the Gulf of Alaska (girth, weight, and standard length) were significantly less for age 1-10 animals sampled in 1985-1986, as compared to the 1970s (Calkins and Goodwin, 1988). This difference was interpreted as a reflection of nutritional stress in sea lions which was caused by changes in prey availability in the Gulf of Alaska ecosystem.

From British Columbia southward to California, hake, rockfish, and herring are important Steller sea lion prey. The expansion of commercial fisheries for these species may be correlated with the decline in numbers of sea lions at major rookeries (D. Ainley, personal communication). Shifts in the abundance and distribution of herring, possibly related to fisheries, may have influenced the distribution and recovery of sea lions in British Columbia (Bigg, 1988).

Fish resource assessment surveys provide the only data available for evaluating the status of sea lion food resources. These surveys, however, encompass large regions and may not reflect the amount, size, and species of prey available in actual sea lion feeding areas. Sampling is usually done in spring or summer and may not provide an adequate measure of prey distribution at important times. Also, commercial fish resource surveys generally do not include or do not adequately sample many potentially important prey species such as capelin, eulachon, herring, squid, and octopus. In spite of these limitations, additional analyses of information contained in resource assessment databases may be of some use in understanding sea lion feeding ecology.

In addition to larger scale changes in abundance of food, fisheries could affect sea lion nutrition by causing localized prey depletion or by disrupting fish behavior as nets pass through schools. Such changes could result in sea lions expending more energy to obtain prey.

Toxic Substances

Organochloride pollutant residues in the tissues of California sea lions have been associated with reproductive failure (DeLong et al., 1973; Gilmartin et al., 1976) and have been shown to cause reproductive failure in harbor seals in the Dutch Wadden Sea (Reijnders, 1987). Contaminants also have the potential to affect the immune system which could make animals more

susceptible to disease (P. Reijnders, personal communication).

NMFS has begun analyzing tissues from Steller sea lions collected in Alaska for organochloride pollutant residues and other toxic substances. Preliminary studies found generally low levels of contaminants, with the exception of two young males from southeast Alaska that had relatively high levels of PCBs and DDTs in the blubber (U. Varanasi, unpublished data). Additional analyses are being conducted. A study conducted at the Farallon Islands was inconclusive (Huber et al., 1984). Relatively low levels of cadmium and zinc were found in tissues of sea lions collected from Hokkaido, Japan (Hamanaka et al., 1982).

Sea lions contacted oil in 1989 during the Exxon Valdez oil spill, and analysis of tissue samples indicated some evidence of exposure to hydrocarbons. However, there was no conclusive evidence that exposure to oil resulted in injury or death to sea lions (ADFG, unpublished data).

Entanglement in Debris

Data collected from 1975 to 1985 in the Gulf of Alaska and southeast Alaska showed that Steller sea lions may become entangled in lost and discarded fishing gear, and that closed packing bands and net material (principally trawl net) accounted for the majority of observed entanglements (Calkins, 1985). Animals over 2 years old (of both sexes) were susceptible, although more adult females were observed entangled than males. No records of entangled sea lion pups or yearlings were reported. There were no data presented on the number of animals observed entangled or the rate of entanglement in relation to the Gulf of Alaska or southeast Alaska sea lion population.

A study conducted in the Aleutian Islands during June-July 1985 found that a very low percentage (approximately 0.07%) of observed sea lions were entangled in net or twine; none were entangled in packing bands (Loughlin et al., 1986). The data from the initial study were inadequate to address the magnitude or nature of entanglement of pups-of-the-year since most pups were too young during the survey to have encountered debris in the water or away from the rookery. A follow-up study was conducted during November 1986 to assess the magnitude of entanglement of sea lion pups in the eastern Aleutian Islands. No entangled pups were seen, and only one entangled juvenile was seen out of a total of 3,847 sea lions observed during the study (Loughlin et al., 1986).

In summary, adult Steller sea lions entangled in packing bands and net fragments have been observed, but rarely. Entangled pups and juvenile animals are infrequently observed, but entangled animals may die at sea and thus not be seen on land. Based on existing information, however, it seems unlikely that entanglement in debris is a major factor in the observed population decline.

Disturbance

The possible impacts on Steller sea lions by various types of disturbance have not been specifically studied. Close approach by humans, boats, or aircraft will cause hauled-out sea lions to go into the water. Disturbances that cause stampedes on rookeries may cause trampling or

abandonment of pups (Calkins and Pitcher, 1982; Lewis, 1987). The discharge of firearms at or near hauled out animals may have a particularly dramatic effect. Areas subjected to repeated disturbance may be permanently abandoned (Kenyon, 1962). Repeated disturbances that result in abandonment or reduced use of rookeries by lactating females could negatively affect condition and survival of pups through interruption of normal nursing cycles. Low levels of occasional disturbance may have little long-term effect.

There have been relatively few well-documented instances of disturbance. Disturbance of rookeries at Orford Reef, Oregon (R. Brown, personal communication) and the Farallon Islands, California (D. Ainley, personal communication), resulting from the activities of sea urchin fishermen, has been reported. At the Farallon Islands, this disturbance resulted in a distributional shift of a breeding group to a nearby, undisturbed site. The harassment and killing of sea lions in British Columbia (before 1970) resulted in the cessation of breeding at some rookeries and abandonment at others (Bigg, 1988).

Development such as would be associated with Outer Continental Shelf oil exploration and production may result in a substantial amount of onshore and offshore activity in Steller sea lion habitat. Activities such as sea floor mining could disrupt feeding areas, and result in lowered condition, particularly for lactating females and pups. The increased disturbance that may result from such human activities could have subtle, but significant, impacts on recovery of the sea lion population.

3. SUMMARY AND CONCLUSIONS

Although the data available on abundance of Steller sea lions, and changes that have occurred over time, are not as comprehensive as is desirable, it is certain that a major population decline has occurred. The decline has been most dramatic in the core of the species' range, the central and western Gulf of Alaska and Aleutian Islands, where total counts dropped by more than 100,000 animals from 1960 to 1990. Numbers of sea lions have also declined in the central Bering Sea and waters of the Soviet Union. In the region from southeast Alaska through Oregon, Steller sea lion numbers appear to have remained relatively stable, and no significant declines have been noted in recent years. However, the number of Steller sea lions has decreased greatly at rookeries in central and southern California.

Both natural and human-caused factors have been hypothesized as contributing to these declines. Natural changes in the environment may be partly responsible for the decline in numbers of Steller sea lions in some areas. Throughout most of the species' range, census data have been collected only in the past 30 years, and there is no way to know what kind of population fluctuations may have occurred previous to that period. Similarly, there is no way to evaluate whether or not the high population levels of the late 1950s were indicative of the long-term ability of the ecosystem to support sea lions. Factors such as disease and predation may have had an influence on the population, but there is not sufficient information to evaluate their possible impact.

A variety of human activities may have influenced Steller sea lions. It is certain that many thousands of animals were killed in commercial harvests, control programs, fisheries, and subsistence hunts. Marine debris does not appear to have had a major impact on sea lion numbers.

Although studies of chemical pollutant loads are incomplete, the relatively low level of industrial activity in the central portion of the species range would suggest that pollution has not been a cause of the decline. Increased human presence in the marine environment has resulted in the disturbance of important habitats such as rookeries. The development and expansion of commercial fisheries throughout the species' range may have caused detrimental changes in the sea lions' food supply.

The Recovery Team is aware that fur seals on the Pribilof Islands and harbor seals in parts of the Gulf of Alaska have also shown substantial population declines (Fowler, 1990; Pitcher, 1990). Causes for those declines are unclear. Entanglement in debris has contributed to the problem with fur seals (Fowler, 1985), and food limitation of juveniles has also been suggested as a possible factor (Trites, 1990b). Several of the principal prey species of Steller sea lions are the same as those used by fur seals and harbor seals. However, many other life history features and ecological characteristics differ considerably among the three species. The coincidence of these declines in fish-eating pinniped populations emphasizes the need for a broad approach to investigation of the problem and development of solutions.

Overall, it is not clear what factors have contributed to the Steller sea lion population decline, and it is apparent that a great deal of information vital to the effective management of the species is lacking. In spite of these information voids, there is an urgent need to take immediate actions to safeguard against further population declines, and to provide for recovery of the species. Immediate actions that can and should be taken include efforts to reduce human-caused mortality to the lowest level practicable, protection of important habitats through buffer zones and other means, and enhancement of population productivity by ensuring that there is an ample food supply available. Conservation measures implemented when Steller sea lions were listed under the ESA have addressed some of these management needs. Additional management actions are described in the Recovery Plan.

The Recovery Team believes that management designed to provide for recovery of the sea lion population should be based on biological principles and ecological understanding. The research program recommended by the Recovery Team and described in the Narrative Section of this Recovery Plan will require a considerable amount of funds, time, and effort to produce the information needed to design a complete and effective set of conservation measures. Management agencies therefore should not preclude consideration of more immediate conservation measures or management experiments that could further reduce human impacts, or that would respond to proposals by the scientific community designed to evaluate certain hypotheses.

The Recovery Team is aware that some of the research activities proposed may themselves have negative impacts. However, rather than limit the Recovery Plan's range of action by excluding such activities, we have included them if they may result in information that is critical to understanding the sea lion problem. The potential positive and negative impacts should be examined on a case-by-case basis using the best current information at the time scientific research permits are requested.

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5. TABLES

Table 1. Rank order of importance of prey found in the stomachs of Steller sea lions collected in Alaska (based on Combined Rank Index).

RANK	Gulf of Alaska[1] 1975-78 N = 153	Kodiak Area[2] 1985-86 N = 74	Southeast Alaska[2] 1986 N = 14	Bering Sea[3] 1981 N = 86
1	Walleye Pollock	Walleye Pollock	Walleye Pollock	Walleye Pollock
2	Squids	Octopus	Pacific Cod	Pacific Cod
3	Pacific Herring	Flatfishes	Squids	Sculpins
4	Capelin	Pacific Sand lance	Flatfishes	Herring
5	Pacific Cod	Pacific Cod	Pacific Herring	Octopus
6	Pacific Salmon	Pacific Salmon	Pacific Salmon	Flatfishes
7	Octopus	Squids	Octopus	Squids

[1] Pitcher, 1981
[2] Calkins and Goodwin, 1988
[3] D. Calkins, unpubl. data

Table 2. All prey identified from stomachs of Steller sea lions collected in the Gulf of Alaska during 1975-1978 (n = 153) and 1985-1986 (n = 74) (adapted from Calkins and Goodwin, 1988)

	Occurences				Volume			
	1970s		1980s		1970s		1980s	
PREY	No.	%	No.	%	ml	%	ml	%
INVERTEBRATES								
Snails	2	1.3	0	0.0	20	<0.1	0	0.0
Octopus	20	13.1	24	32.4	250	<0.1	14,379	26.0
Squid	35	22.9	3	4.0	15,507	4.2	50	0.1
Mollusc spp.	1	0.7	0	0.0	20	<0.1	0	0.0
Shrimps	8	5.2	2	2.7	100	<0.1	trace	<0.1
Tanner crab	2	1.3	0	0.0	20	<0.1	0	0.0
Spider Crab	1	0.7	0	0.0	10	<0.1	0	0.0
Crab spp.	1	0.7	1	1.4	10	<0.1	trace	<0.1
FISHES								
Herring	16	10.7	2	2.7	76,920	20.6	trace	<0.1
Salmon	6	3.9	2	2.7	19,160	5.1	320	0.6
Capelin	16	10.5	0	0.0	27,755	7.5	0	0.0
Sand Lance	0	0.0	5	6.8	0	0.0	1,580	2.9
Walleye Pollock	102	66.7	43	58.1	217,746	58.3	23,370	42.2
Saffron Cod	2	1.3	0	0.0	815	0.2	0	0.0
Pacific Cod	19	12.4	5	6.8	3,471	0.9	1,205	2.2
Pacific Tomcod	1	0.7	0	0.0	680	0.2	0	0.0
Gadid spp.	2	1.3	0	0.0	60	<0.1	0	0.0
Eelpout	1	0.7	0	0.0	10	<0.1	0	0.0
Rockfish	4	2.6	0	0.0	3,030	0.8	0	0.0
Sculpins	6	3.9	1	1.4	4,960	1.3	325	0.6
Sturgeon Poacher	1	0.7	0	0.0	60	<0.1	0	0.0
Pacific Sandfish	2	1.3	0	0.0	300	<0.1	0	0.0
Flatfishes	7	4.6	10	13.5	1,030	0.3	13,910	25.2
Skates	1	0.7	0	0.0	960	0.3	0	0.0
OTHER ITEMS								
Harbor Seal	1	0.7	0		250	<0.1	0	0.0
TOTALS	261		98		373,184		55,139	

Table 3. Major prey identified from stomachs of Steller sea lions collected near Kodiak 1975-1978 (n = 49) and 1985-86 (n = 74) (adapted from Calkins and Pitcher, 1981 and Calkins and Goodwin, 1988).

	Kodiak 1975-78[1]		Kodiak 1985-86	
	% Frequency	% Volume	% Frequency	% Volume
Walleye Pollock	38.9	22.8	58.1	42.2
Capelin	28.6	43.0	0.0	0.0
Pacific Salmon	8.2	27.9	2.7	0.6
Pacific Cod	18.4	3.4	6.8	2.2
Flatfish	10.2	0.3	13.5	25.2
Octopus	28.6	0.2	32.4	26.0
Mean Volume of Contents	1317 ml		745 ml	

[1] Data shown here are for a subsample of the 153 animals shown in Table 2.

Table 4. Counts of Steller sea lions in Russia during 1988-1989 and prior to the decline in abundance (adapted from Perlov, 1991).

Location	1988-1989	Prior to Decline
Kamchatka	3,500-3,800	10,000-14,000
Kuril Islands	5,000-7,000	15,000-20,000
Commander Islands	2,400-2,600	10,000
Iony Island	1,500	5,000-6,000
Iamskiy Island	900	1,000
Tyulenii Island	200	200
Opasnosti Rock	300	300
TOTAL	13,800-16,300	42,500-52,300

Table 5. Counts and percent declines of adult and juvenile Steller sea lions at all sites in spring and summer 1956 to 1989 in the Aleutian Islands and Gulf of Alaska (from Merrick et al., 1987, 1990, 1991; Loughlin et al., 1990)[1].

YEAR	Central Gulf of Alaska	Western Gulf of Alaska	Eastern Aleutian Islands	Central Aleutian Islands	TOTA
1956	---	24,320	---	---	
1957	35,150	---	---	---	
1959	---	---	---	28,115	140,115
1960	---	---	52,530	---	
1962	---	---	---	31,040	
1975	---	---	21,221	---	
1976	30,677	9,480	22,142	---	103,976
1977	---	---	23,922	---	
1978	---	14,917	---	---	
1979	---	---	---	41,677	
1984	---	---	9,833	---	
1985	24,389	6,667	10,802	25,759	67,617
1989	9,614	4,435	3,145	7,759	24,953
1990	8,943	5,331	4,875	8,711	27,860
Decline Overall[4]	75%	78%	91%	69%	80%

[1] Dashes indicate that no counts were made

[2] Based on 1956 count for western Gulf of Alaska, 1957 count for central Gulf of Alaska, 1958 count for central Aleutian Islands, and 1960 count for eastern Aleutian Islands

[3] Based on 1976 counts for central Gulf of Alaska, western Gulf of Alaska, and eastern Aleutian Islands, and 1979 count for central Aleutian Islands

[4] Declines calculated from earliest survey date

Table 6. Counts of Steller sea lion pups at sites in the Aleutian Islands and Gulf of Alaska, 1979-1990 (from Early et al., 1980; Calkins and Pitcher, 1982; Merrick et al., 1987, 1990, 1991: Calkins and Goodwin, 1988; Byrd, 1989; Loughlin et al., 1990; NMML files)[1].

ISLAND	1979	1984	1985	1986	1989	1990
Western Aleutians						
Agattu I.	---	---	---	---	907	1,127
Buldir I.	1,142	---	---	---	460	381
Central Aleutians						
Kiska I. (Lief Cove)	---	---	882+	---	293	221
Ayugadak I.	---	---	329	---	---	163
Ulak I.	---	---	1,236	---	---	790
Tag I.	---	---	703	---	---	352
Gramp Rock	---	---	909	---	---	448
Adak I.	---	---	558	---	---	137
Kasatochi I.	---	---	892	---	---	178
Agligadak I.	---	---	>30	---	---	0
Seguam I.	2,475	---	2,635	---	529	684
Yunaska I.	---	---	1,026	---	---	230
Eastern Aleutians						
Adugak I.	---	---	844	---	---	262
Ogchul I.	---	---	172	---	---	---
Bogoslof I.	914	---	1,109	---	358	461
Akutan I.	---	---	1,130	---	---	442
Akun I.	---	---	60	---	---	63
Ugamak I.	---	---	1,635	1,386	---	851
Western Gulf						
Clubbing Rocks	1,419	1,394	---	---	---	---
Pinnacle Rocks	2,013	2,748	---	---	---	---
Chernabura I.	646	200	---	379	---	200
Atkins I.	4,538	2,093	---	1,072	---	433
Central Gulf						
Chowiet I.	5,485	3,207	---	1,731	820	344
Chirikof I.	1,649	1,913	---	1,476	709	607
Marmot I.	6,741	5,751	---	4,381	2,199	---
Sugarloaf I.	5,123	3,114	---	3,077	2,109	1,638
Outer I.	---	---	---	993	557	363

[1] Dashes indicate that no count was made

Table 7. Comparison of counts and percent declines of adult and juvenile Steller sea lions in the central and western Gulf of Alaska and eastern and central Aleutian Islands based on data from all sites counted (and Table 5) and 77 trend sites (from Merrick et al., 1991)[1].

	All Sites		Trend Sites		
YEAR(S)	Number	% Decline	Number	% Decline	Percent of Total on Trend Sites
1956-1959	140,115	--	105,289	--	75
1975-1977	103,976	26	89,100	15	86
1985	67,617	52	55,402	47	83
1989	24,953	82	23,030	78	92
1990	27,860	80	22,754	78	82

[1] Percent declines are calculated from the earlier survey period

Table 8. Counts of Steller sea lions in the eastern Gulf of Alaska, 1976-1991 (ADFG, unpubl. data)[1].

	Location		
	Seal Rocks		Cape St. Elias
YEAR	non-pups	pups	non-pups
1976	1,709	316+	1,628
1978	2,463	545	-----
1979	2,961	491	-----
1984	-----	799	-----
1989	2,159	553	1,883
1990	1,471	571	948
1991	1,220	657	744

[1] Dashes indicate that no count was made

Table 9. Counts of Steller sea lions at rookeries in southeast Alaska, 1979-1991 (ADFG, unpubl. data)[1].

	Location					
	Forrester Island		Hazy Islands		White Sisters	
YEAR	non-pups	pups	non-pups	pups	non-pups	pups
1979	3,121	2,187	893	30	761	3
1982	3,777	2,227	1,268	--	934	--
1989	4,648	2,844	1,462	--	734	--
1990	3,324	2,932	1,187	641	980	30+
1991	3,648	3,261	1,278	808	860	95

[1] Dashes indicate that no count was made

Table 10. Summer aerial counts of Steller sea lions at major rookeries in Oregon, 1975-1989 (from Brown, 1990)[1].

	Location			
	Rogue Reef		Orford Reef	
YEAR	non-pups	pups	non-pups	pups
1975	802	---	716	---
1976	800	---	341	---
1977	815	---	371	---
1978	859	---	677	---
1979	---	---	689	---
1980	914	---	482	---
1981	810	---	736	---
1982	1,389	---	754	---
1983	958	---	603	---
1984	754	340	650	65
1985	1,174	344	559	85
1986	1,230	296	896	---
1987	1,194	200	929	89
1988	1,381	349	691	159
1989	1,001	407	446	181
1990	1,229	463	766	111

[1] Dashes indicate that no count was made

Table 11. Summer counts of adult and juvenile Steller sea lions at major rookeries in California, 1927-1989 (from Bonnott and Ripley, 1948; Bonnel et al., 1983; Pearson, 1987; R. Gisiner, D. Ainley, R. Brown, and B. LeBoeuf, pers. communications)[1].

	Location				
YEAR	San Miguel	Año Nuevo	Farallons	Mendocino	Gt. George
1927	595	1,500	700	700	1,500
1947	950	2,050	750	625	200
1958	37	1,170	941	---	---
1976	10	1,497	200?	---	---
1980	0	1,031	120	859	173
1985	0	1,169	100?	---	---
1990	0	458	<100	800[2]	674

[1] Dashes indicate that no count was made

[2] Estimate derived from May 1989 count of 286 animals

6. FIGURES

Figure 1. Map of the North Pacific Ocean showing the general range of Steller sea lions (stippled area) and the location of major rookeries (arrows).

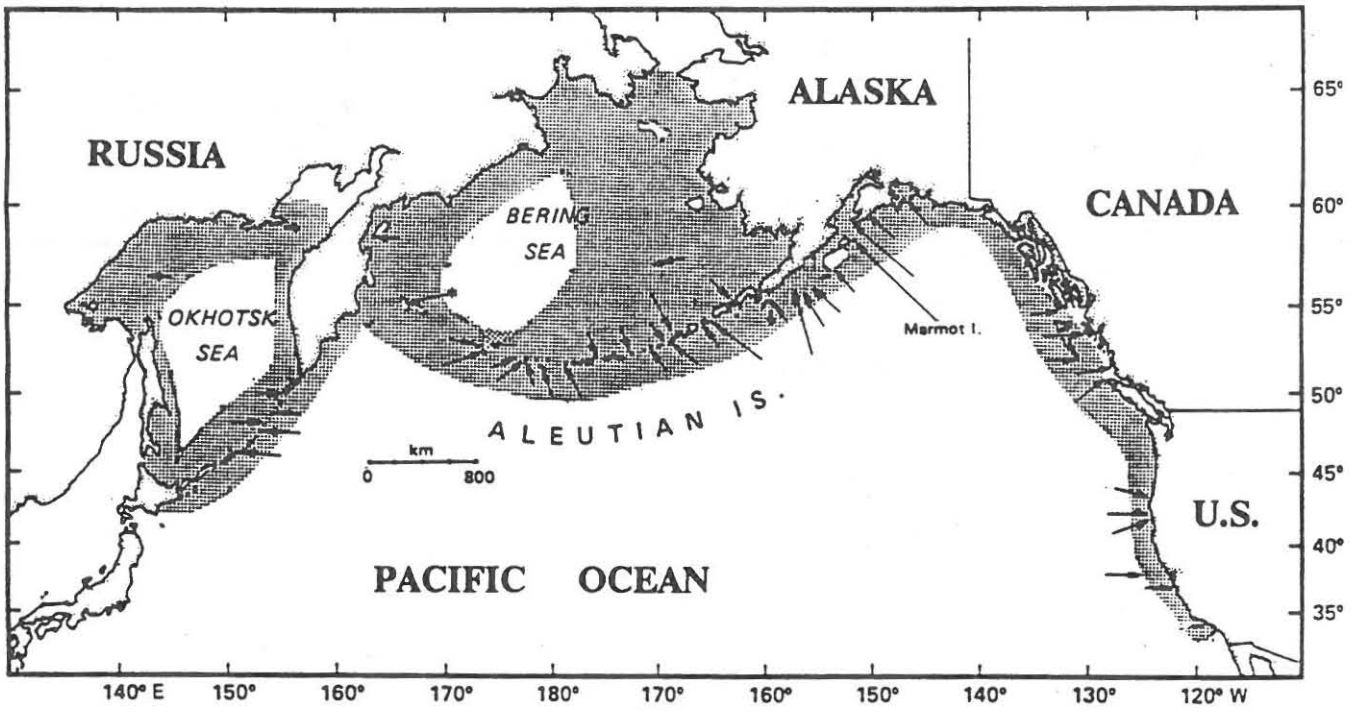


Figure 3. Locations of Steller sea lion rookeries and major haulouts in the Kuril Islands and Okhotsk Sea.

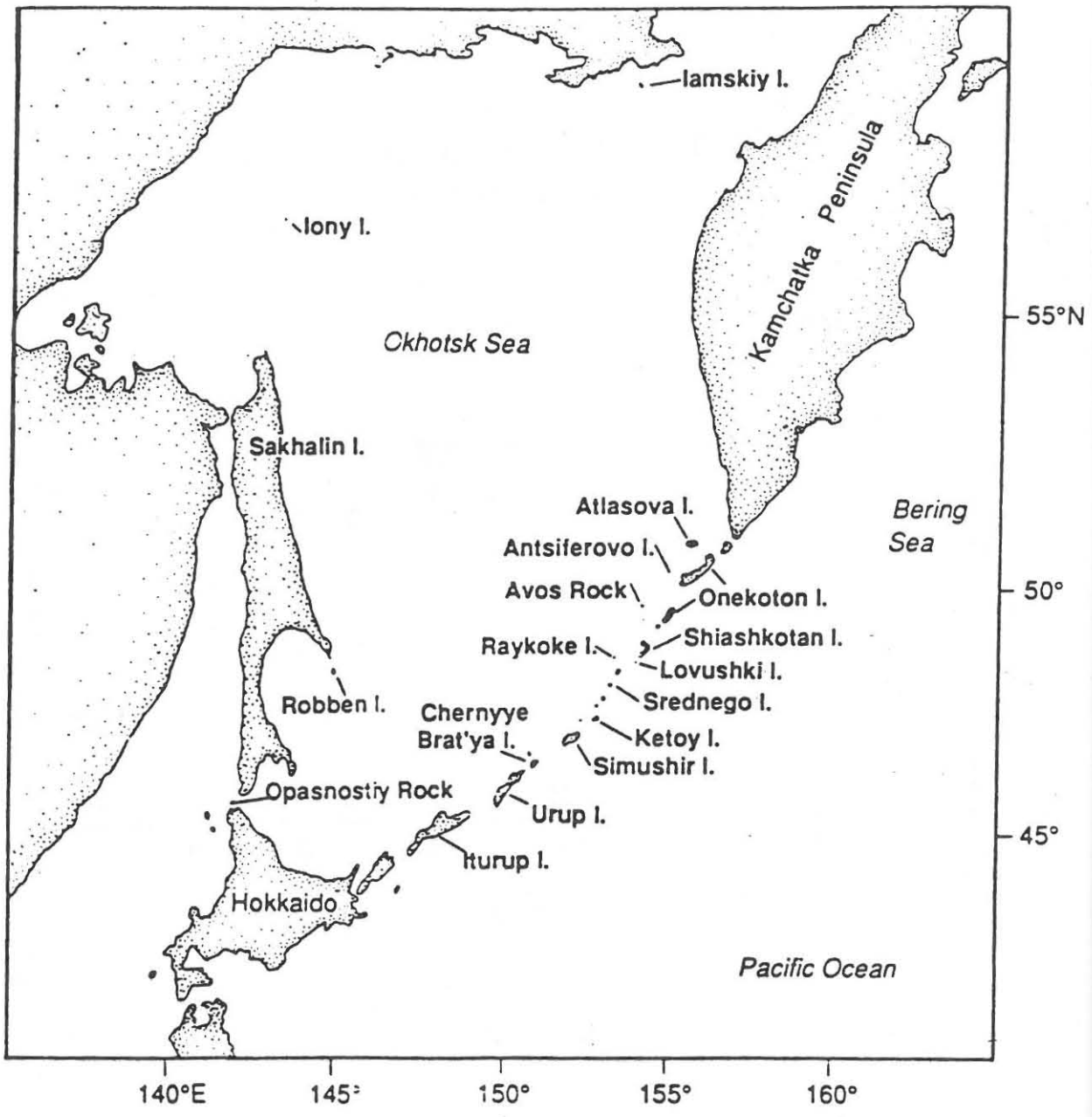


Figure 4. Locations of Steller sea lion rookeries on Kamachatka and the Commander Islands.

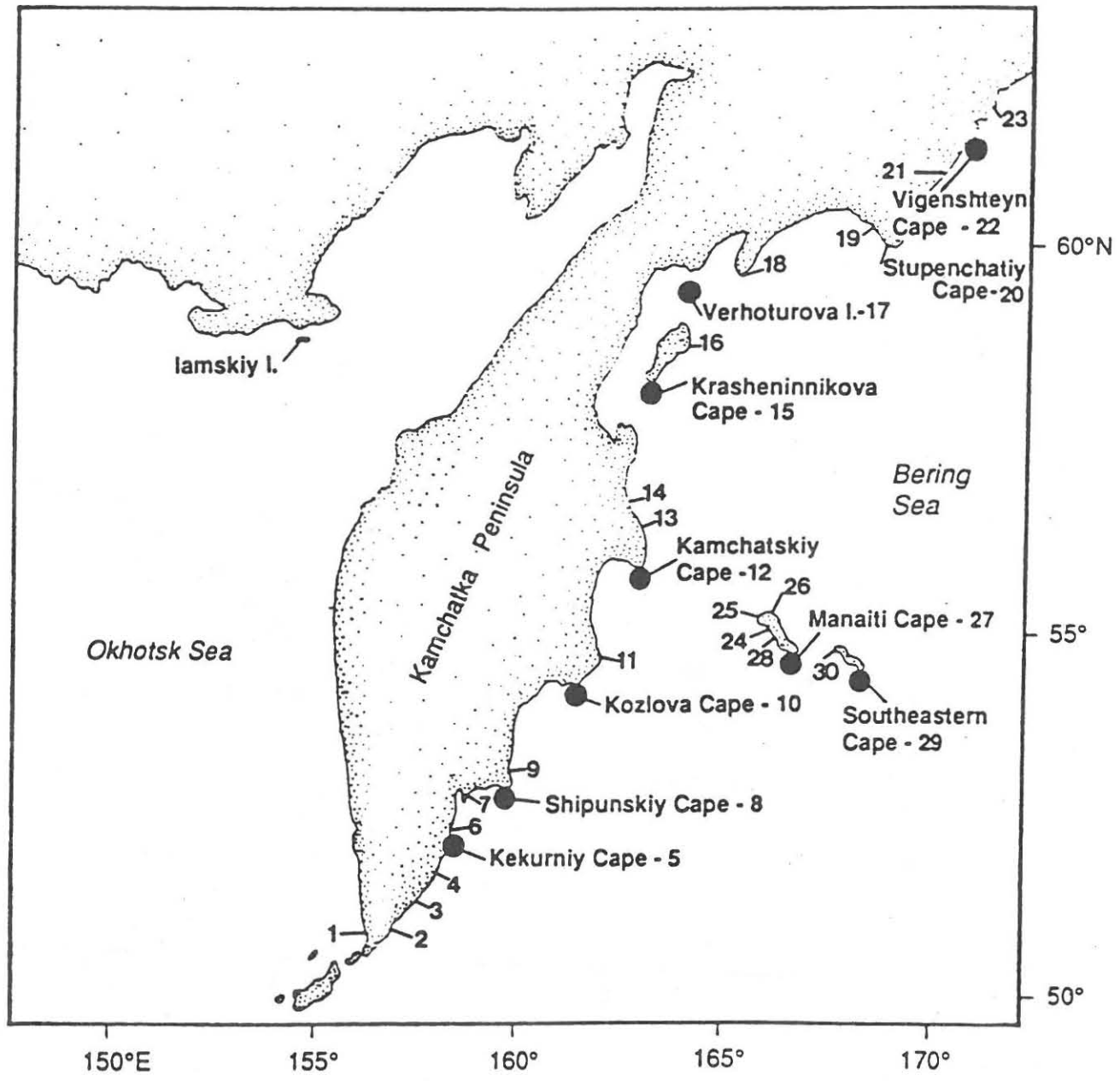


Figure 5. Locations of Steller sea lion rookeries in the Aleutian Islands and Bering Sea.

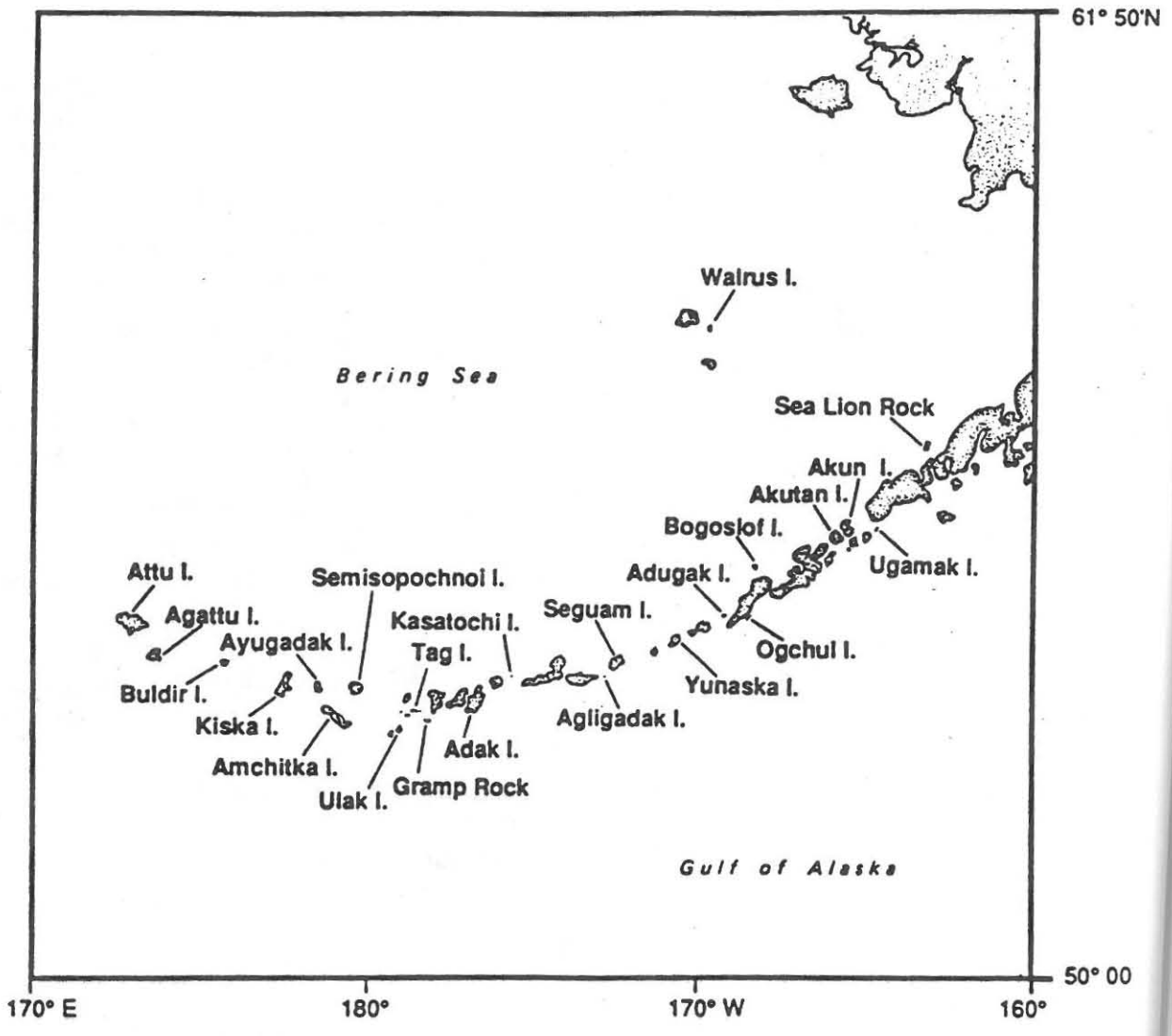


Figure 6. Locations of Steller sea lion rookeries in the Gulf of Alaska and southeast Alaska.

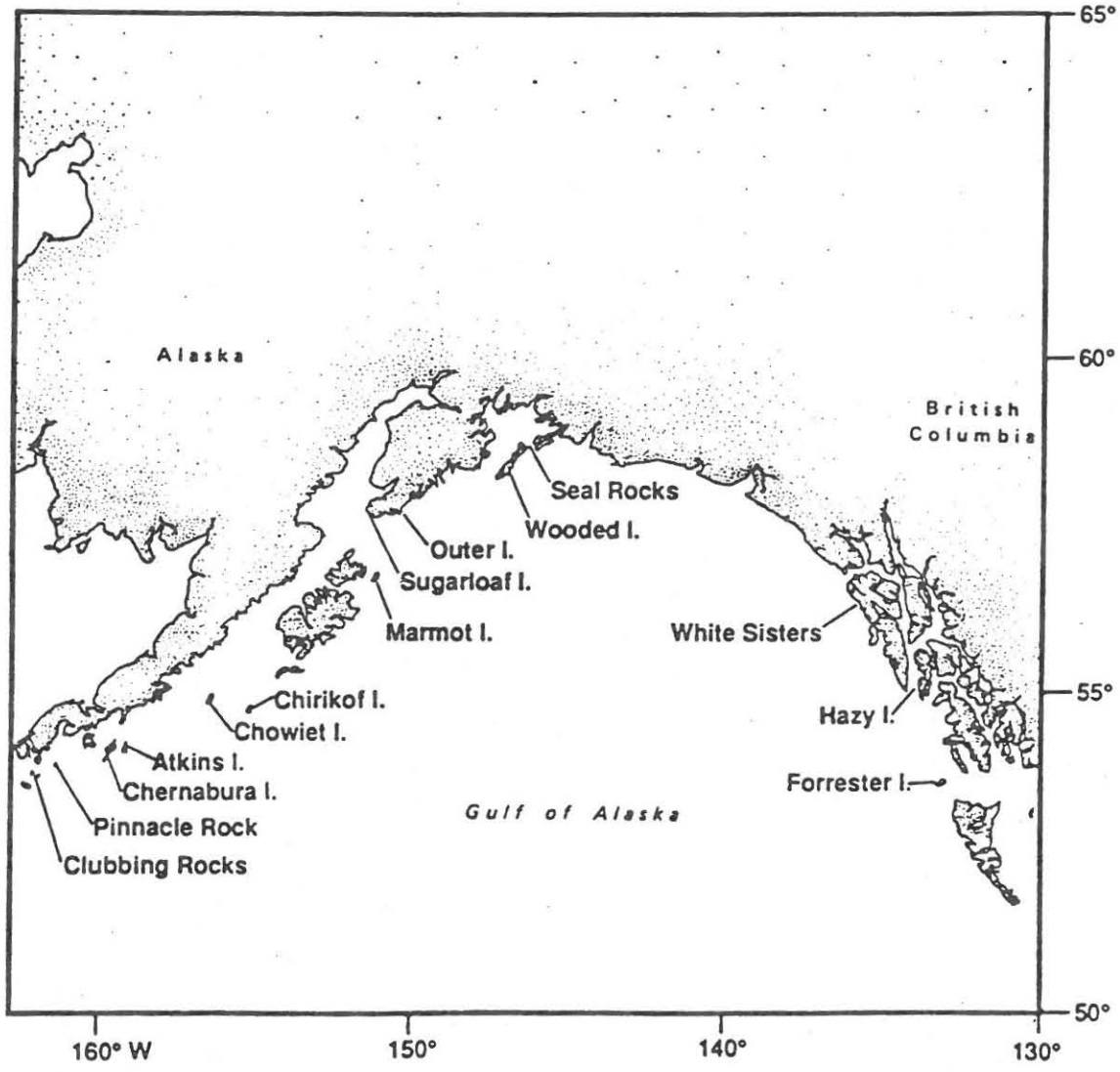


Figure 7. Locations of Steller sea lion rookeries and major haulouts in British Columbia.

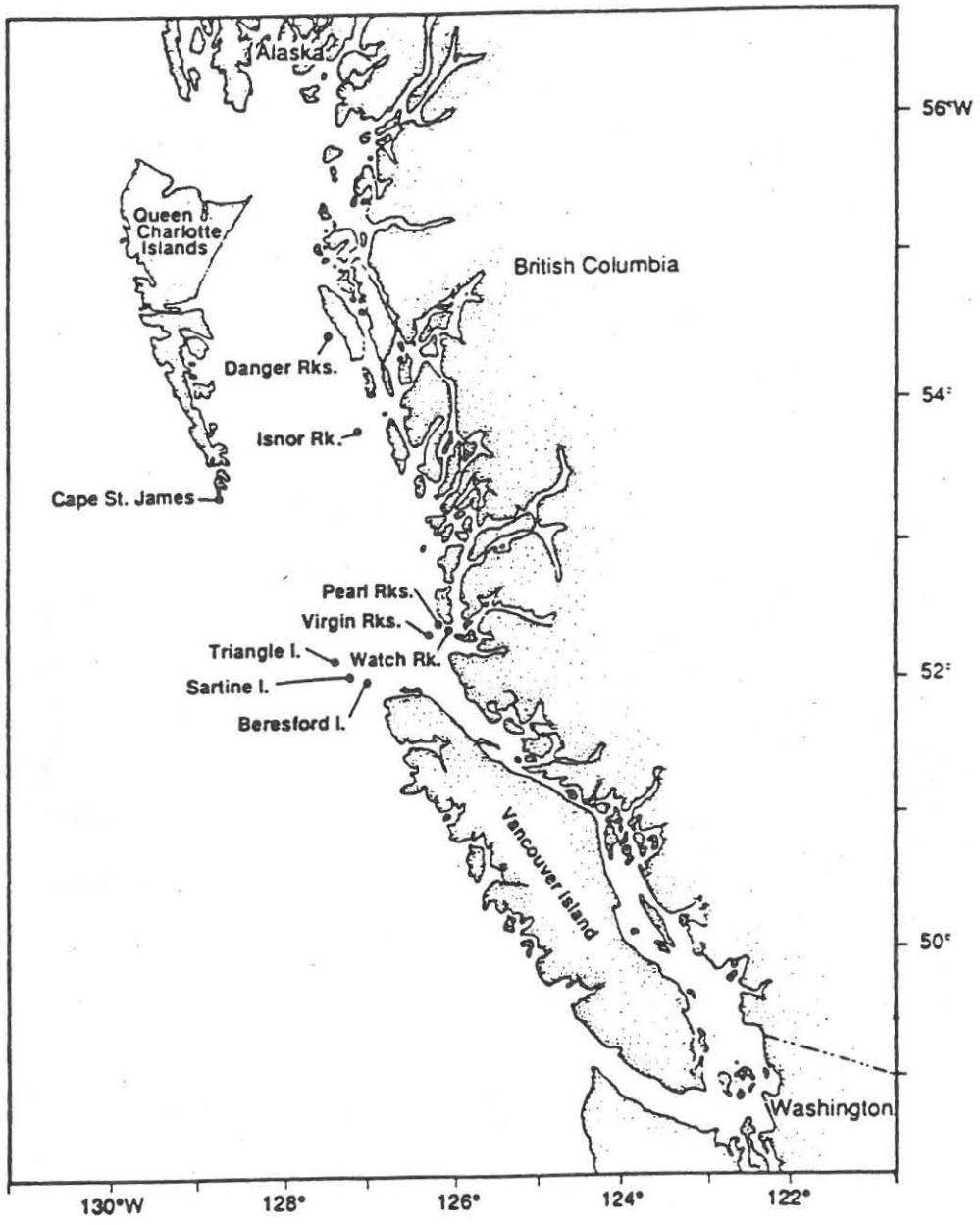
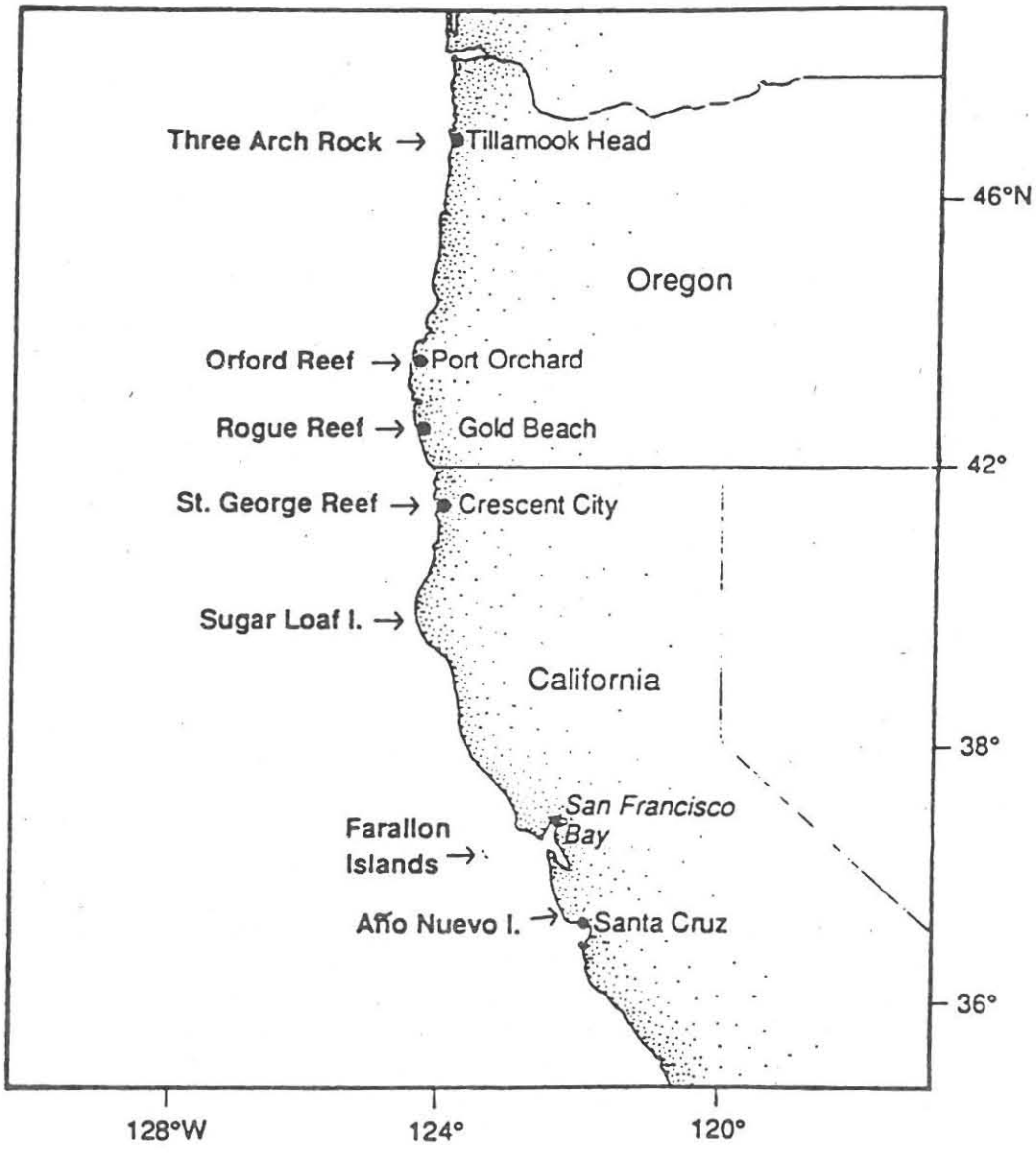


Figure 8. Locations of Steller sea lion rookeries and major haulouts in Oregon and California



PART II

1. RECOVERY ACTIONS AND IMPLEMENTATION

A. Goal and Objectives

The overall goal of this Recovery Plan is to promote recovery of the Steller sea lion population to a level appropriate to justify removal from ESA listings. The primary purpose of the Plan is to propose a set of actions that will minimize any human-induced activities that may be detrimental to the survival or recovery of the population. Immediate objectives are to identify factors that are limiting the population, actions necessary to stop the population decline, and actions necessary to allow the population to increase.

B. Reclassification Criteria for Evaluating Population Status of the Steller Sea Lion

The Recovery Team recommended that reclassification and delisting should consider the following criteria:

(1) Counts and trend in counts of Steller sea lions older than pups (called Adult/Juvenile Trend Count) on rookeries and haulouts in the region from the Kenai Peninsula to Kiska Island (hereafter referred to as the Kenai-Kiska area)(a suggested list of index sites to be included is presented in Appendix A);

(2) counts and trend in counts of pups at index sites within the Kenai-Kiska area (called pup production index)(sites to be included are indicated in Appendix B); and

(3) the status and trend of sea lions in other parts of the species' range.

The Recovery Team further recommended that delisting and reclassification under criterion (1) should consider the current population index in relation to the long-term ability of the Kenai-Kiska area to support Steller sea lions. The Recovery Team recommended that a benchmark figure, representing an estimate of the equilibrium population for the region, should be established and be reassessed, and changed if necessary, as new information becomes available. The Recovery Team recommended an initial benchmark of 90,000 animals older than pups counted on trend sites in the Kenai-Kiska area during the peak of the breeding season (late May-early July). This number is equivalent to the trend site count of animals older than pups in the mid 1970s (89,100) (see Table 7). While a higher trend site count (105,289) resulted from data collected in the late 1950s, the Recovery Team does not believe that is an appropriate benchmark figure. The earlier counts were performed by nonstandard techniques and were so widely spaced in time that it is difficult to use the data to estimate the overall number of animals in the Kenai-Kiska area. Furthermore, pup counts, which provide independent verification of population size and trend, were not conducted prior to the mid 1970s.

It is difficult to propose specific measures by which the status and trend of Steller sea lions in areas other than the Kenai-Kiska region can be evaluated. Existing data sets are of variable quality and completeness, and future research plans are uncertain. The Recovery Team

recommended that the evaluation of population status should be based on relatively large regions representing logical geographical units, and each should include several rookeries and contain generally comparable numbers of animals. The regions initially recommended were: (1) Russia, (2) the western Aleutians, (3) eastern Gulf of Alaska, (4) southeast Alaska, (5) British Columbia, and (6) California-Oregon-Washington. The designation of regions should be revised, if necessary, based on results of studies to define biological subspecies or stocks.

C. Application of Evaluation Criteria

The Recovery Team suggested that an objective evaluation of whether and how Steller sea lions should be listed under provisions of the ESA can be made by comparing the most recent data available with the measurable criteria described in the previous section.

The Recovery Team recommended that evaluation criteria should be applied as follows:

(1) if the current Adult/Juvenile Trend Count in the Kenai-Kiska area is less than 17 percent of the benchmark value, the species should be listed as **endangered**;

(2) if the current Adult/Juvenile Trend Count in the Kenai-Kiska area is greater than 17 percent but less than 40 percent of the benchmark value, the species should be listed as **threatened**, except;

(3) if the current Adult/Juvenile Trend Count in the Kenai-Kiska area is greater than 17 percent but less than 25 percent of the benchmark value the species should be listed as **endangered** if one or more of the following situations exists:

(a) The Kenai-Kiska Adult/Juvenile Trend Count has declined by at least 10 percent over 3 or more consecutive survey years,

(b) the overall Pup Production Index (count data combined in 2 year blocks) in the Kenai-Kiska area has declined by 10 percent over the count in the previous 2-year block,

(c) the number of animals has declined by at least 10 percent over a three-year period since 1989 in three or more of the six other regions (Russia, western Aleutians, eastern Gulf of Alaska, southeast Alaska, British Columbia, and California-Oregon-Washington).

It is the intent of NMFS to support the recovery activities outlined in the Recovery Plan. However, concerns associated with the proposed evaluation criteria regarding the quantitative measures for changing status under the ESA require further analysis and discussion. Thus NMFS will not implement Part II, Section 1.C, of the draft recovery plan at this time. NMFS believes that the strategy in this section focuses on small, short-term changes (e.g., in II.1.C(3), a 10 percent decline over 3 years) but neglects an analysis of long-term trends and the effects of stochastic variability. NMFS supports and will evaluate a combination of techniques, like population viability analysis and analysis of data on historical trends, to provide a more robust estimation of the likelihood of extinction. At the conclusion of these analyses, NMFS will reconsider the threshold

levels proposed by the Recovery Team, as well as other criteria which emerge as part of the analytical procedure. A final set of criteria will then be established and implemented.

D. Delisting Criteria

Section 4 of the ESA requires that an objective, measureable criteria be incorporated into each Recovery Plan which, when met, would result in a determination that the species be removed from the list. The data currently available on Steller sea lion relative abundance and trend come from aerial photographic surveys of adults and juveniles and land-based counts of pups (see section II.E.3). Preliminary simulation studies conducted at the April 1992 workshop indicate that the confidence interval around the recent aerial estimates of adult and juvenile numbers of sea lions is quite small; therefore, for the present, NMFS will adopt the delisting criteria proposed by the Recovery Team as follows:

> (1) If the current Adult/Juvenile Trend Count in the Kenai-Kiska area is greater than 40 percent of the benchmark value of 90,000 animals older than pups, and
>
> (2) the number of animals is stable or increasing in at least three of the six other regions described in section II.B,
>
> then **delist** the species.

Using such a system, a benchmark population of 90,000 and these criteria, delisting would not occur until the Adult/Juvenile Trend Count reached 36,000. However, these criteria will be evaluated as part of the risk analysis to determine their adequacy for long-term protection of the species.

Appendix B

Listing of Steller (northern) sea lions as Threatened under the Endangered Species Act

federal register

Monday
November 26, 1990

Part III

Department of Commerce

National Oceanic and Atmospheric Administration

50 CFR Part 227

Listing of Steller Sea Lions as Threatened Under the Endangered Species Act; Final Rule

DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
50 CFR Part 227
[Docket No. 900387-0292]
RIN 0648-AB13

Listing of Steller Sea Lions as Threatened Under the Endangered Species Act

AGENCY: National Marine Fisheries Service (NMFS), NOAA, Commerce.

ACTION: Final rule.

SUMMARY: NMFS is listing the Steller (northern) sea lion (*Eumetopias jubatus*) throughout its range as threatened under the Endangered Species Act of 1973, 16 U.S.C. 1531 *et seq.* (ESA) and is establishing protective measures similar to those contained in the previous emergency rule (April 5, 1990; 55 FR 12845). More comprehensive protective regulations and critical habitat designation are being considered in a separate, forthcoming rulemaking. NMFS adopted this dual rulemaking approach in order to expedite the final listing of the Steller sea lion. This listing decision is based on review and analysis of comments on the proposed listing (July 20, 1990; 55 FR 29793) and at public hearings. It is being taken because of significant declines in the Steller sea lion population. The number of Steller sea lions observed on certain rookeries in Alaska has declined by 63% since 1985 and by 82% since 1960. Declines are occurring in previously stable areas. Significant declines have also occurred on the Kuril Islands, USSR.

EFFECTIVE DATES: December 4, 1990.

ADDRESSES: The complete file for this rule is available for review at the Office of Protected Resources and Habitat Programs (F/PR) NMFS, 1335 East-West Highway, Silver Spring, MD 20910.

FOR FURTHER INFORMATION CONTACT: Mr. Herbert Kaufman, Protected Species Management Division, Silver Spring, MD, 301-427-2319.

SUPPLEMENTARY INFORMATION:

Background

On November 21, 1989, the Environmental Defense Fund and 17 other environmental organizations petitioned NMFS to publish an emergency rule listing the Steller sea lion as an endangered species and to initiate a rulemaking to make the listing permanent. Under section 4 of the ESA, NMFS determined that the petition presented substantial information indicating the action may be warranted and requested comments (February 22, 1990; 55 FR 6301). On April 5, 1990 (55 FR 12845), NMFS issued an emergency interim rule listing the Steller sea lion as threatened and requested comments. The emergency listing is effective for 240 days and expires on December 3, 1990.

In March 1990, NMFS appointed a Steller sea lion recovery team, which held its first meeting on April 27, 1990. The team is responsible for drafting a recovery plan and providing recommendations to NMFS on necessary protective regulations for the Steller sea lion.

NMFS also is conducting several research projects, including populations surveys, assessment of sea lion health and fitness, a stock identification study, analysis of fisheries data, and blood and tissue analyses.

NMFS proposed listing the Steller sea lion as a threatened species under the ESA on July 20, 1990 (55 FR 29793). The proposed rule contained protective regulation similar to those of the emergency rule. On July 20, 1990, NMFS also issued an advanced notice of purposed rulemaking (55 FR 29792), requesting public comments to assist NMFS in its efforts to develop separate, more comprehensive protective regulations and critical habitat designation.

NMFS has taken this dual-track rulemaking approach because it wants to avoid a lapse between the expiration of the emergency interim listing and the final listing. There is not sufficient time to issue a proposed rule with comprehensive protective regulations including a proposed critical habitat designation, solicit public comments, provide an opportunity for public hearings, conduct the required regulatory and economic analyses, and issue a final rule by December 3, 1990. Further, NMFS believes it is preferable to consider the information provided in the recovery plan prior to publishing comprehensive proposed protective regulations. Therefore, the Service is listing the Steller sea lion as a threatened species now with a limited set of protective measures and will propose more comprehensive protective regulations and critical habitat in a separate rulemaking.

Comments on the Proposed Rule

NMFS received 13 comments in response to the July 20, 1990 notice of proposed rulemaking: Four comments were received from environmental groups, four comments were received from state and local governments, two comments were received from Native Alaskan interest groups, one comment was received from a fishing industry group, one comment was received from a private individual, and one comment was received from the Steller Sea Lion Recovery Team. Additional comments were received at public hearings held in Anchorage, Cordova, and Kodiak, Alaska. These comments, which are discussed below, address the following issues: Listing classification, buffer zones, incidental take, shooting prohibition, subsistence, enforcement, exceptions, additional protective measures, research/experimentation, and public hearings.

Listing Classification

Nearly half the commenters addressed the listing classification issue. Several commenters believed that the species should be listed as endangered rather than threatened based on the dramatic and continuing declines in abundance in Alaska. One commenter noted that the Alaska population of Steller sea lions declined by 86 percent over the last 29 years and 63 percent in the last 5 years. This commenter added that the evidence indicates that the decline is continuing and accelerating, resulting in extinction in several years. Another commenter stated that the most recent population data show that the geographic extent of the decline is increasing as well.

NMFS believes that a population decline is a sufficient basis for listing a species as threatened or endangered. In the case of the Steller sea lion, NMFS believes that the available information supports a threatened classification rather than an endangered classification. There is not sufficient information to consider animals in different geographic regions as separate populations; therefore the status of the entire species must be considered.

Total counts of sea lions at rookeries and haulout sites throughout most of Alaska and the USSR in 1989 were about 56,000, indicating a total population size in this area of at least one third more than this number. There are areas where Steller sea lion abundance is stable or not declining significantly. Furthermore, preliminary results from the 1990 Steller sea lion survey show that about 25,000 adult and juvenile sea lions were counted, similar to the 1989 count. These results indicate that the population has not declined further in areas where the decline had been significant, and that the 1989 counts were not anomalous. NMFS does not believe that the species currently is in danger of extinction throughout all or a significant portion of its range (i.e., endangered). NMFS will continue to monitor the Steller sea lion population. If the decline continues at the rate in the past decade and continues to spread,

NMFS will reconsider the listing classification.

Two commenters concurred with the "threatened" listing but stated that this classification should be extended to the entire range of the species, including California populations of the Steller sea lion. One of these commenters referred to the comment on the emergency listing that documented a decline of 90 percent in the species' population in California.

The emergency interim rule applied to the entire range of the Steller sea lion, as does the final rule. Although the California populations are included, specific protective measures for Steller sea lions in California (such as buffer areas) are not. NMFS and the Recovery Team are reviewing the status of the species throughout its range and the need for additional protective measures. In a separate rulemaking, NMFS will propose more comprehensive protective regulations and critical habitat.

One commenter expressed concern about classifying the Steller sea lion as threatened before identifying the reason for the population decline. The commenter suggested that NMFS conduct additional research on the probable causes of the decline prior to reclassification of the species.

The available data support a listing of threatened throughout the range of the Steller sea lion. NMFS believes that a demonstrated decline can justify a listing of species and that precise knowledge of the reasons for the decline is not a prerequisite. Each of the five factors described in section 4(a)(1) of the ESA, which can cause a species to be threatened or endangered, is discussed in detail below. NMFS has determined that the Steller sea lion is a threatened species and that it is likely that this condition is caused by a combination of the factors specified under section 4(a)(1) of the ESA. NMFS is sponsoring research projects to determine the cause of the population decline. The results of this research will be considered when NMFS proposes comprehensive protective regulations and critical habitat designation.

Buffer Zones

NMFS received eight comments on buffer zones. One commenter concurred with the list of the buffer zones designated in the proposed rule. Six commenters indicated that the buffer zones should be designated in other areas not covered in the emergency rule. Two of these commenters stated that buffer zones should be established around all rookeries in the species' range and that the size should be increased to include surrounding feeding areas (i.e., up to 60 miles (96.6 kilometers) from a rookery). One of these commenters also stated that NMFS should prohibit overflights over all buffer zones. Two other commenters requested that buffer zones be established around major rookeries off the California coast, including Farallon Island National Wildlife Refuge and Ano Nuevo Island. The last two commenters recommended that additional rookeries, not yet showing population declines, be protected by 0.5-nautical mile (0.9 kilometers) buffer zones. One of these commenters recommended that NMFS consider issuing prohibitions or guidelines on aircraft activity near rookeries. Of the six commenters that supported strengthening of the buffer zone provisions, two commenters stated that buffer zones should be established for all haulouts. A third commenter wants NMFS to establish buffer zones for haulouts when Steller sea lions are on them.

NMFS believes that additional buffer zones may be needed to provide adequate protection to the Steller sea lion until more comprehensive regulations are in place. Because the area of major decline continues westward beyond Kiska Island, and includes sea lion rookeries on Buldir, Agattu, and Attu Islands, NMFS adds rookeries located on those islands to the list of locations where 3 mile (4.8 kilometers) (at-sea and 0.5 mile (0.8 kilometers) on-land buffer zones are in effect. Additional modifications to the buffer zone provisions will be considered when NMFS proposes more comprehensive protective regulations and critical habitat after considering the recommendations of the Recovery Team, the Marine Mammal Commission and the public.

One commenter requested that NMFS reduce the size of the buffer zone on Adak Island. This commenter claimed that the rookery is smaller than listed and that small vessels do not have an adverse impact on Steller sea lions even at 1 nautical mile (1.8 kilometers).

The NMFS believes keeping the three nautical mile (5.5 kilometers) buffer zone around the rookery on Adak Island will be necessary to provide protection to the Steller sea lion without having significant effects on marine user groups. If current research indicates that modifications to the listed buffer zones are warranted, NMFS will implement such changes. Individuals may obtain exemptions where an "activity will not have any significant adverse affect on Steller sea lions, the activity has been conducted historically or traditionally in the buffer zones, and there is no readily available or acceptable alternative to or site for the activity."

Incidental Takings

Five commenters recommended that the incidental take quota be reduced. Two of the commenters stated that the quota should be based on biological considerations and suggested that the quota be set at 1 percent of the index count of Steller sea lions (not including pups) in a region. One of these commenters recommended that this formula also apply to Alaskan waters east of 141° W longitude and to waters off of Washington, Oregon, and California, regions not covered by the proposed rule. Another commenter, noting that the proposed quota was more than 2.5 times higher than the worst-case estimate of the actual incidental take, stated that the proposed quota was meaningless and should be reduced. This commenter added that the incidental take in non-fishing activities (e.g., oil exploration) should be prohibited. One commenter stated that the incidental take quota should be reduced to zero, that the quota should be apportioned geographically, and that the quota should take into account the age and sex structures of the takes. Two of the commenters suggested that NMFS investigate mechanisms to reduce the incidental take in fisheries.

NOAA scientists currently are evaluating methods for establishing and monitoring incidental take quotas for Steller sea lions. This effort is one component of the long-range management strategy that is anticipated to be implemented when the Marine Mammal Exemption Program expires in 1993. NMFS also will determine whether fishing practices or gear can be used to reduce or eliminate incidental takes associated with fishing. NMFS will address fishing gear and practices in the forthcoming rulemaking dealing with comprehensive protective regulations. As part of the rulemaking process for the comprehensive conservation program, NMFS will consider modifications of the quota including location, age and sex.

Shooting Prohibition

All five commenters that addressed the shooting prohibition concurred with NMFS's proposal. Two of the commenters, however, recommended that the prohibition be extended to harbor seals and California sea lions; one of the commenters recommended that the prohibiton be extended to harbor seals only. The commenters argue that the extension is necessary to prevent inadvertent shooting of Steller

sea lions because the three species are similar in appearance and often swim in the same areas. One of the commenters added that the prohibition would be easier to enforce if it were extended to the other two species.

NMFS agrees that the inadvertent shooting of Steller sea lions is a potential problem and will examine the extension of the shooting prohibition to California sea lions and harbor seals when it proposes comprehensive protective regulations.

One commenter stated that the regulatory language regarding the shooting prohibition was unclear, claiming that "within 100 yards" (91.4 meters) could be interpreted to mean either that the individual firing a weapon could not be within 100 yards (91.4 meters) of a Steller sea lion or that the projectile could land within 100 yards (91.4 meters) of a Steller sea lion.

NMFS believes that the intent of the regulatory language regarding the shooting prohibition is clear. To prevent misinterpretation of the regulation, NMFS issues the following clarification: 50 CFR 227.12(a)(1) prohibits the discharge of a firearm where the projectile will strike or land within 100 yards (91.4 meters) of a Steller sea lion. NMFS believes that this clarification is sufficient and that no change in the regulatory language is required.

Two commenters recommended that NMFS develop non-lethal deterrents and evaluate their effectiveness at reducing damage to fishing catch and gear and their possible impacts on animals.

NMFS agrees with the commenters that non-lethal deterrents should be developed for use by fishery vessel operators and crews. At this time, however, NMFS is not aware of any methods that have been proven to be effective at deterring marine mammals from interacting with fishing activities.

Subsistence

Five commenters addressed the taking of Steller sea lions for subsistence purposes. Two commenters stated that subsistence harvesting is a minimal contributor to the population decline of sea lions. One of these commenters expressed concern that the traditions and livelihood of Native Alaskans would be adversely affected if subsistence harvesting were regulated. One commenter disagreed with the subsistence exception in the proposed rule, recommending that the subsistence take be included in an overall quota that would include incidental takes and that NMFS regulate the subsistence harvest.

NMFS agrees that the subsistence harvest is minimal and probably has not contributed to the population decline of Steller sea lions. Although the actual level of the subsistence harvest is unknown, it is estimated to be fewer than 100 animals annually. Based on the available information NMFS believes that it would be more appropriate to address the regulation of subsistence harvesting when NMFS develops the comprehensive protective regulations.

One commenter expressed concern that the creation of buffer zones could threaten traditional subsistence harvest activities because a number of traditional harvest sites are located within the boundaries of buffer zones. This commenter noted that exemptions could be difficult to obtain and feared that the burden of proof would be placed on Alaskan Natives. The commenter recommends that NMFS establish clear criteria for providing for subsistence harvesting in buffer zones. In the long run, the commenter suggests that NMFS establish a more flexible regulatory structure that provides protection for Steller sea lions without placing undue restrictions on subsistence harvest activities.

NMFS recognizes the possible adverse impacts of the listing on traditional activities that are not contributing to the decline of Steller sea lions. This rule includes an exception to the shooting prohibition for subsistence harvesting and an exemption process for traditional activities in buffer zones. Conflicts between buffer zones and traditional hunting sites will be handled on a case-by-case basis through the exemption process. Because subsistence hunting is a traditional activity, hunters have to demonstrate that no alternative sites are readily available and that the hunting will not adversely affect the rookery. The regulation, however, does not include a blanket exemption for subsistence because NMFS believes that alternative hunting sites may be available in some cases and that it is necessary to minimize avoidable human contact at and near rookeries. NMFS will further consider the interrelationship between buffer zones and subsistence harvesting when it develops comprehensive protective regulations.

Another commenter concurred with the regulatory exception for subsistence harvesting but requested NMFS to examine the subsistence harvest and determine whether the harvest is being conducted in a non-wasteful manner.

NMFS agrees that subsistence harvesting of Steller sea lions should be conducted in a non-wasteful manner. Examination of this issue, however, could not be addressed in the final listing without delaying its publication.

Enforcement

Three commenters expressed concern that enforcement of the provisions in the emergency interim rule was inadequate. Two of these commenters specifically addressed enforcement of the shooting prohibition while the other commenter addressed incidental takes and enforcement of buffer zones. One commenter recommended that intentional kills should be a priority for the observer program. Another commenter suggested that NMFS expand the observer program for incidental takes.

NMFS agrees that enforcement is a critical component of these regulations and retains the expanded observer program established under the emergency listing. Foreign processors and domestic groundfish vessels 125 feet (38 meters) or more in length now carry observers during all of their operations in the Exclusive Economic Zone (EEZ) of the Bering Sea and in the Gulf of Alaska. Groundfish vessels of 60 to 124 feet (18 to 38 meters) in length carry observers during 30 percent of their operations in each quarter. Three additional fisheries in Alaska that are classified as Category I under the MMPA, Prince William Sound set and drift gillnet for salmon and South Unimak (Unimak and False Passes) drift gillnet for salmon, had observer coverage during the 1990 fishing season and are scheduled to have coverage in the 1991 fishing season contingent upon final publication of the Revised List of Fisheries. NMFS also is retaining the observer authority of the emergency rule by allowing the NMFS Alaska Regional Director to place an observer on any fishing vessel. If additional information indicates that the current observer program requires modification, such modification could be implemented under the authority of this rule. NMFS also is evaluating the observer program as part of the development of a long-range management strategy for implementation of the Marine Mammal Protection Act Amendments of 1988.

Exceptions

Three commenters addressed the exceptions provided under the proposed rule. One of these commenters stated that the criteria for several of the exceptions were vague and/or unjustified and that the lack of specificity could pose enforcement problems. The commenter expressed concern over the following exception provisions: Taking for the protection of the animal or public health or the non-lethal removal of a nuisance animal,

entrance into buffer zones by governmental agencies for national defense or the conduct of other legitimate activities, emergency situations, and exemptions. In addition, the commenter recommended that NMFS modify the exemption application procedure to include public comments, to place the burden of proof on the applicant, and increase the stringency of the adverse impact criterion from "will not have a *significant* adverse impact" to "will not have *any* adverse impact."

NMFS believes that the exceptions established in 50 CFR 227.12(b) paragraph (1) through (4) are appropriate, necessary, and well defined. The first provision parallels section 109(h) of the Marine Mammal Protection Act, 16 U.S.C. 1361 *et seq.* (MMPA), which, among other things, allows the taking of beached and stranded animals for rehabilitation purposes, an activity that may benefit the species. NMFS believes that local officials need the authority to protect the safety of their citizens when necessary. Only a very small number of animals are likely to be taken for the protection of the public health and welfare or by the non-lethal removal of "nuisance animals," and this provision is not likely to have any affect on the population. NMFS believes the second provision is necessary to allow government functions, such as Coast Guard activities, NOAA's nautical charting responsibilities and wildlife surveys, to continue. None of these activities is expected to significantly affect the sea lion population. Further, Federal agencies must consult under section 7(a)(2) of the ESA on any action that may affect Steller sea lions to ensure that the action is not likely to jeopardize its continued existence.

NMFS believes that the exemption criteria and process established by this rulemaking will adequately protect the designated rookeries. NMFS does not expect many exemptions and believes that exemptions are necessary to account for unforeseen circumstances. Furthermore, the criteria narrowly define conditions under which NMFS can grant an exemption. Since the emergency listing became effective on April 5, 1990, NMFS has acted on two exemption applications. In one case the exemption was granted because the applicant very clearly met all three criteria: The activity has been on-going since 1930, disturbance of the rookery has not been a problem, and there are no reasonable or feasible alternatives to the site. In the other case, in which a tourist lodge's application for entry into the Marmot Island buffer zone to view and photograph Steller sea lions was denied, NMFS ruled that alternative sites and alternative "wilderness experience" activities were available. These examples demonstrate that the exemption procedure is unlikely to reduce the protection afforded by the establishment of buffer zones.

Two commenters expressed concern that vessels would not have access to safe anchorages located in buffer zones during storms.

NMFS shares the commenters' concern that vessels have access to safe anchorage during storms. NMFS notes that both the proposed and final rules contain an exception to the buffer zone entry prohibition in case of emergency situations; 50 CFR 227.12(b)(4) states that approach restrictions into buffer zones does not apply when "compliance with that provision presents a threat to the health, safety, or life of a person or presents a significant threat to the vessel or property." The emergency situation provision would permit a vessel operator to enter a buffer zone for the purpose of securing the vessel at a safe anchorage during a storm.

Additional Protective Measures

Over half of the commenters believed that additional protective regulations are needed and that the interim protective measures under the emergency rule are inadequate. Most of these commenters implicated trawl fisheries as a major contributor to the decline in the Steller sea lion population by depleting the Steller sea lion's prey species. Additional recommendations included limiting trawling to daylight hours, prohibiting the use of gill nets around rookeries, prohibiting fishing for pollock when they are carrying roe, and reducing the overall quota of groundfish. One commenter added that the rapid decline in the Steller sea lion population required immediate action and that NMFS should develop an interim management and conservation plan in the absence of final comprehensive protective regulations.

NMFS agrees with the commenters that more comprehensive protective measures may be required. However, NMFS does not want to delay the listing of the species while proposed protective regulations are being developed and evaluated. NMFS will, therefore, propose more comprehensive protective regulations and critical habitat in a separate rulemaking as indicated in the preamble to the proposed rule. This rule includes the limited protective regulations specified in the proposed rule. NMFS, however, believes that these limited regulations (e.g., buffer zones, shooting prohibition) will be adequate in the near-term.

Research/Experimentation

Six commenters recommended that NMFS sponsor research to determine the cause of the Steller sea lion's population decline and to develop appropriate conservation measures and a management plan. Several of the commenters suggested that NMFS focus on the relationship between fishery practices and the Steller sea lion population. Another commenter supported research to assess the impact of toxic pollutants on the population decline. One commenter recommended that NMFS implement experimental conservation measures that test hypotheses on the causes of the population decline.

NMFS agrees that more information is needed to determine the cause(s) of the decline. NMFS is undertaking research to determine important feeding locations by using satellite monitored tags attached to female sea lions. These studies also should provide information on locations of at-sea mortalities. Studies to determine stock differentiation will continue. Resource surveys on the density of sea lion prey species are proposed. Satellite linked telemetry will be used to determine sea lion feeding areas for comparison to the findings from these surveys. The behavior of sea lions in relation to commercial fishing activities and the association between feeding sea lions and principal fishing areas will be examined. NMFS also will evaluate the impact of the protective measures (i.e., shooting prohibition, buffer zones) established by this rule.

Public Hearings

Two commenters requested that NMFS hold public hearings on the rulemaking. One of the commenters stated that public hearings were necessary because many affected individuals were unlikely to submit written comments in response to the publication of the proposed listing in the Federal Register. The other commenter indicated that public hearings were justified given the importance of fisheries to the local economy and the importance of the Steller sea lion to the community.

NMFS agreed with the commenters that the public hearings were appropriate given the importance of the rulemaking to the community. In response, NMFS held three public hearings: One on October 15, 1990 in Anchorage and, on October 16, 1990,

hearings were held in Kodiak and Cordova, Alaska.

Summary of the Status of the Species

The Steller (northern) sea lion, *Eumetopias jubatus*, ranges from Hokkaido, Japan, through the Kuril Islands and Okhotsk Sea, Aleutian Islands and central Bering Sea, Gulf of Alaska, southeast Alaska, and south to central California. There is not sufficient information to consider animals in different geographic regions as separate populations. The centers of abundance and distribution are the Gulf of Alaska and Aleutian Islands, respectively. Rookeries (breeding colonies) are found from the central Kuril Islands (46 °N latitude) to Ano Nuevo Island, California (37 °N latitude); most large rookeries are in the Gulf of Alaska and Aleutian Islands. More than 50 Steller sea lion rookeries and a greater number of haulout sites have been identified.

During the 1985 breeding season, 68,000 animals were counted on Alaska rookeries from Kenai Peninsula to Kiska Island, compared to 140,000 counted in 1956–60. A 1988 Status Report concluded that the population size in 1985 was probably below 50 percent of the historic population size in 1956–60 and below the lower bound of its optimum sustainable population level under the MMPA. A comparable survey conducted in 1989 showed that the number observed on rookeries from Kenai to Kiska declined to 25,000 animals. This indicates a decline of about 82 percent from 1956–60 to 1989 in this area. Preliminary results from the 1990 Steller sea lion survey show that about 25,000 adult and juvenile sea lions were counted, similar to the 1989 count. These results indicate that the population has not declined further in areas where the decline had been significant, and that the 1989 counts were not anomalous. The counts are not an estimate of total numbers of animals but include only those animals on the beach (excluding pups) at the time of the survey. As such, they can be used to indicate trends in abundance, rather than to estimate total species abundance. Copies of the 1988 Status Report and a 1989 Update are available (see **ADDRESSES**).

Species abundance estimates during the late 1970's ranged from 245–290,000 adult and juvenile animals. A current total population estimate is not available. However, counts at rookeries and haulout sites throughout most of Alaska and the USSR in 1989, plus estimates from surveys conducted in recent years at locations not counted in 1989, provide a minimum number for the species during 1989. The summaries of these counts and estimates are:

Alaska	53,000
WA, OR and CA	4,000
British Columbia	6,000
USSR	3,000
	66,000

Summary of Factors Affecting the Species

An endangered species is any species in danger of extinction throughout all or a significant portion of its range and a threatened species is any species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Species may be determined to be endangered or threatened due to one or more of the five factors described in section 4(a)(1) of the ESA. These factors as they apply to Steller sea lions are discussed below.

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* Steller sea lions breed on islands in the North Pacific Ocean, generally far from human habitations. There is no evidence that the availability of rookery space is a limiting factor for this species. As the number of animals continues to decline, rookeries are being abandoned and available rookery space is increasing. However, activities that result in disturbance, prey availability or other factors may be affecting the suitability of the available habitat.

The feeding habitat of Steller sea lions in Alaska may have changed. State of Alaska biologists found that populations in the Gulf of Alaska during the 1980's had slower growth rates, poorer physical fitness (lower weights, smaller girth), and lowered birth rates. Some data show a high negative correlation between the amount of walleye pollock caught and sea lion abundance trends in the eastern Aleutians and central Gulf of Alaska. It is possible that a reduction in availability of pollock, the most important prey species in most areas, is a contributing factor in the decline in the number of Steller sea lions in western and central Alaska.

B. *Over-utilization for commercial, recreational, scientific, or educational purposes.* Between 1963–72, over 45,000 Steller sea lion pups were commercially harvested in the eastern Aleutian Islands and Gulf of Alaska. This harvest may explain the declines in these areas through the 1970's. The actual level of subsistence harvest of Steller sea lions is unknown, but is probably less than 100 animals annually, primarily at St. Paul Island in the Pribilofs during fall and winter months. This taking is not of sufficient magnitude to contribute to the overall decline. A small number have also been taken for public display and scientific research purposes.

C. *Disease or predation.* Sharks, killer whales and brown bears are known to prey on Steller sea lion pups. Mortality from sharks and bears is not believed to be significant. When sea lion abundance was high, the level of mortality from killer whales was probably not significant, but as sea lion numbers decline, this mortality may exacerbate the decline in certain areas.

Disease resulting in reproductive failure or death could be a source of increased mortality in Steller sea lion populations, but it probably does not explain the massive declines in numbers. Antibodies to two types of pathological bacteria (*Leptospira* and *Chlamydia*), a marine calicivirus (San Miguel Sea Lion Virus), and seal herpesvirus were found in the blood of Steller sea lions in Alaska. Leptospires and San Miguel sea lion viruses may be associated with reproductive failures and deaths in California sea lions and North Pacific fur seals. *Chlamydia* has not been studied previously in sea lions, but is known from studies of Pribilof Island fur seals. None of these agents is thought to be a significant cause of mortality in Steller sea lions.

D. *The inadequacy of existing regulatory mechanisms.* Some protection for the Steller sea lion is provided under the MMPA, which prohibits the taking of Steller sea lions, with certain exceptions, including an interim exemption for commercial fishing. Once 1,350 Steller sea lions have been killed incidental to commercial fishing, section 114 of the MMPA requires NMFS to prescribe emergency regulations to prevent, to the maximum extent practicable, any further taking. Intentional lethal takes are prohbited. In addition, section 114(g) of the MMPA provides that regulations may be prescribed to prevent taking of a marine mammal species in a commercial fishery if it is determined that such taking is having, or is likely to have, a significant adverse impact on that marine mammal population stock.

E. *Other natural or manmade factors affecting its continued existence.* Steller sea lions are taken incidental to commercial fishing operations in the Gulf of Alaska and the Bering Sea. Between 1973 and 1988, U.S. observers on foreign and joint venture vessels operating in these areas reported 3,661 marine mammals taken. Steller sea lions accounted for 90 percent of this observed total. Based on these observed takes and an extrapolation to unobserved fishing, the total number of Steller sea lions incidentally killed by

the foreign and joint venture commercial trawl fisheries during 1973–1988 is estimated at 14,000. Since 1985, however, the level and rate of observed incidental take has decreased to the point where, by itself, it is not sufficient to account for the most recently observed declines.

Observer programs under the MMPA, and for the groundfish fisheries of Alaska under the Magnuson Fishery Conservation and Management Act of 1976, as amended, 16 U.S.C. 1801 *et seq.* (Magnuson Act), will assist NMFS in determining whether the incidental take of Steller sea lions during commercial fishing operations or other observable activities are factors in the decline in the number of these animals in Alaska.

There are reports of fishermen and other people shooting adult Steller sea lions at rookeries, haulout sites, and in the water near boats, but the magnitude of this mortality is unknown. These activities also have the potential for disruption of breeding activities and use of rookeries and haulout sites.

Determination

NMFS has determined that the available evidence indicates the Steller sea lion is likely to become an endangered species within the foreseeable future and that the threatened classification is appropriate. Although the precise causes of the decline have not been determined, it is likely that the current condition is caused by a combination of the factors specified under section 4(a)(1) of the ESA.

The number of Steller sea lions observed on certain rookeries in Alaska declined by 63 percent since 1985 and by 82 percent since 1960. The decline has spread from the eastern Aleutian Islands, where it began in the early 1970's, east to the Gulf of Alaska and west to the previously stable central Aleutian Islands. Declines are occurring in previously stable areas and on the Kuril Islands, USSR. Despite this well documented decline, NMFS does not believe that an endangered listing is appropriate at this time. Total counts of sea lions at rookeries and haulout sites throughout most of Alaska and the USSR in 1989 were about 56,000, which would indicate a total population size in this area of at least one-third more than this number. NMFS must consider the status of the entire species, including areas where Steller sea lion abundance is stable or not declining significantly, because there is not sufficient information to consider animals in different geographic regions as separate populations. Furthermore, preliminary results from the 1990 Steller sea lion survey show that about 25,000 adult and juvenile sea lions were counted, similar to the 1989 count. These results indicate that the population has not declined further in areas where the decline had been significant, and that the 1989 counts were not anomalous. Therefore, NMFS does not believe that the species currently is in danger of extinction throughout all or a significant portion of its range (i.e., endangered), and is listing the species as threatened.

Final Protective Regulations

Until more comprehensive regulations are developed, NMFS is adopting protective measures similar to those in the emergency interim rule, as follows:

1. *Prohibit shooting near sea lions.* Although the NMPA prohibits intentional lethal take of Steller sea lions in the course of commercial fishing, fishermen have not been prohibited from harassing sea lions that are interfering with their gear or catch by shooting at or near them. Since these practices may result in inadvertent mortalities, NMFS is prohibiting the discharge of a firearm within 100 yards (91.4 meters) of a Steller sea lion.

Exceptions to the shooting provisions include: For activities authorized by a permit issued in accordance with the endangered species permit provisions of 50 CFR part 222, subpart C; for government officials taking Steller sea lions in a humane manner, if the taking is for the protection or welfare of the animal, the protection of the public health and welfare, or the nonlethal removal of nuisance animals; and for the taking of Steller sea lions for subsistence purposes under section 10(e) of the ESA.

2. *Establish Buffer Zones.* NMFS is establishing a buffer zone of 3 nautical miles (5.5 kilometers) around the principal Steller sea lion rookeries in the Gulf of Alaska and the Aleutian Islands. Rookeries in southeastern Alaska, east of 141° W longitude, have not experienced the declines reported in central and western Alaska and no buffer zones are established for these areas. No vessels will be allowed to operate within the 3-mile (5.5 kilometers) buffer zones, with certain exceptions. Similarly, no person will be allowed to approach on land closer than one-half (½) mile (0.8 kilometers) or within sight of a listed Steller sea lion rookery. On Marmot Island, no person will be allowed to approach on land closer than one and one-half (1½) miles (2.4 kilometers) from the eastern shore. Marmot Island was previously the largest Steller sea lion rookery in Alaska and the eastern beaches are used throughout the year by the sea lions.

The purposes of the buffer zones include: Restricting the opportunities for individuals to shoot at sea lions and facilitating enforcement of this restriction; reducing the likelihood of interactions with sea lions, such as accidents or incidental takings in these areas where concentrations of the animals are expected to be high; minimizing disturbances and interference with sea lion behavior, especially at pupping and breeding sites; and, avoiding or minimizing other related adverse effects.

Exceptions to the buffer zone restrictions include: activities authorized by permits issued in accordance with the endangered species permit provisions of 50 CFR part 222, subpart C; for government officials taking Steller sea lions in a humane manner, if the taking is for the protection or welfare of the animal, the protection of the public health and welfare, or the nonlethal removal of nuisance animals; for government officials conducting activities necessary for national defense or the performance of other legitimate governmental activities; and for emergency situations that present a threat to the health, safety or life of a person or a significant threat to a vessel or property. Further, a mechanism is provided to allow the Director, Alaska Region, NMFS to issue exemptions for traditional or historic activities that do not have a significant adverse effect on sea lions and for which there is no readily available and acceptable alternative. Notice of all such exemptions will be published in the **Federal Register**. There is no overall exception to the buffer zone restrictions for subsistence taking of Steller sea lions; and exemption issued by the Regional Director will be needed.

3. *Establish Incidental Kill Quota.* When the MMPA was amended in 1988 to require emergency regulations once 1,350 Steller sea lions were incidentally killed in any year, the population numbers were based, in part, on 1985 data. In four study areas in Alaska, Steller sea lions declined by an average of 63 percent from 1985 to 1989. Therefore, NMFS is prohibiting the incidental killing of more than 675 Steller sea lions on an annual basis in Alaskan waters and adjacent areas of the EEZ west of 141° W longitude. In association with the emergency rule, NMFS instituted a more efficient monitoring system. Foreign processors and domestic groundfish vessels 125 feet (38 meters) or more in length now carry observers during 100 percent of their operations in the EEZ of the Bering Sea and in the Gulf of Alaska. Groundfish

vessels of 60 to 124 feet (18 to 38 meters) in length carry observers during 30 percent of their operations in each quarter. Three additional fisheries in Alaska that are classified as Category I under the MMPA, the Prince William Sound set and drift gillnet fishery for salmon and the South Unimak (Unimak and False Passes) drift gillnet fishery for salmon, had coverage during the 1990 fishing season and are scheduled to have coverage during the 1991 season, if they remain in Category I in the 1991 Revised List of Fisheries. The total incidental take of sea lions will be estimated monthly during the course of the fishing season, based on the in-season observer reports. In order to continue to monitor this quota, NMFS is retaining the observer authority of the emergency rule by allowing the respective Regional Director to place an observer on any fishing vessel. If data indicate that the quota is being approached, the Assistant Administrator for Fisheries, NOAA, will issue emergency rules to close areas to fishing, allocate the remaining quota among fisheries, or take other action to ensure that commercial fishing operations do not exceed the quota.

Critical Habitat

The ESA requires that critical habitat be specified to the maximum extent prudent and determinable at the time the species is proposed for listing. NMFS intends to propose critical habitat at the earliest possible date as a part of the comprehensive protective regulations. NMFS will consider physical and biological factors essential to the conservation of the species that may require special management consideration or protection. These habitat requirements include breeding rookeries, haulout sites, feeding areas and nutritional requirements. In describing critical habitat, NMFS will take into consideration terrestrial habitats adjacent to rookeries and their need for protection from development and other uses, such as logging or mining.

Additional Conservation Measures

In addition to protective regulations, conservation measures for species that are listed as endangered or threatened under the ESA include recognition, recovery actions, designation and protection of critical habitat, and Federal agency consultation. NMFS has established a Recovery Team to assist in developing a Recovery Plan for the Steller sea lion. This plan will help guide the recovery efforts of NMFS and other agencies and organizations.

Section 7(a)(2) of the ESA requires that each Federal agency insure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of its critical habitat. Federal actions most likely to affect the Steller sea lion include approval and implementation of fishery management plans and regulations under the Magnuson Act; permitted activities on land near rookeries and haulout sites, such as timber, mineral and oil development; and, leasing activities associated with offshore oil and gas exploration and development on the Outer Continental Shelf.

Once the Steller sea lion is listed as threatened, it is, by definition, considered depleted under the MMPA, and additional restrictions apply under that Act, such as a prohibition on taking for public display purposes.

Classification

Section 4(b)(1) of the ESA restricts the information that may be considered when assessing species for listing. Based on this limitation and the opinion in *Pacific Legal Foundation* v. *Andrus*, 657 F. 2d 829 (6th cir., 1981), NMFS has categorically excluded all listing actions under the ESA from environmental assessment requirements of the National Environments' Policy Act (48 FR 4413; February 6, 1984).

As noted in the Conference report on the 1982 amendments to the ESA, economic considerations have no relevance to determinations regarding the listing status of species. Therefore, the economic analysis requirements of Executive Order 12291, the Regulatory Flexibility Act, and the Paperwork Reduction Act are not applicable to the listing process.

NMFS is waiving part of the 30-day delay between the publication of a final rule and its effective date under 5 U.S.C. 553(d). There will be very few new regulatory requirements applicable to the public as a result of this final rule because it is very similar to the emergency rule which has listed the Steller sea lion as a threatened species since April 10, 1990. Because that emergency rule expires on December 3, 1990, it would be contrary to the public interest to delay the effective date of this final rule beyond December 4; any such delay could be detrimental to the Steller sea lion because it would cause a hiatus in the protection of the species under the ESA. Therefore, NMFS finds there is good cause to waive the 30-day delay in the effective date under section 553(d)(3), and is making this rule effective December 4, 1990.

List of Subjects in 50 CFR Part 227

Endangered and threatened wildlife.

For the reasons set out in the preamble, 50 CFR part 227 is amended as follows:

PART 227—THREATENED FISH AND WILDLIFE

1. The authority citation for part 227 continues to read as follows:

Authority: 16 U.S.C. 1531 *et seq.*

2. In § 227.4, a new paragraph (f) is added to read as follows:

§ 227.4 Enumeration of threatened species.

* * * * *

(f) Steller (northern) sea lion (*Eumetopias jubatus*).

3. In subpart B, a new section is added to read as follows:

§ 227.12 Steller sea lion.

(a) *Prohibitions*—(1) *No discharge of firearms.* Except as provided in paragraph (b) of this section, no person subject to the jurisdiction of the United States may discharge a firearm at or within 100 yards (91.4 meters) of a Steller sea lion. A firearm is any weapon, such as a pistol or rifle, capable of firing a missile using an explosive charge as a propellant.

(2) *No approach in buffer areas.* Except as provided in paragraph (b) of this section:

(i) No owner or operator of a vessel may allow the vessel to approach within 3 nautical miles (5.5 kilometers) of a Steller sea lion rookery site listed in paragraph (a)(3) of this section;

(ii) No person may approach on land not privately owned within one-half statutory miles (0.8 kilometers) or within sight of a Steller sea lion rookery site listed in paragraph (a)(3) of this section, whichever is greater, except on Marmot Island; and

(iii) No person may approach on land not privately owned within one and one-half statutory miles (2.4 kilometers) or within sight of the eastern shore of Marmot Island, including the Steller sea lion rookery site listed in paragraph (a)(3) of this section, whichever is greater.

(3) *Listed sea lion rookery sites.* Listed Steller sea lion rookery sites consist of the rookeries in the Aleutian Islands and the Gulf of Alaska listed in Table 1.

TABLE 1. LISTED STELLER SEA LION ROOKERY SITES [1]

Island	From		To		NOAA chart	Notes
	Lat.	Long.	Lat.	Long.		
1. Outer I.	59°20.5 N	150°23.0 W	59°21.0 N	150°24.5 W	16681	S quadrant.
2. Sugarloaf I.	58°53.0 N	152°02.0 W			16580	Whole island.
3. Marmot I.	58°14.5 N	151°47.5 W	58°10.0 N	151°51.0 W	16580	SE quadrant.
4. Chinkof I.	55°46.5 N	155°39.5 W	55°46.5 N	155°43.0 W	16580	S quadrant.
5. Chowiet I.	56°00.5 N	156°41.5 W	56°00.5 N	156°42.0 W	16013	S quadrant.
6. Atkins I.	55°03.5 N	159°18.5 W			16540	Whole island.
7. Chernabura I.	54°47.5 N	159°31.0 W	54°45.5 N	159°33.5 W	16540	SE corner.
8. Pinnacle Rock	54°46.0 N	161°46.0 W			16540	Whole island.
9. Clubbing Rks (N)	54°43.0 N	162°26.5 W			16540	Whole island.
Clubbing Rks (S)	54°42.0 N	162°26.5 W			16540	Whole island.
10. Sea Lion Rks	55°28.0 N	163°12.0 W			16520	Whole island.
11. Ugamak I.	54°14.0 N	164°48.0 W	54°13.0 N	164°48.0 W	16520	E end of island.
12. Akun I.	54°17.5 N	165°34.0 W	54°18.0 N	165°31.0 W	16520	Billings Head Bight.
13. Akutan I.	54°03.5 N	166°00.0 W	54°05.5 N	166°05.0 W	16520	SW corner, Cape Morgan.
14. Bogoslof I.	53°56.0 N	168°02.0 W			16500	Whole island.
15. Ogchul I.	53°00.0 N	168°24.0 W			16500	Whole island.
16. Adugak I.	52°55.0 N	169°10.5 W			16500	Whole island.
17 Yunaska I.	52°42.0 N	170°38.5 W	52°41.0 N	170°34.5 W	16500	NE end.
18. Seguam I.	52°21.0 N	172°35.0 W	52°21.0 N	172°33.0 W	16480	N coast, Saddleridge Pt.
19. Agligadak I.	52°06.5 N	172°54.0 W			16480	Whole island.
20. Kasatochi I.	52°10.0 N	175°31.0 W	52°10.5 N	175°29.0 W	16480	N half of island.
21. Adak I.	51°36.5 N	176°58.5 W	51°38.0 N	176°59.5 W	16460	SW point, Lake Point.
22. Gramp rock	51°29.0 N	178°20.5 W			16460	Whole island.
23. Tag I.	51°33.5 N	178°34.5 W			16460	Whole island.
24. Ulak I.	51°20.0 N	178°57.0 W	51°18.5 N	178°59.5 W	16460	SE corner, Hasgox Pt.
25. Semisopochnoi	51°58.5 N	179°45.5 E	51°57.0 N	179°46.0 E	16440	E quadrant, Pochnoi Pt.
Semisopochnoi	52°01.5 N	179°37.5 E	52°01.5 N	179°39.0 E	16440	N quadrant, Petrel Pt.
26. Amchitka I.	51°22.5 N	179°28.0 E	51°22.0 N	179°25.0 E	16440	East Cape.
27. Amchitka I.	51°32.5 N	178°50.0 E			16440	Column Rocks.
28. Ayugadak Pt.	51°45.5 N	178°24.5 E			16440	SE coast of Rat Island.
29. Kiska I.	51°57.5 N	177°21.0 E	51°56.5 N	177°20.0 E	16440	W central, Lief Cove.
30. Kiska I.	51°52.5 N	177°13.0 E	51°53.5 N	177°12.0 E	16440	Cape St. Stephen.
31. Walrus I.	57°11.0 N	169°56.0 W			16380	Whole island.
32. Buldir I.	52°20.5 N	175°57.0 E	52°23.5 N	175°51.0 E	16420	Se point to NW point.
33. Agattu I.	52°24.0 N	173°21.5 E			16420	Gillion Point.
34. Agattu I.	52°23.5 N	173°43.5 E	52°22.0 N	173°41.0 E	16420	Cape Sabak.
35. Attu I.	52°57.5 N	172°31.5 E	52°54.5 N	172°28.5 E	16420	Cape Wrangell.

[1] Each site extends in a clockwise direction from the first set of geographic coordinates along the shoreline at mean lower low water to the second set of coordinates; or, if only one set of geographic coordinates is listed, the site extends around the entire shoreline of the island at mean lower low water.

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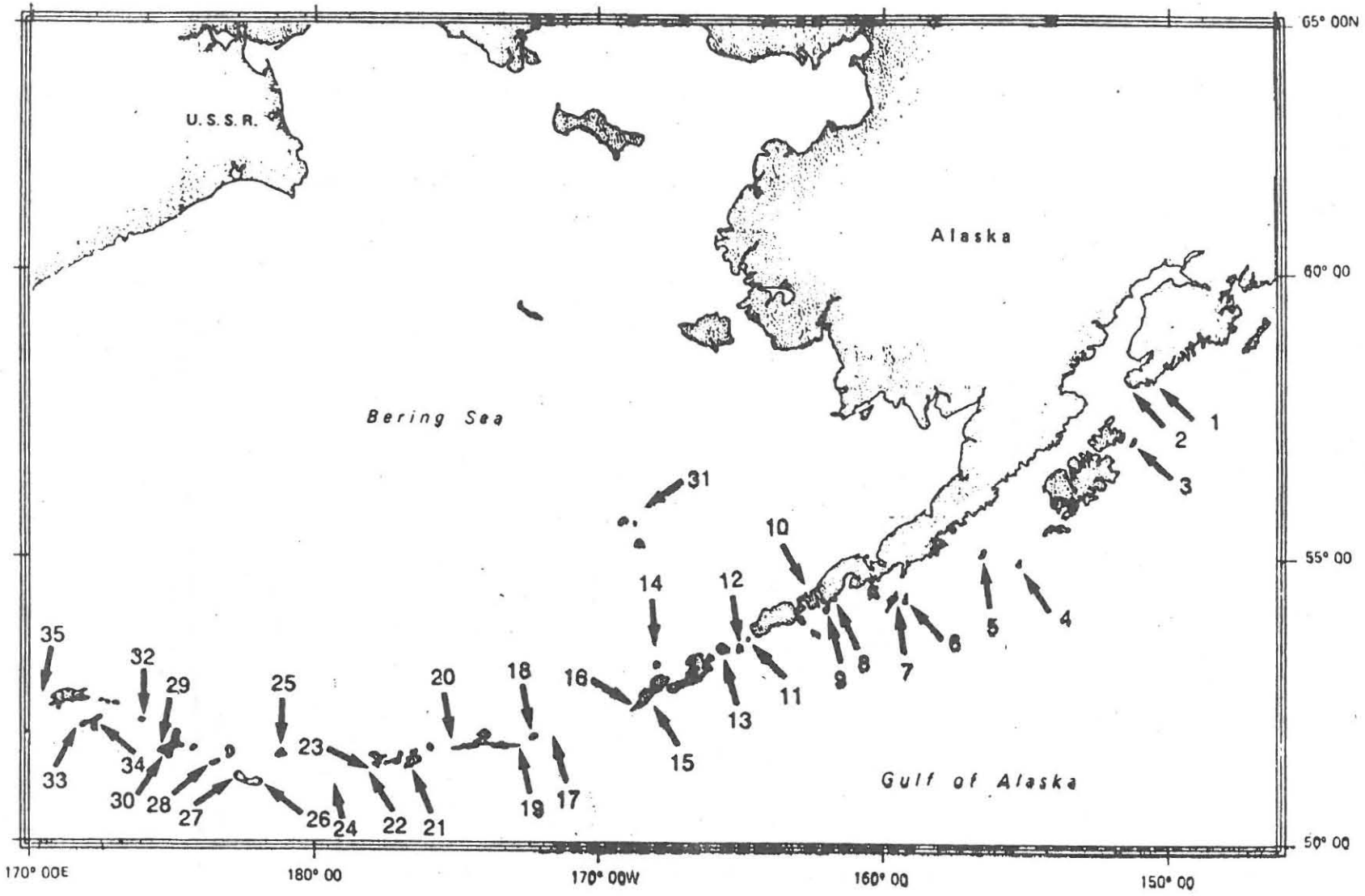
U.S.S.R.
Alaska
Bering Sea
Gulf of Alaska
65° 00N
60° 00
55° 00
50° 00
170° 00E
180° 00
170° 00W
160° 00
150° 00
1
2
3
4
5
6
7
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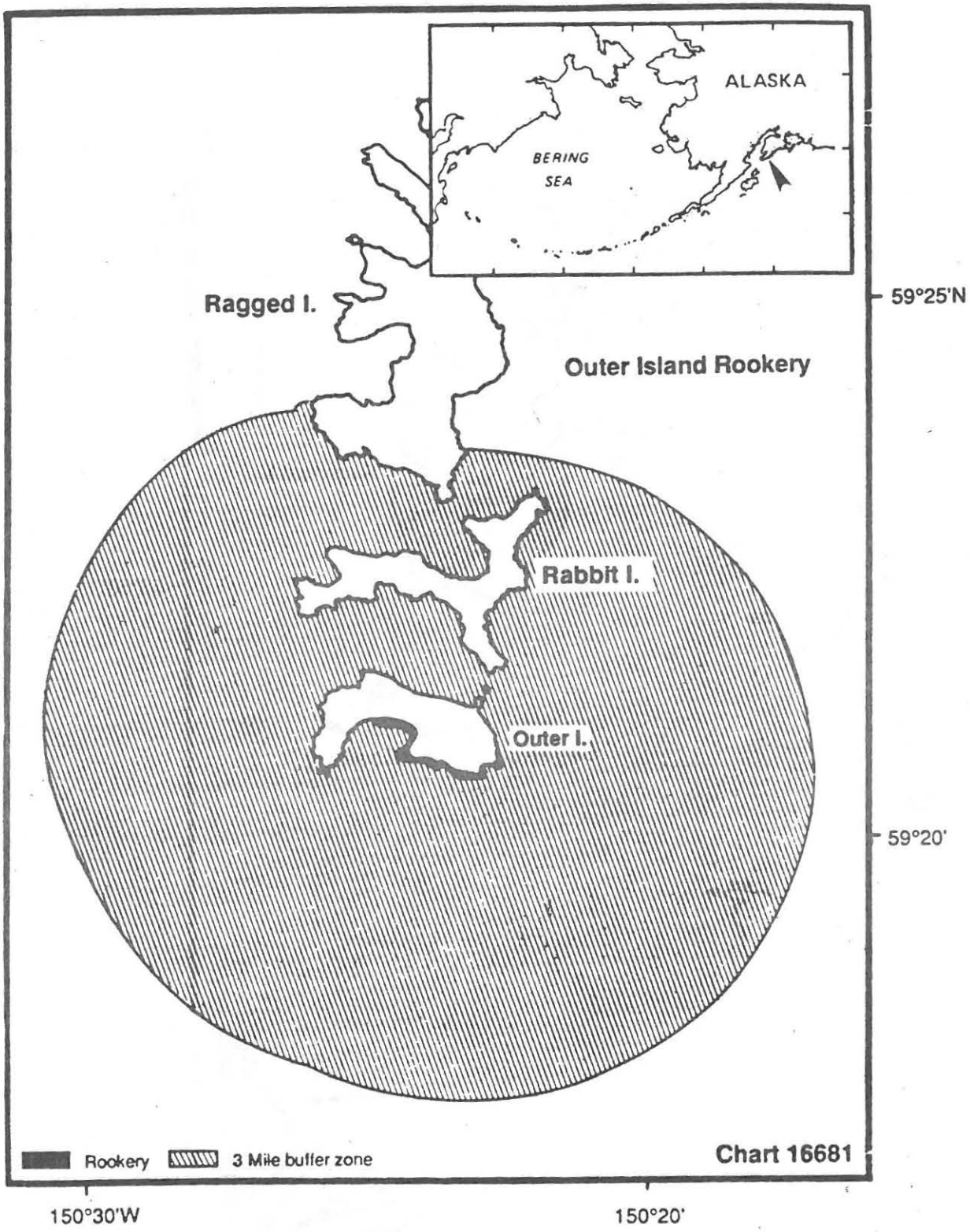
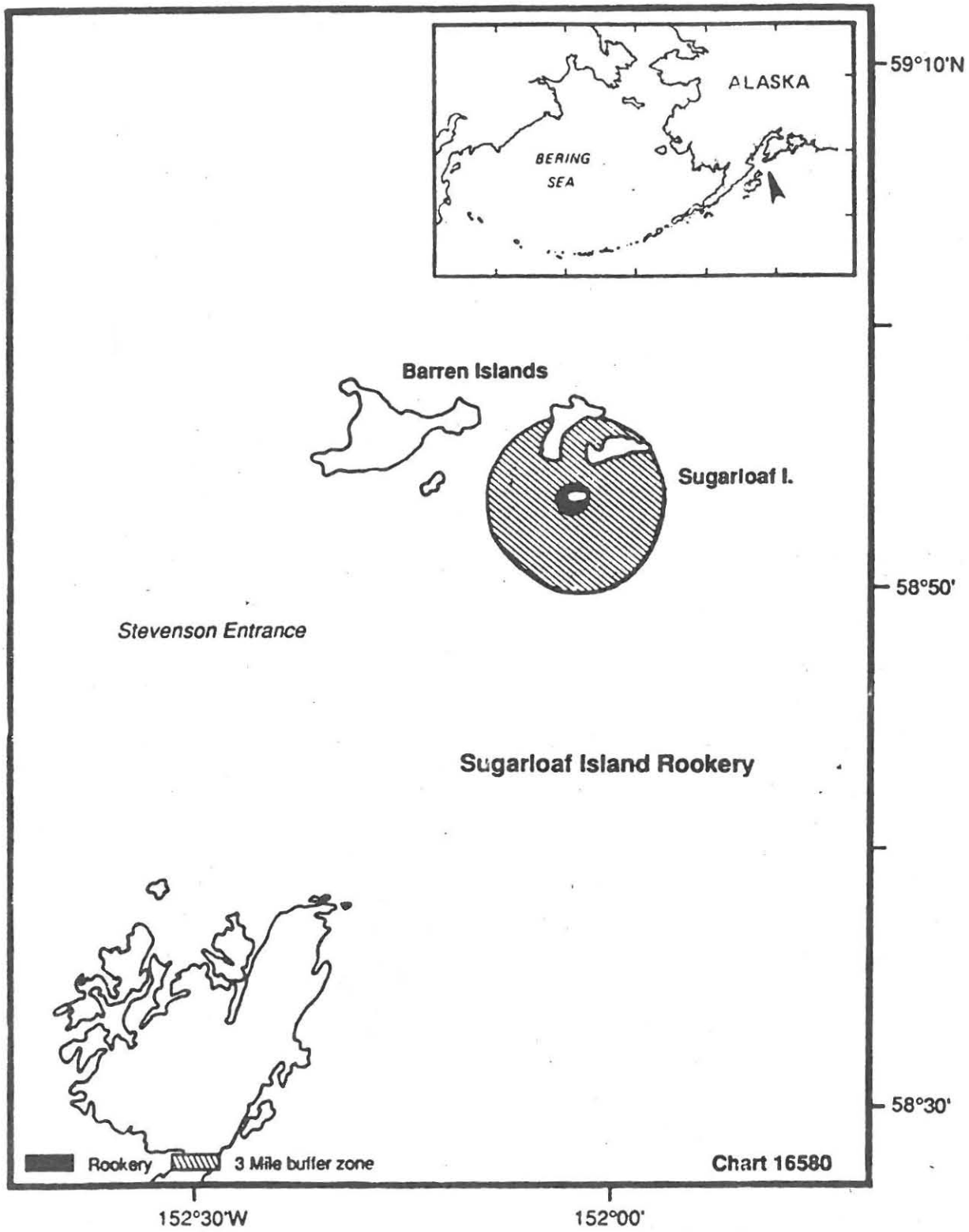
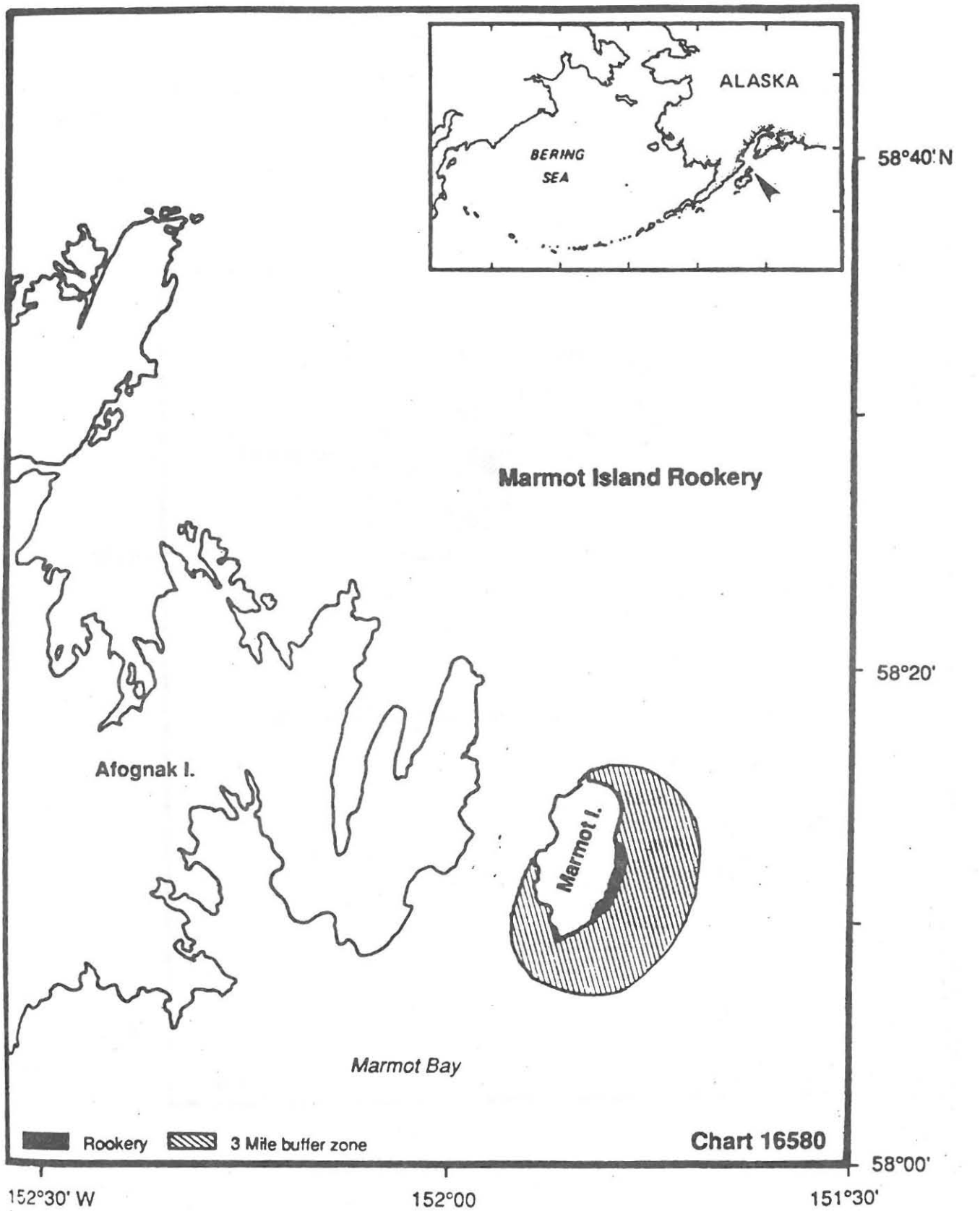
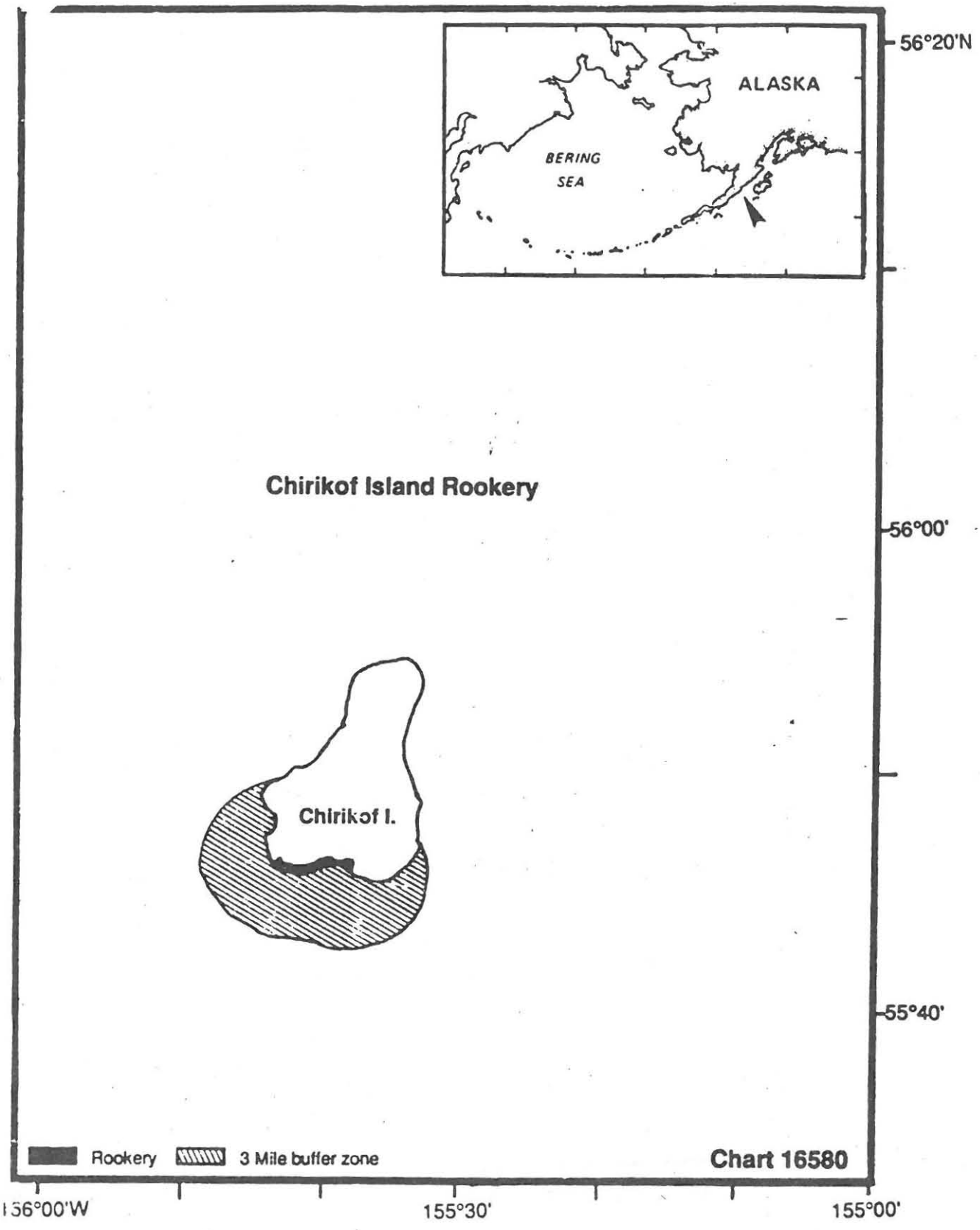
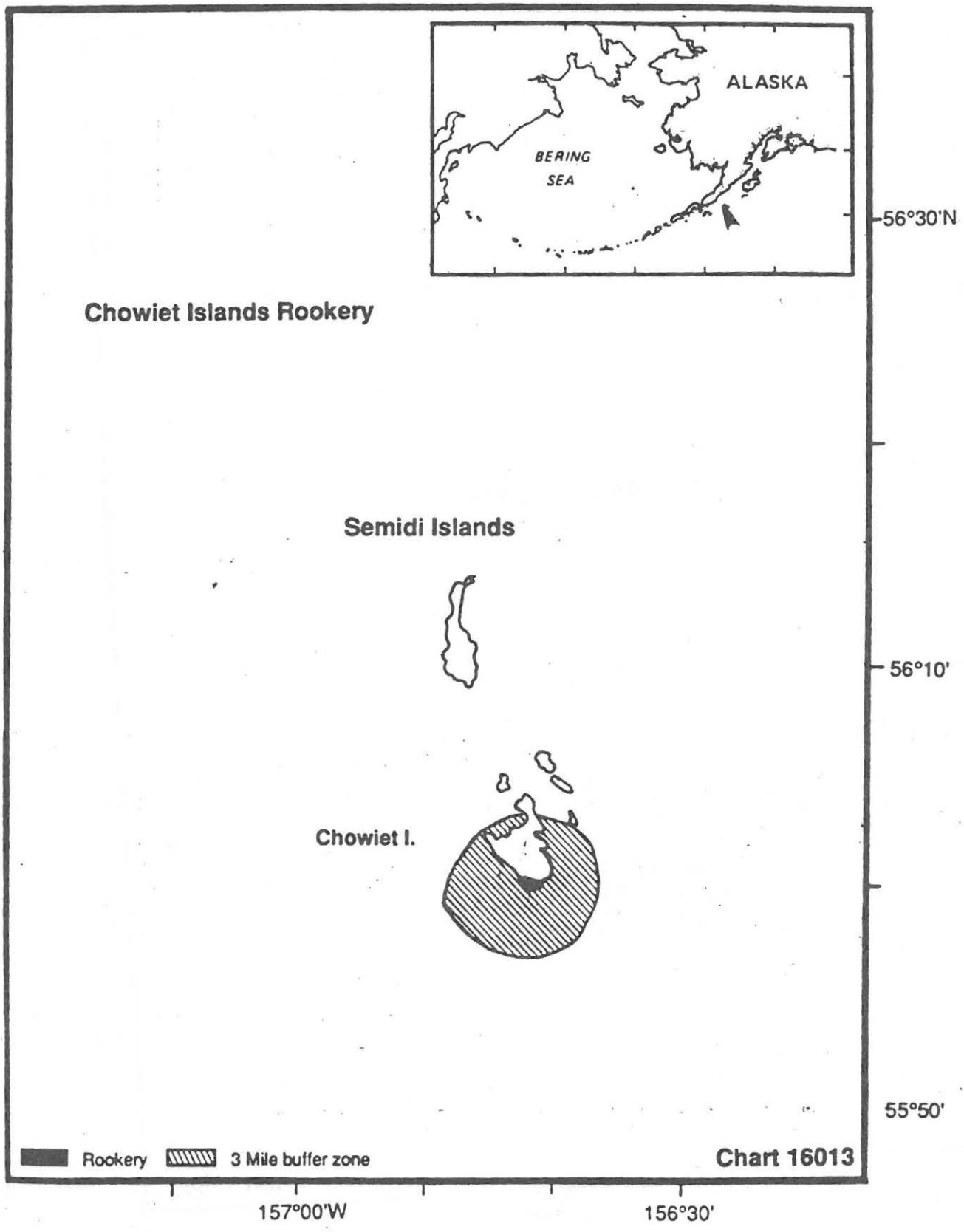
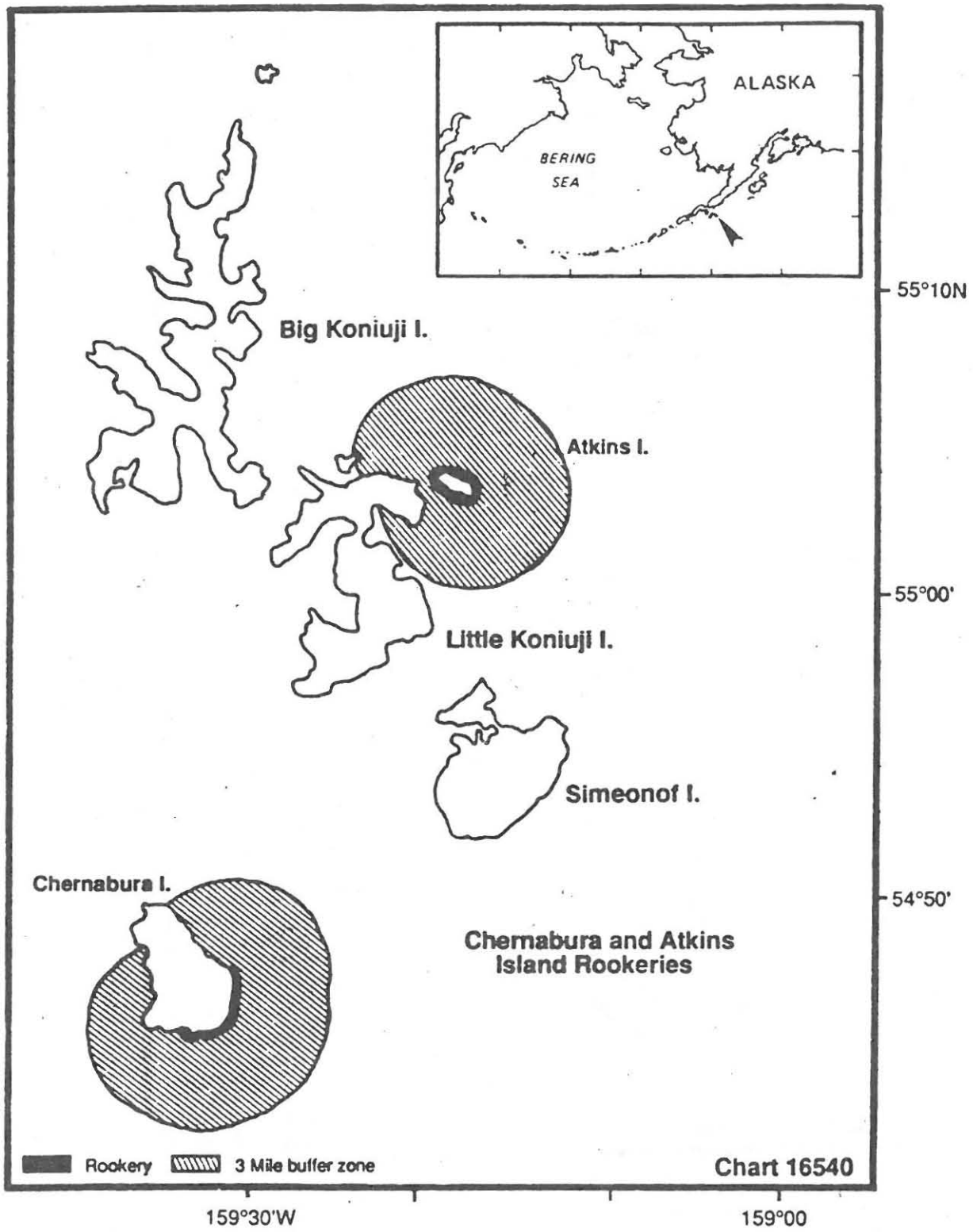

ALASKA
BERING SEA
Ragged I.
Outer Island Rookery
Rabbit I.
Outer I.
59°25'N
59°20'
Rookery
3 Mile buffer zone
Chart 16681
150°30'W
150°20'

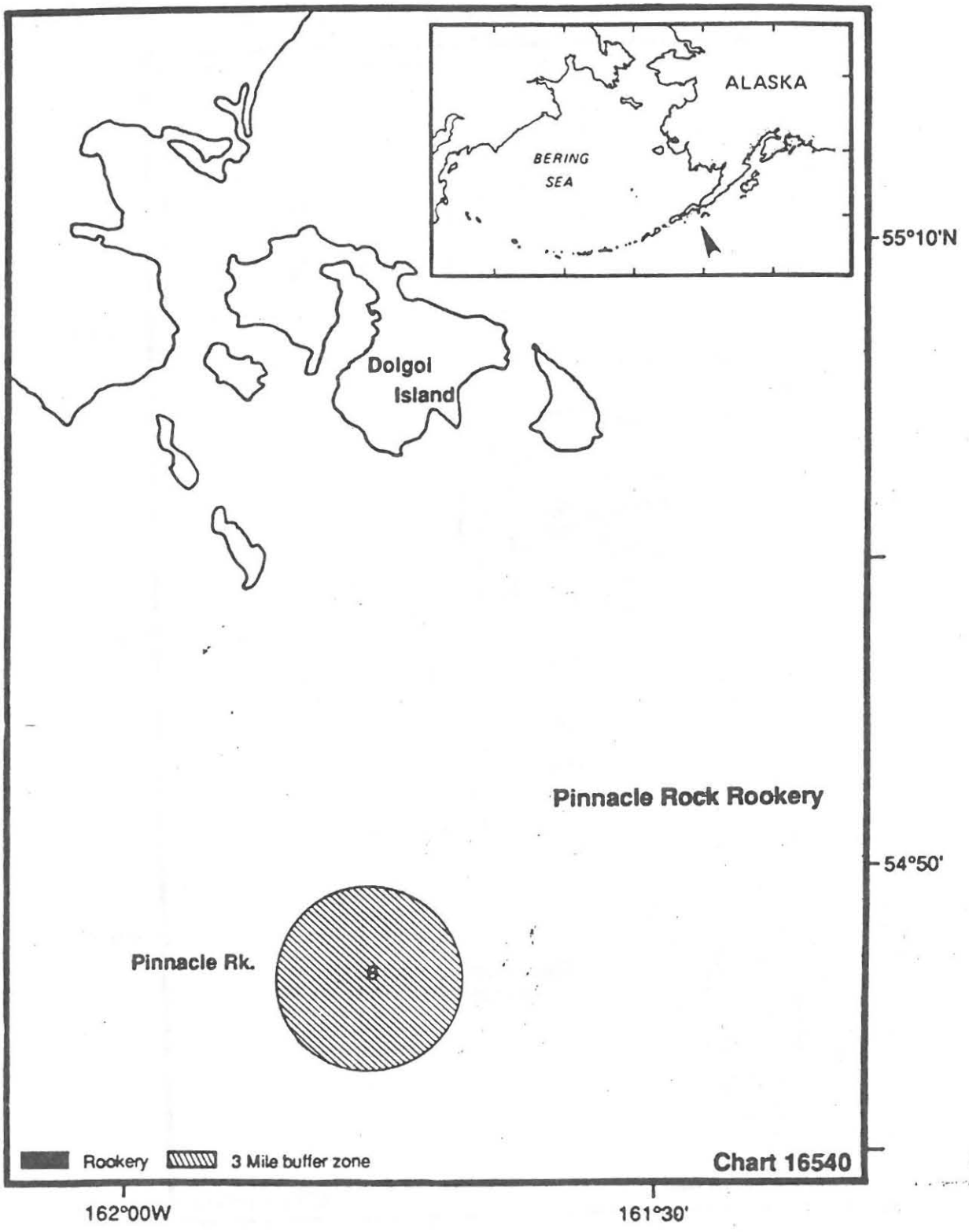

ALASKA
BERING SEA
59°10'N
Barren Islands
Sugarloaf I.
58°50'
Stevenson Entrance
Sugarloaf Island Rookery
58°30'
Rookery
3 Mile buffer zone
Chart 16580
152°30'W
152°00'

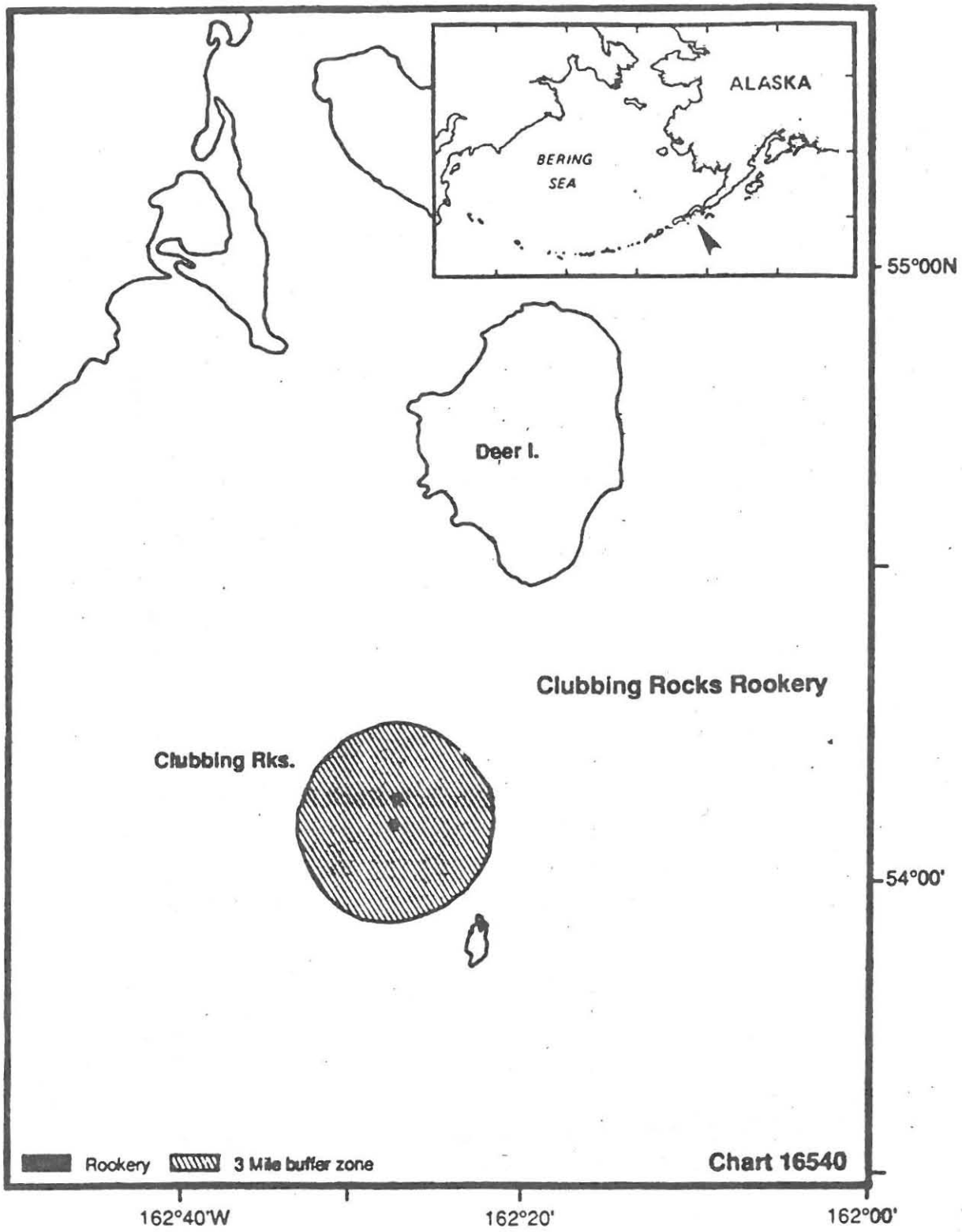

ALASKA
BERING SEA
58°40' N
Marmot Island Rookery
58°20'
Afognak I.
Marmot I.
Marmot Bay
Rookery
3 Mile buffer zone
Chart 16580
58°00'
152°30' W
152°00
151°30'

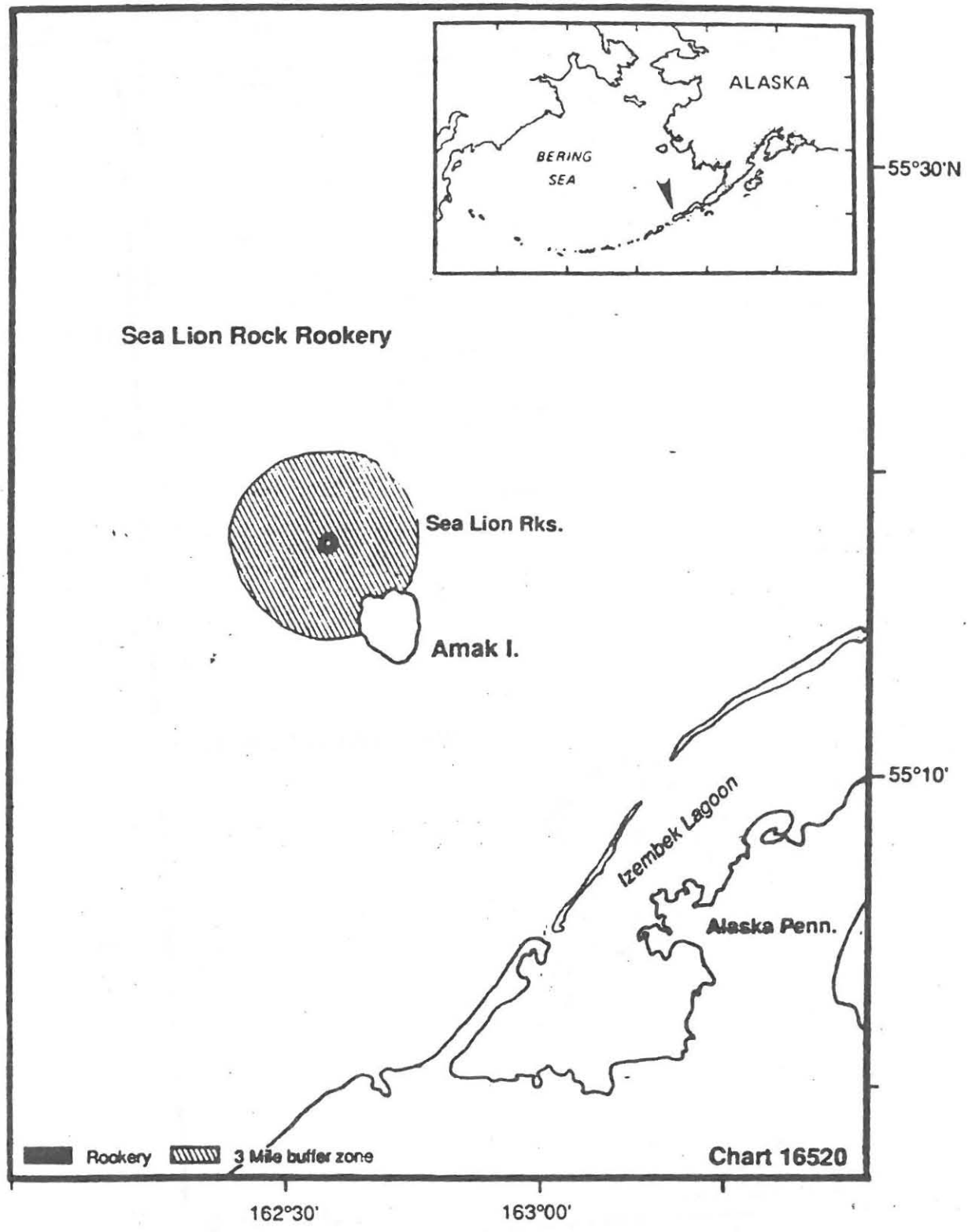

ALASKA
BERING SEA
56°20'N
Chirikof Island Rookery
56°00'
Chirikof I.
55°40'
Rookery
3 Mile buffer zone
Chart 16580
156°00'W
155°30'
155°00'


ALASKA
BERING SEA
56°30'N
Chowiet Islands Rookery
Semidi Islands
56°10'
Chowiet I.
55°50'
Rookery
3 Mile buffer zone
Chart 16013
157°00'W
156°30'


ALASKA
BERING SEA
55°10N
Big Koniuji I.
Atkins I.
55°00'
Little Koniuji I.
Simeonof I.
Chernabura I.
54°50'
Chernabura and Atkins Island Rookeries
Rookery
3 Mile buffer zone
Chart 16540
159°30'W
159°00


ALASKA
BERING SEA
55°10'N
Dolgoi Island
Pinnacle Rock Rookery
54°50'
Pinnacle Rk.
3
Rookery
3 Mile buffer zone
Chart 16540
162°00W
161°30'


ALASKA
BERING SEA
55°00N
Deer I.
Clubbing Rocks Rookery
Clubbing Rks.
54°00'
Rookery
3 Mile buffer zone
Chart 16540
162°40'W
162°20'
162°00'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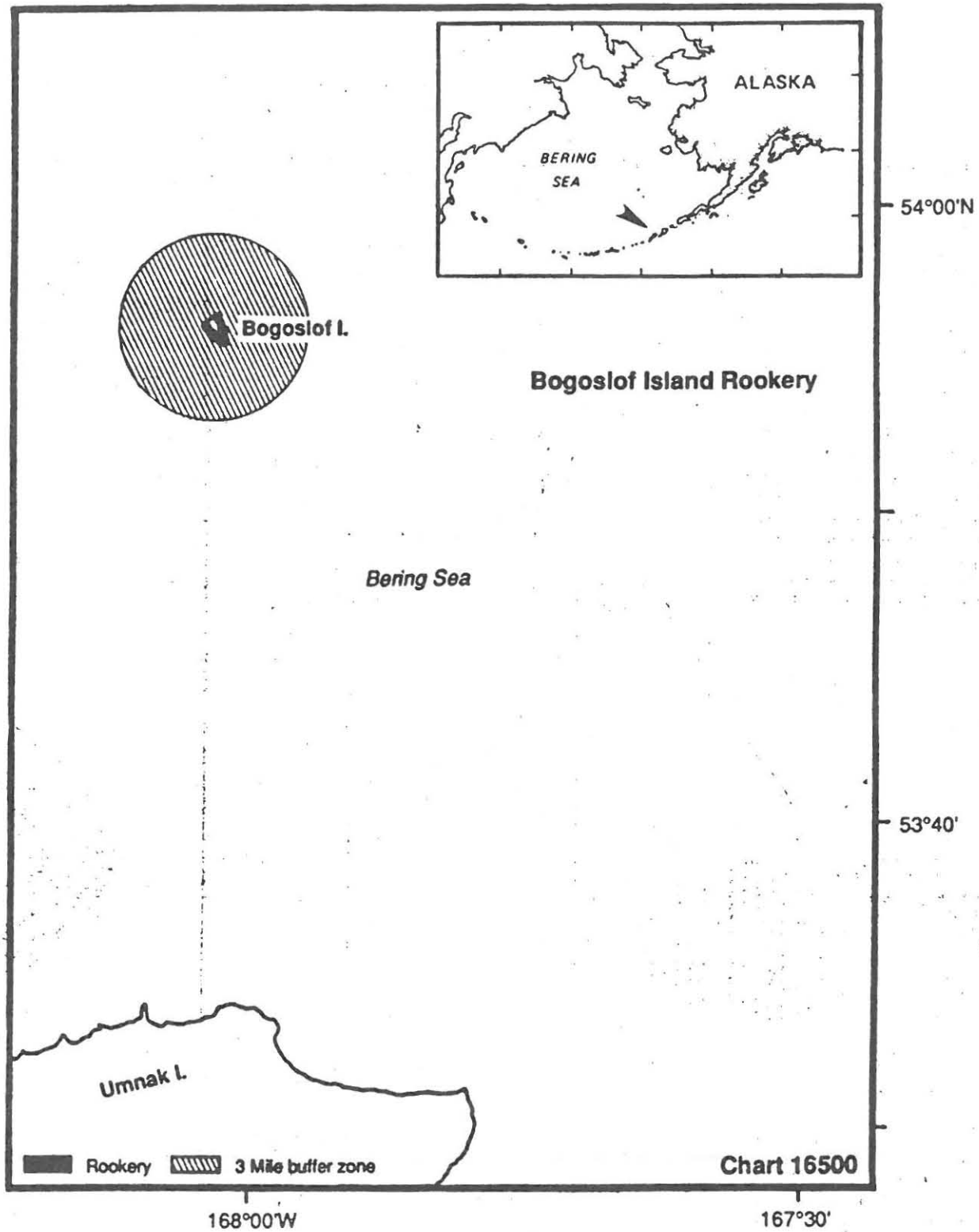
55°30'N
Sea Lion Rock Rookery
Sea Lion Rks.
Amak I.
55°10'
Izembek Lagoon
Alaska Penn.
Rookery
3 Mile buffer zone
Chart 16520
162°30'
163°00'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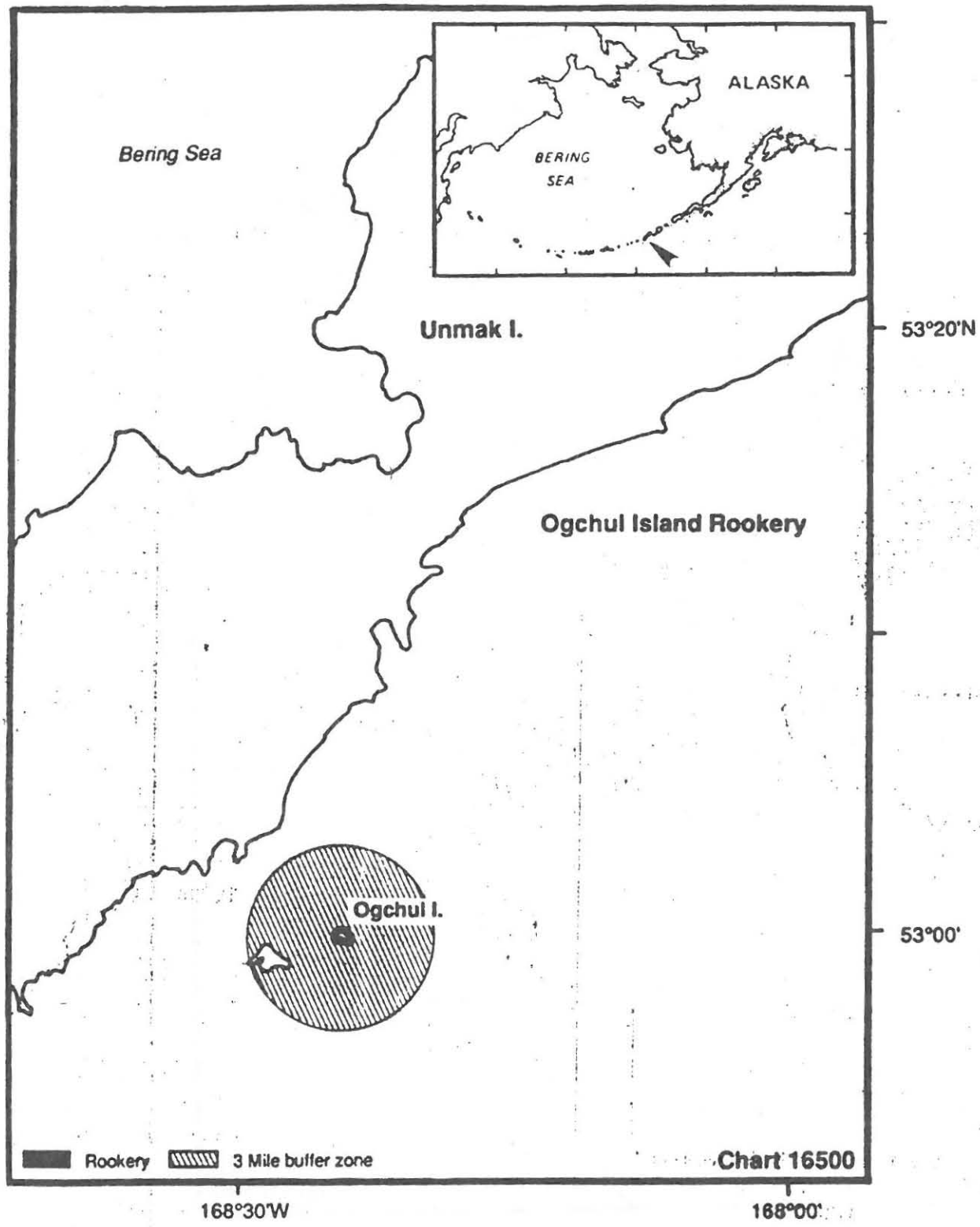
BERING SEA
54°00'N
Bogoslof I.
Bogoslof Island Rookery
Bering Sea
53°40'
Umnak I.
Rookery
3 Mile buffer zone
Chart 16500
168°00'W
167°30'


ALASKA
BERING SEA
Bering Sea
Unmak I.
Ogchul Island Rookery
Ogchul I.
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53°00'
Rookery
3 Mile buffer zone
Chart 16500
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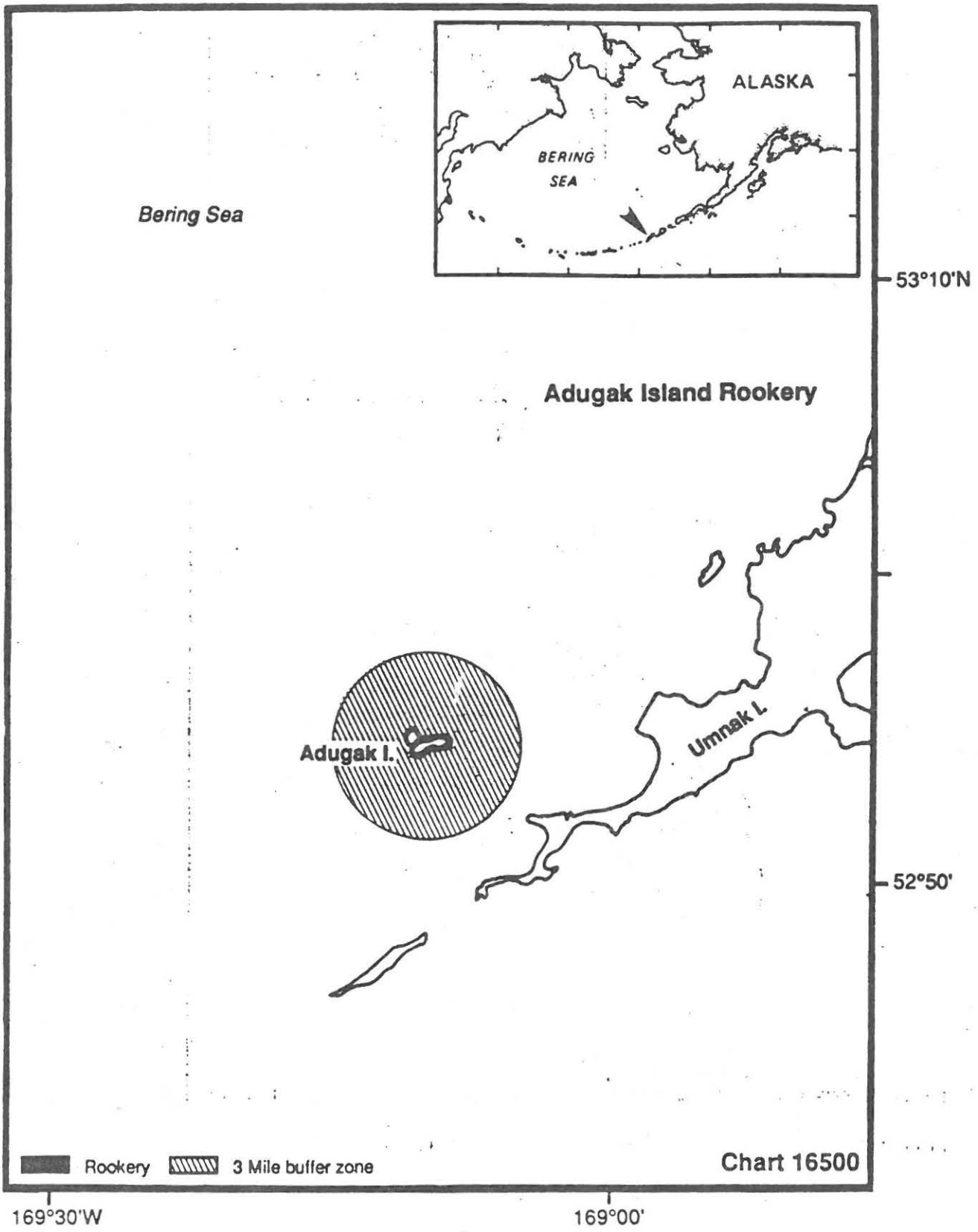
168°00'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Bering Sea
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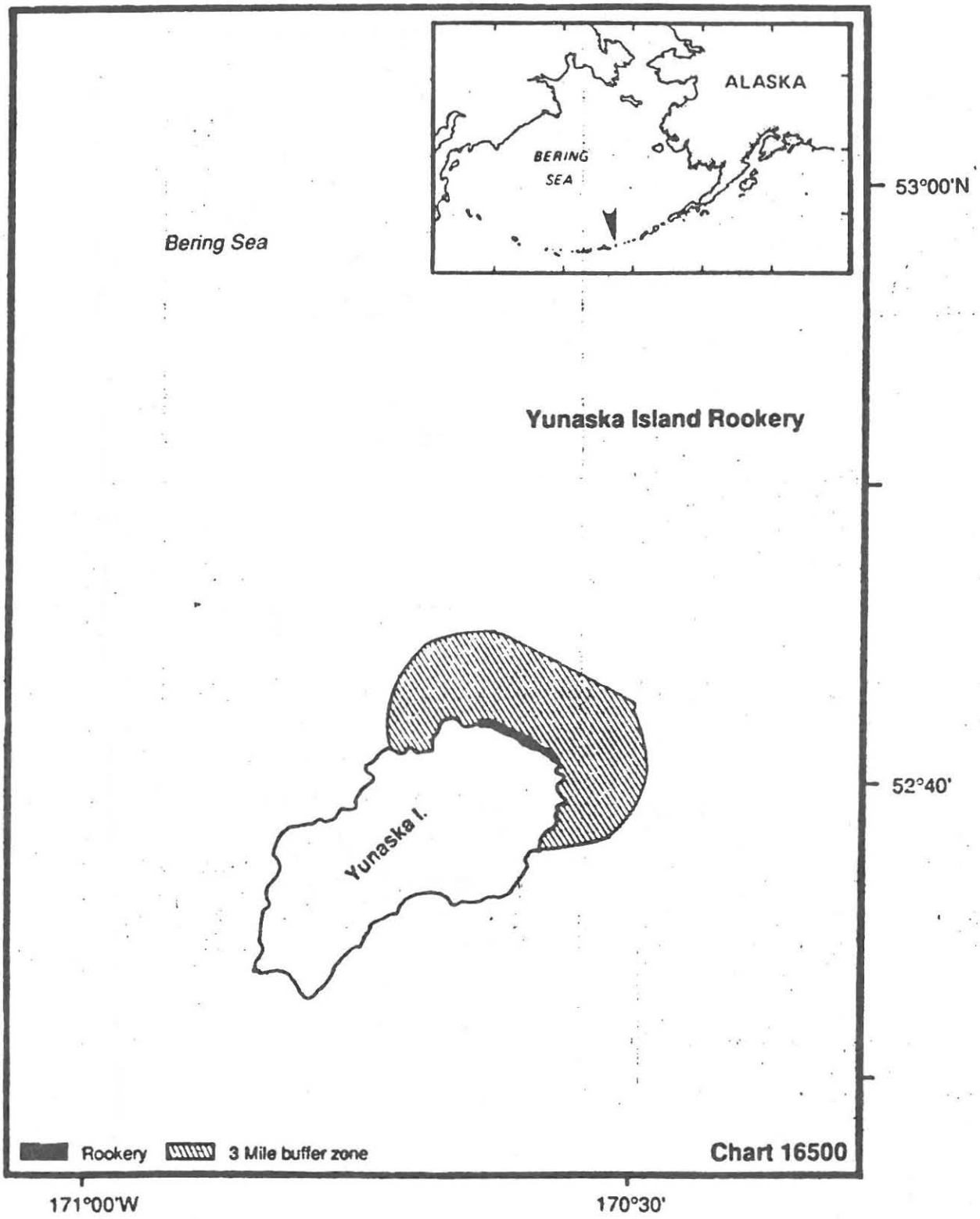
Adugak I.
Umnak I.
52°50'
Rookery
3 Mile buffer zone
Chart 16500
169°30'W
169°00'


ALASKA
BERING SEA
Bering Sea
53°00'N
Yunaska Island Rookery
Yunaska I.
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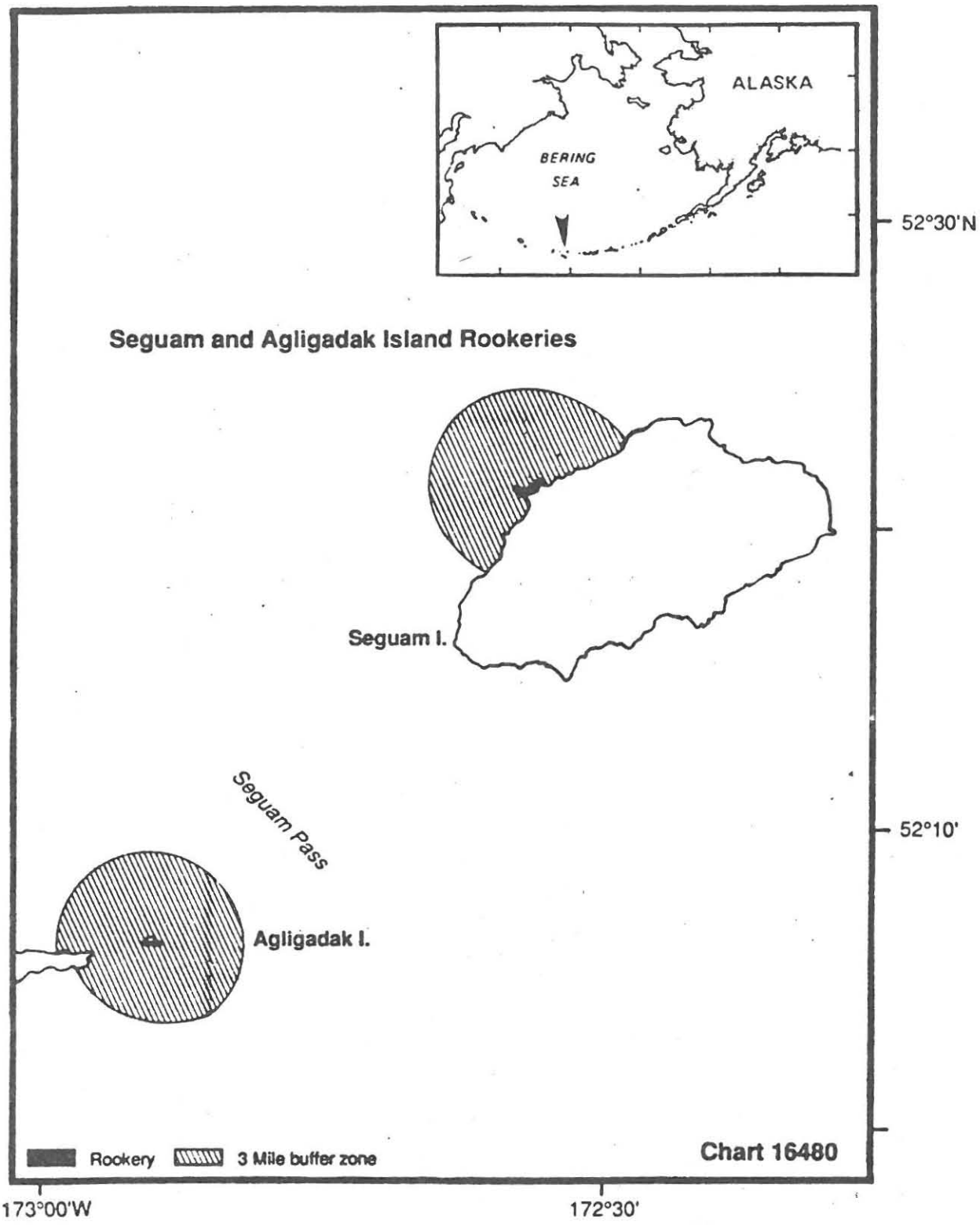
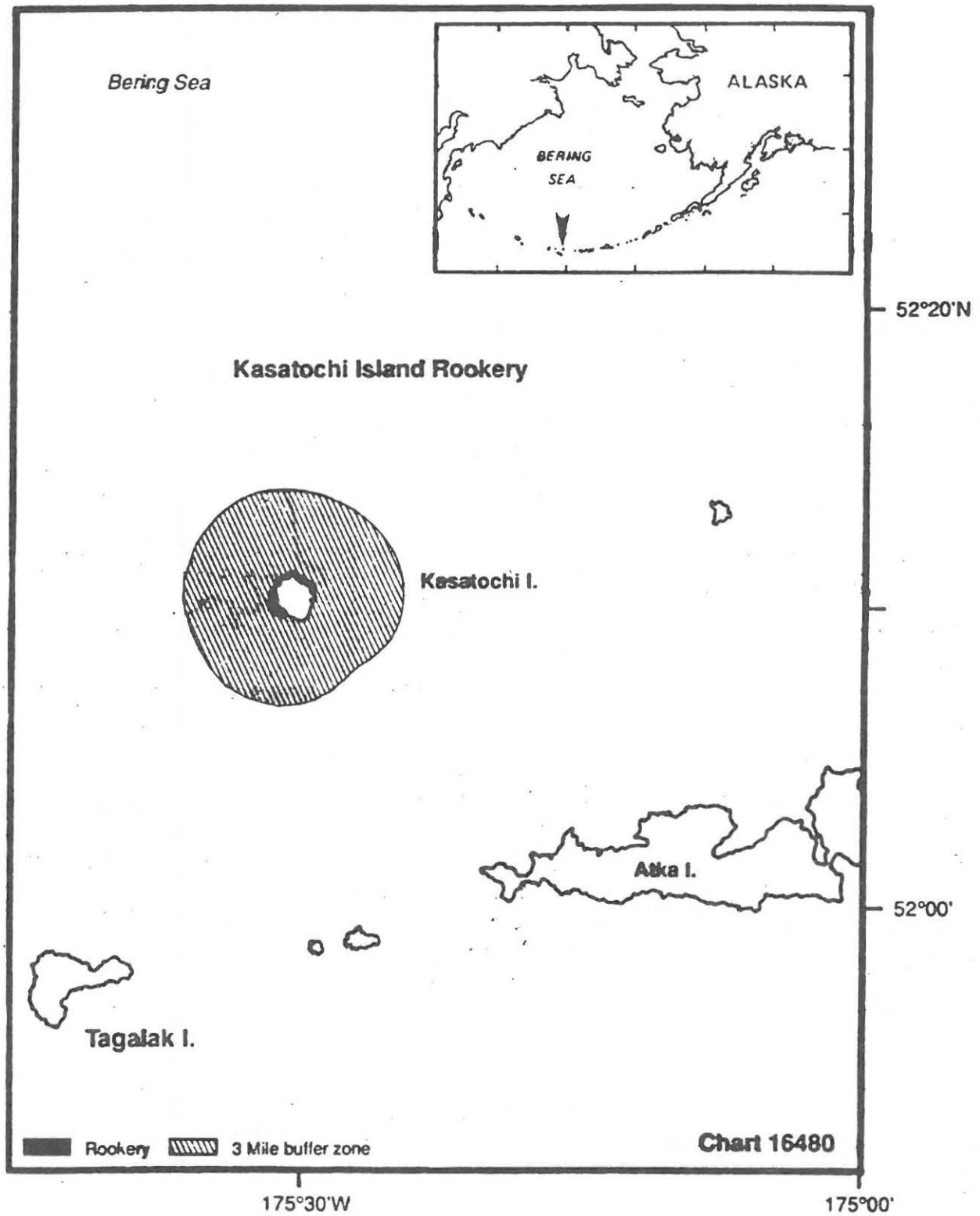
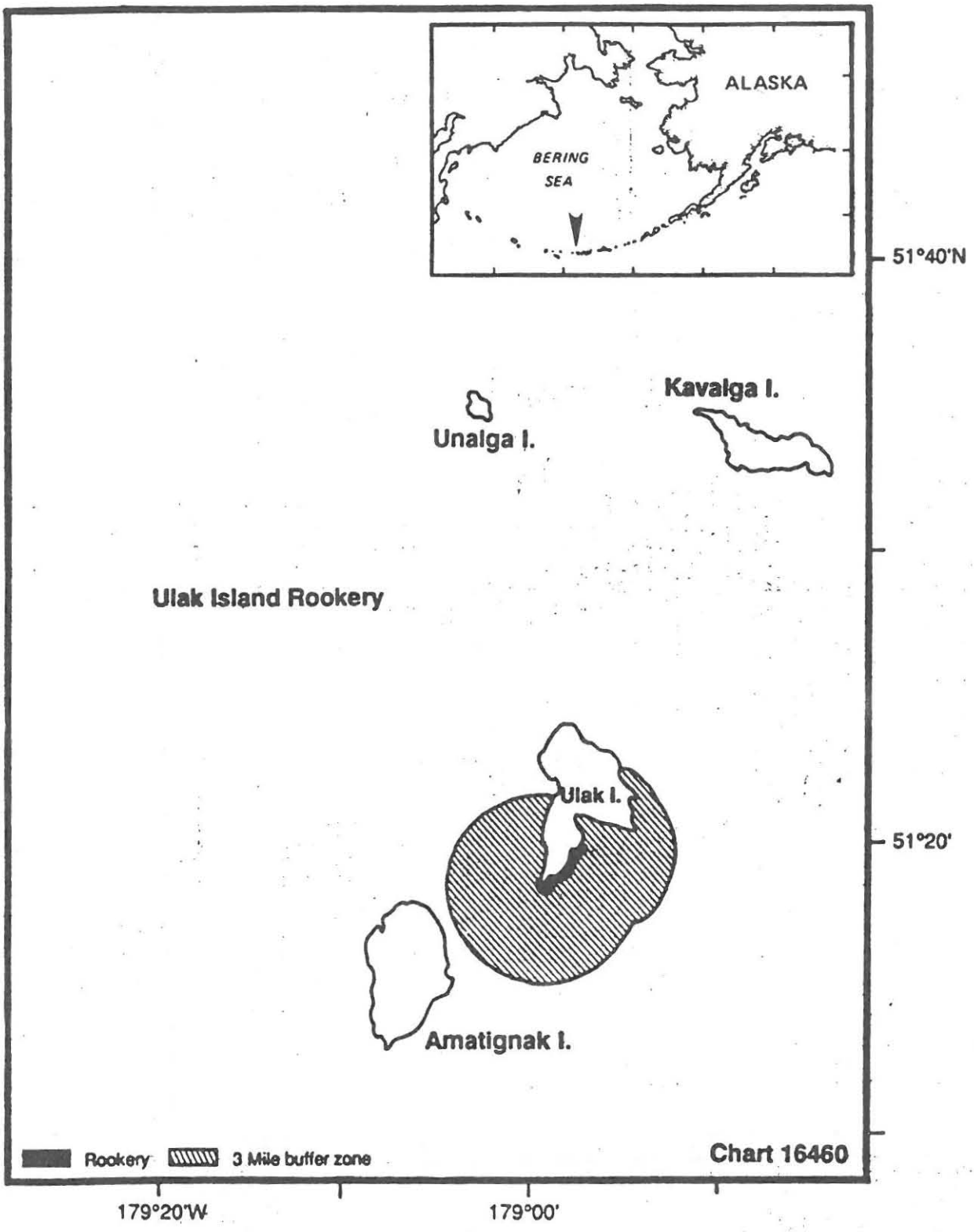
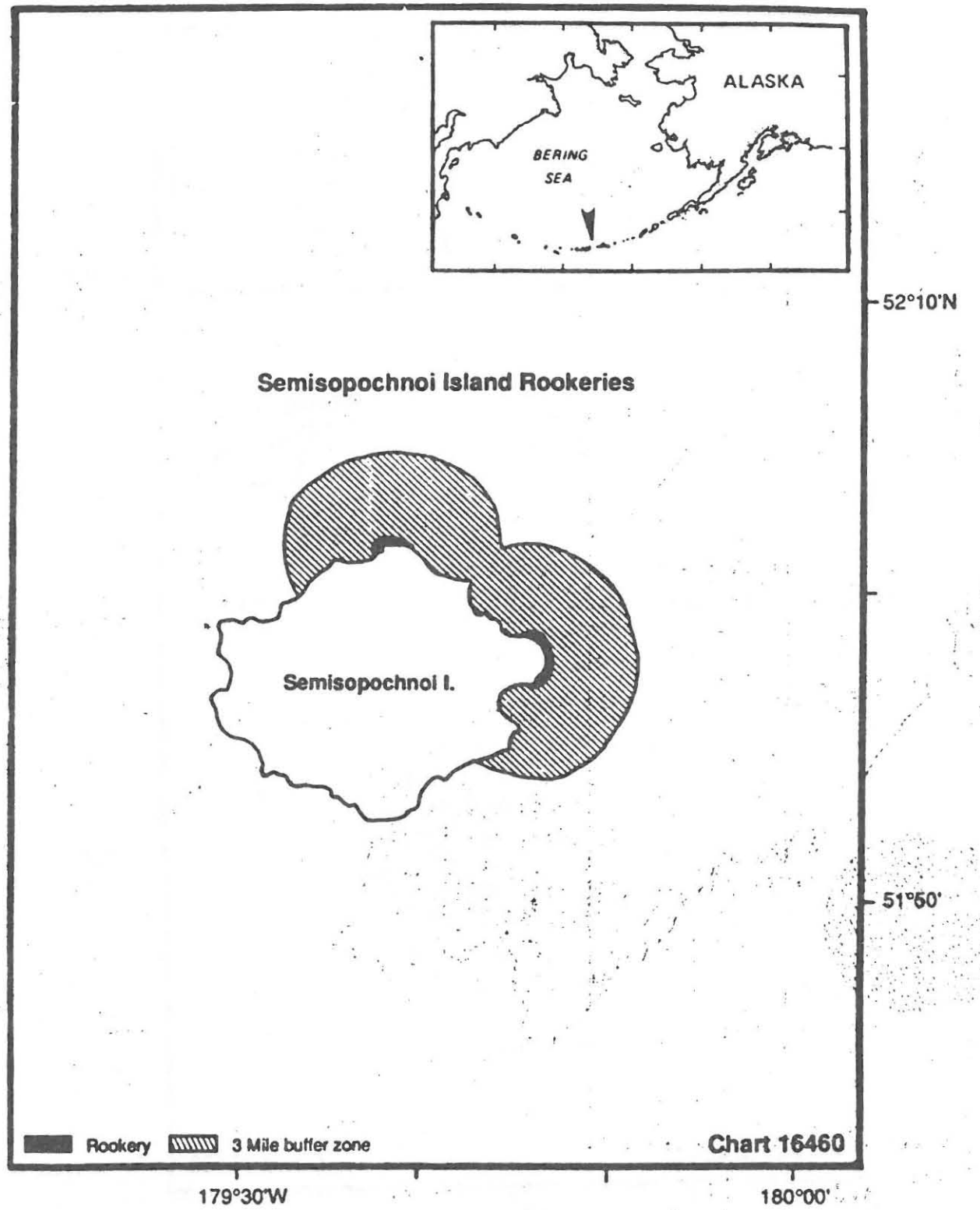
Rookery
3 Mile buffer zone
Chart 16500
171°00'W
170°30'


ALASKA
BERING SEA
52°30'N
Seguam and Agligadak Island Rookeries
Seguam I.
Seguam Pass
52°10'
Agligadak I.
Rookery
3 Mile buffer zone
Chart 16480
173°00'W
172°30'


Bering Sea
ALASKA
BERING SEA
52°20'N
Kasatochi Island Rookery
Kasatochi I.
Atka I.
52°00'
Tagalak I.
Rookery
3 Mile buffer zone
Chart 16480
175°30'W
175°00'


ALASKA
BERING SEA
51°40'N
Kavalga I.
Unalga I.
Ulak Island Rookery
Ulak I.
51°20'
Amatignak I.
Rookery
3 Mile buffer zone
Chart 16460
179°20'W
179°00'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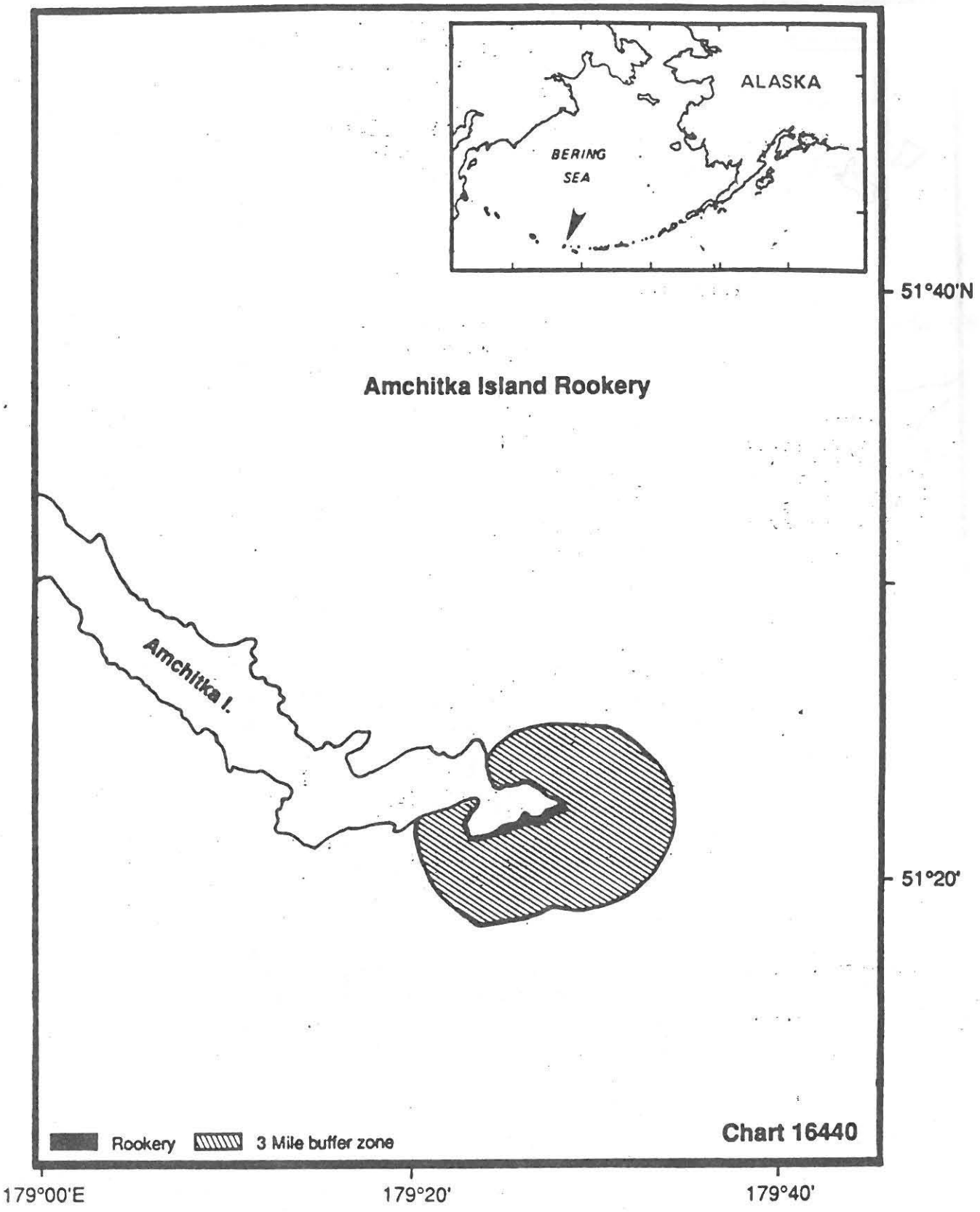
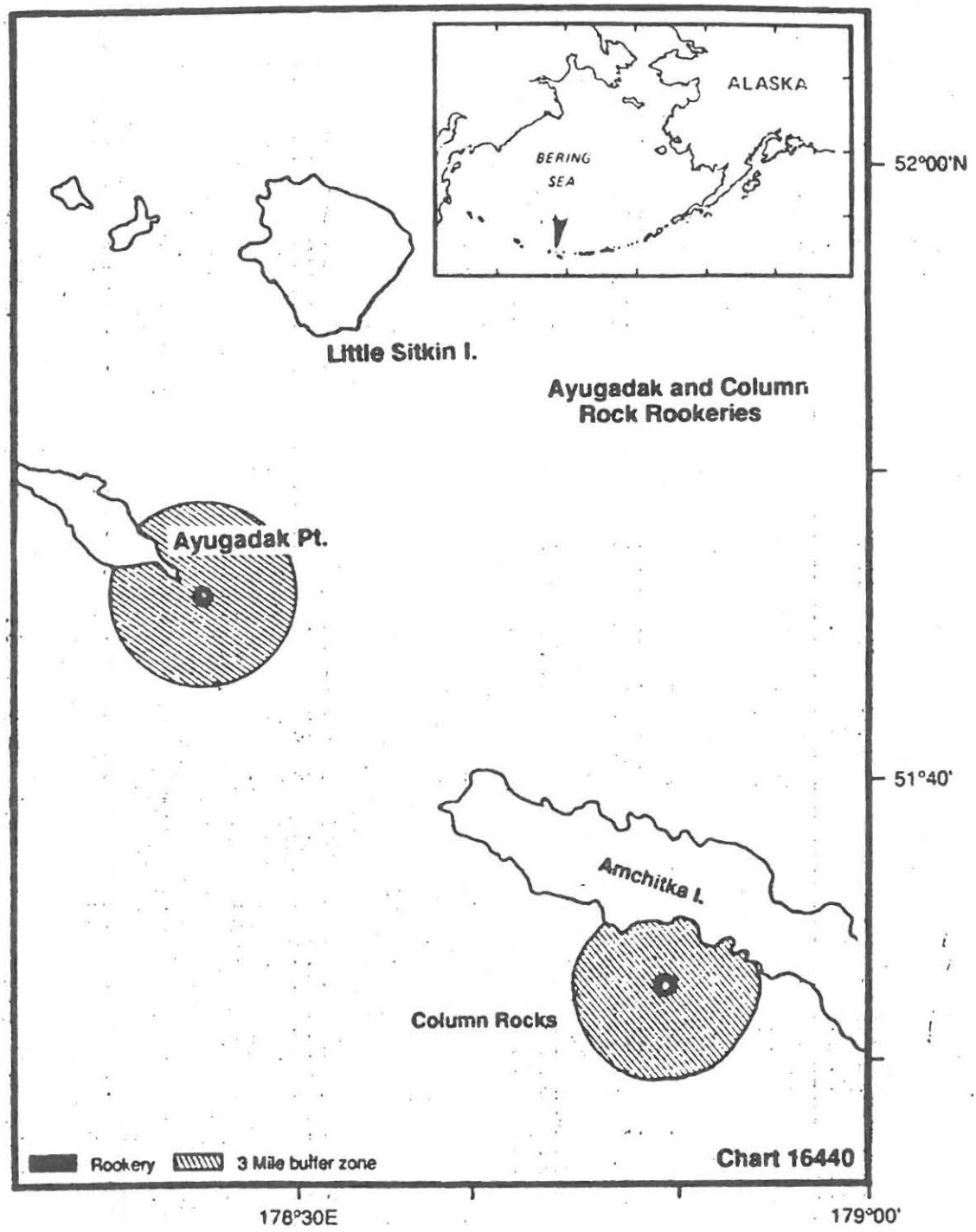
BERING SEA
52°10'N
Semisopochnoi Island Rookeries
Semisopochnoi I.
51°50'
Rookery
3 Mile buffer zone
Chart 16460
179°30'W
180°00'


ALASKA
BERING SEA
51°40'N
Amchitka Island Rookery
Amchitka I.
51°20'
Rookery
3 Mile buffer zone
Chart 16440
179°00'E
179°20'
179°40'


ALASKA
BERING SEA
52°00'N
Little Sitkin I.
Ayugadak and Column Rock Rookeries
Ayugadak Pt.
51°40'
Amchitka I.
Column Rocks
Rookery
3 Mile buffer zone
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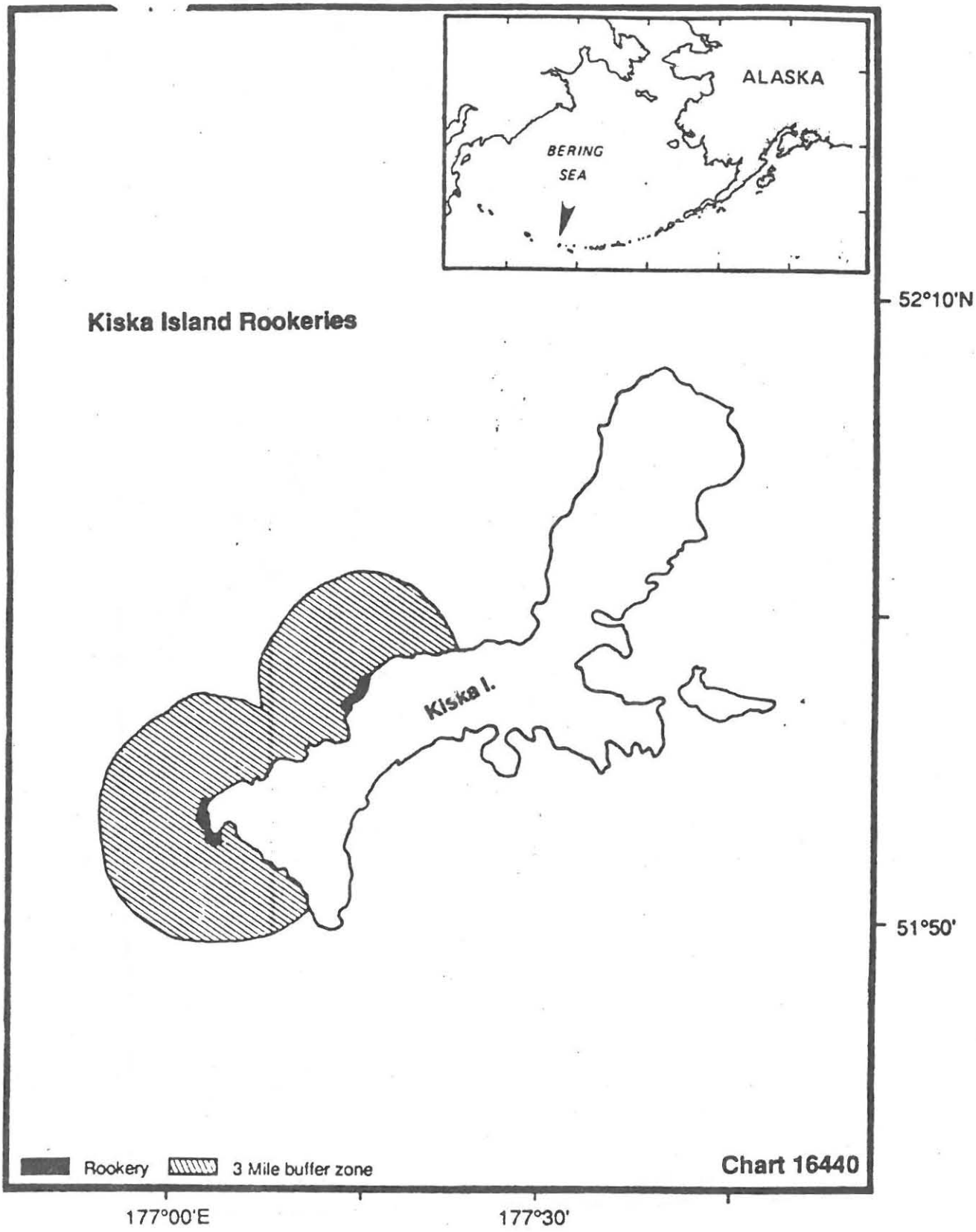
178°30E
179°00'


ALASKA
BERING SEA
Kiska Island Rookeries
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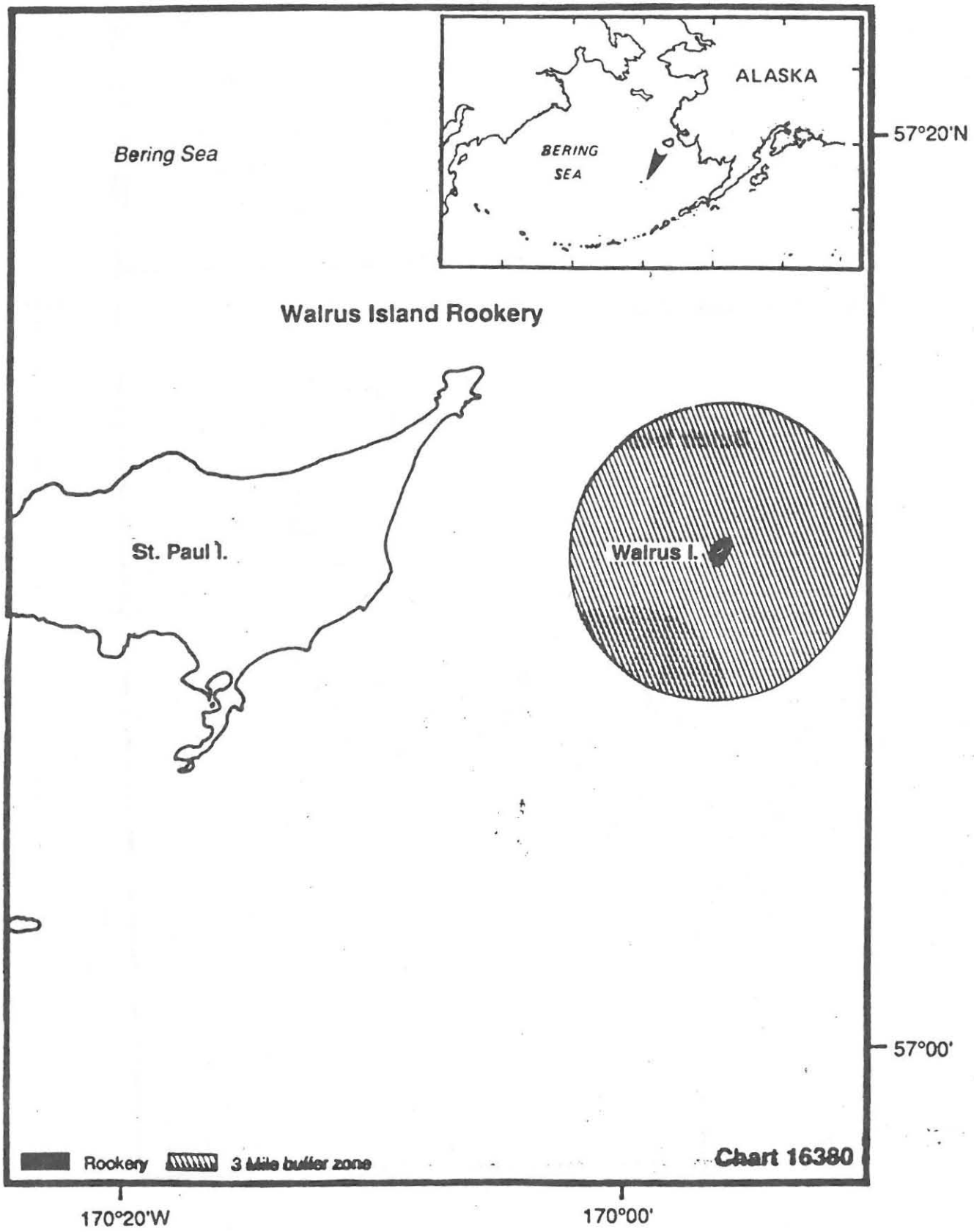
Kiska I.
51°50'
Rookery
3 Mile buffer zone
Chart 16440
177°00'E
177°30'


ALASKA
BERING SEA
Bering Sea
57°20'N
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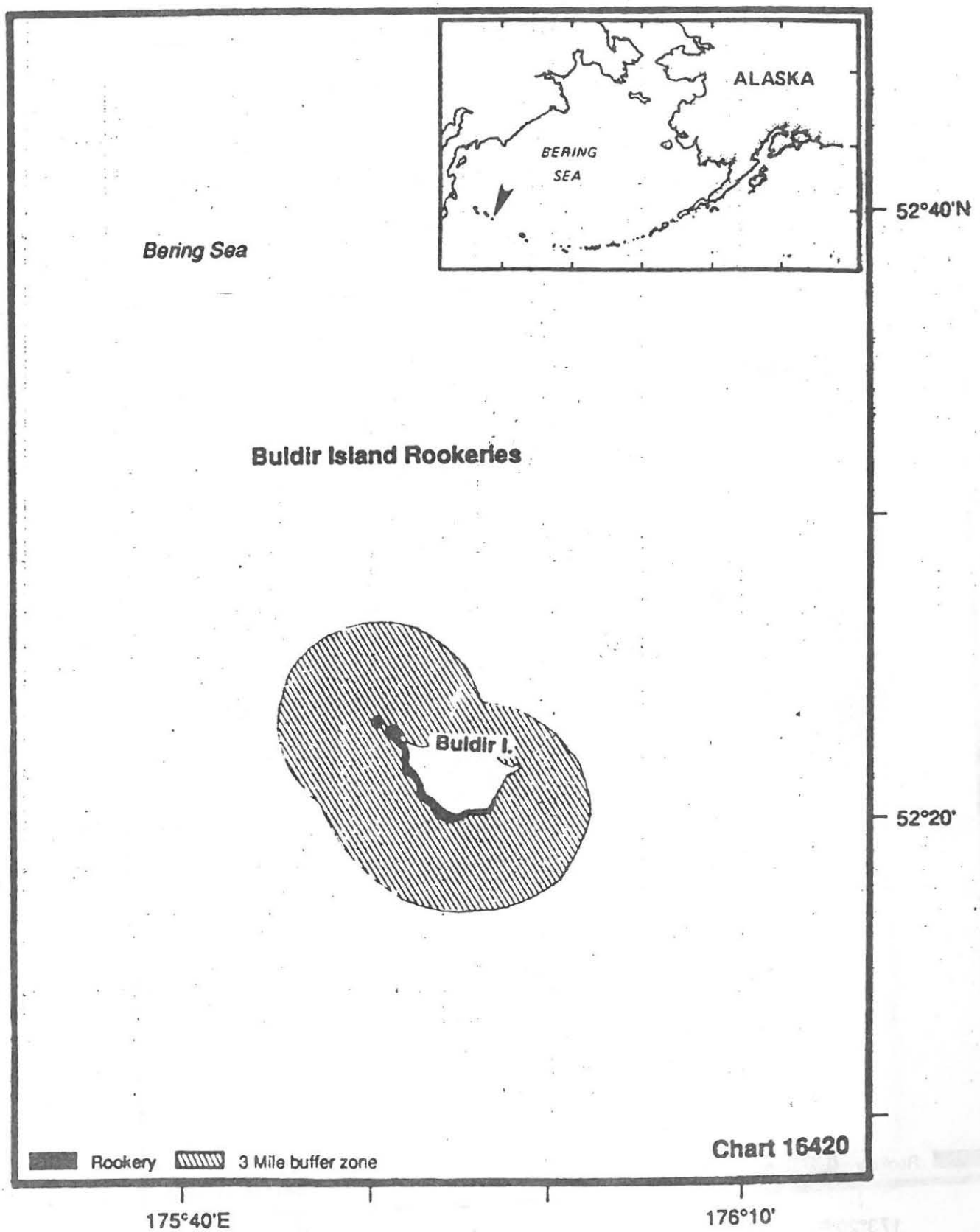
St. Paul I.
Walrus I.
57°00'
Rookery
3 Mile buffer zone
Chart 16380
170°20'W
170°00'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BERING SEA
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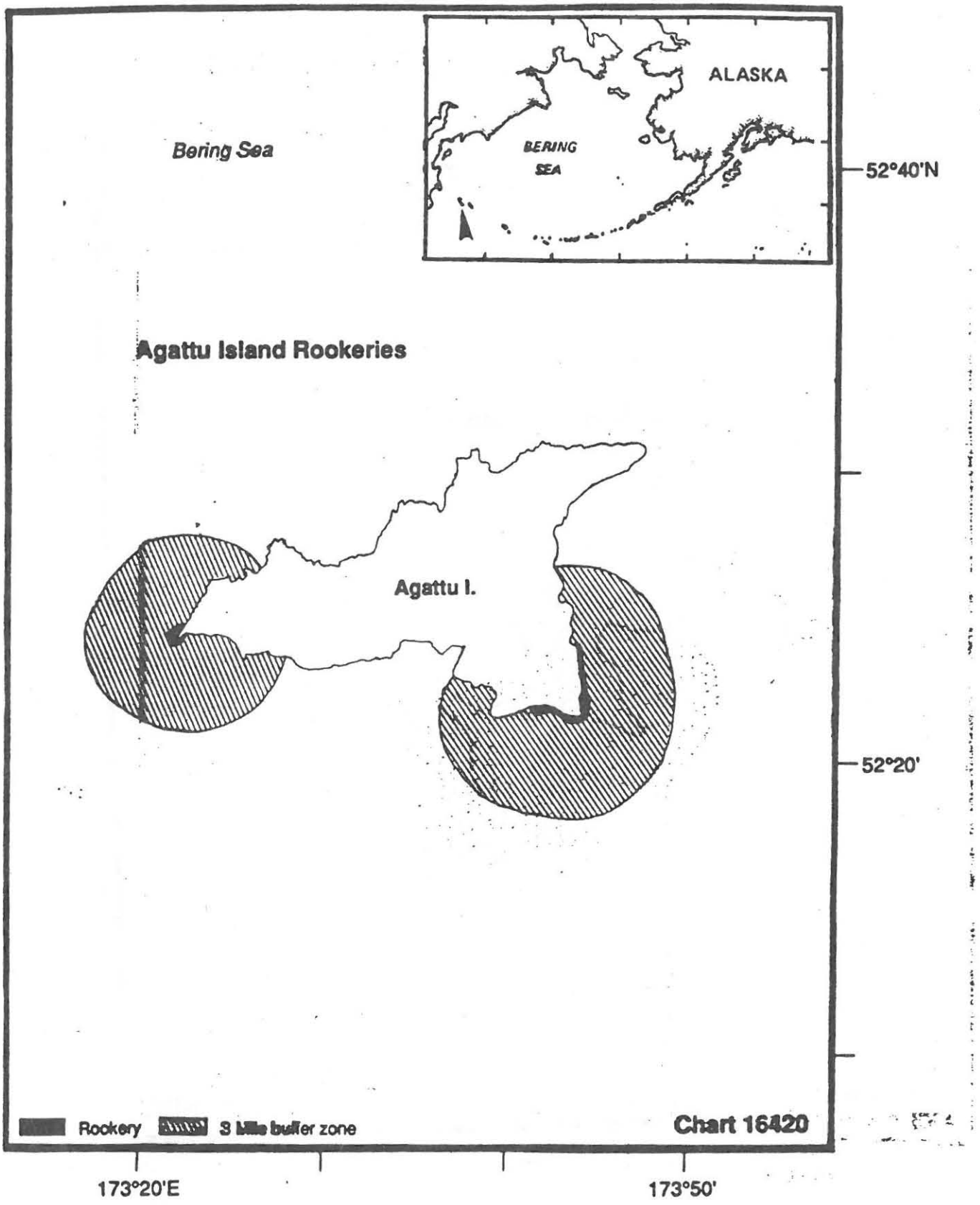
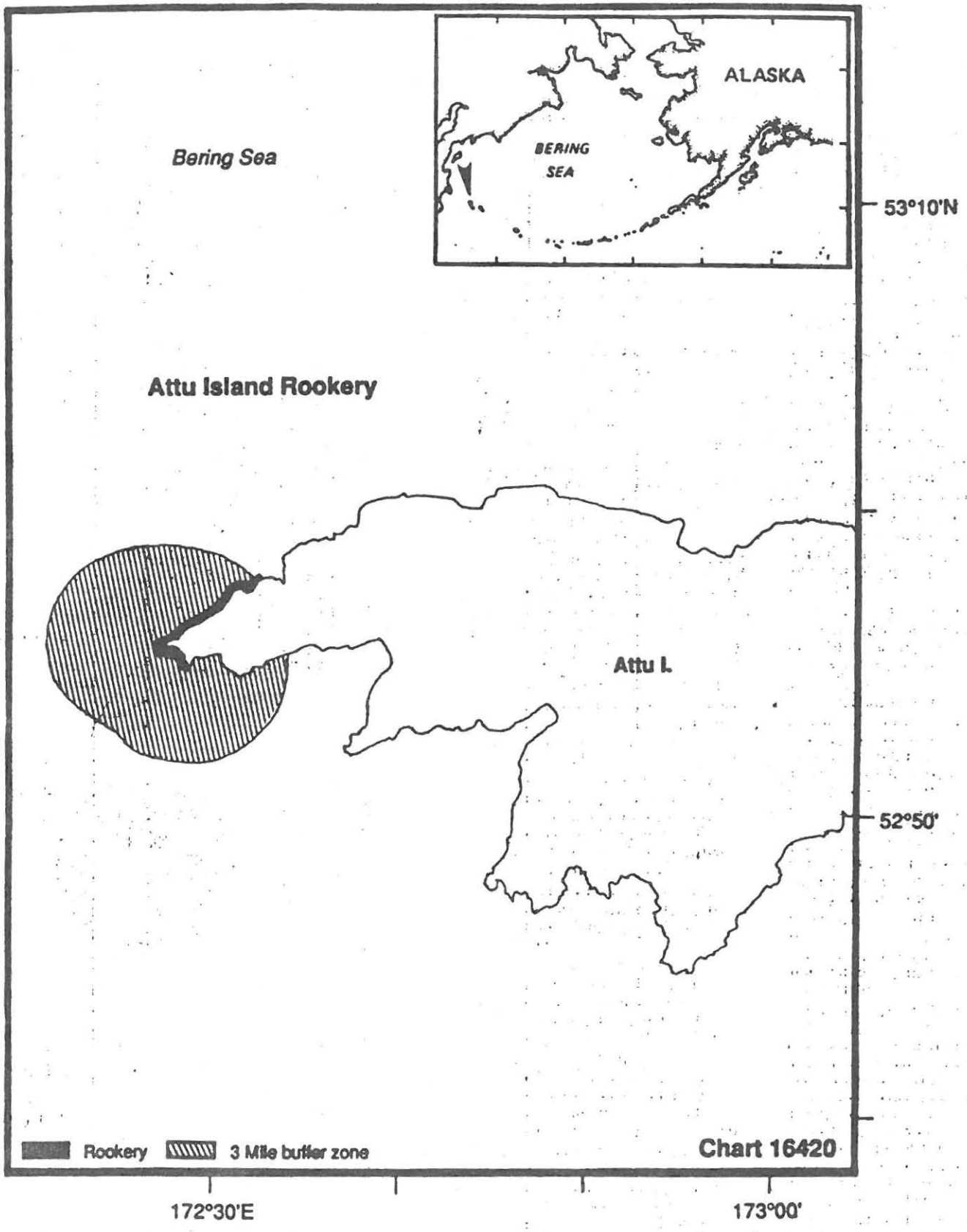
Buldir Island Rookeries
Buldir I.
52°20'
Rookery
3 Mile buffer zone
Chart 16420
175°40'E
176°10'


ALASKA
BERING SEA
Bering Sea
52°40'N
Agattu Island Rookeries
Agattu I.
52°20'
Rookery
3 Mile buffer zone
Chart 16420
173°20'E
173°50'



BILLING CODE 3510-22-C

(4) *Quota.* If the Assistant Administrator determines and publishes notice that 675 Steller sea lions have been killed incidentally in the course of commercial fishing operations in Alaskan waters and adjacent areas of the U.S. Exclusive Economic Zone (EEZ) west of 141° W longitude during any calendar year, then it will be unlawful to kill any additional Steller sea lions in this area. In order to monitor this quota, the Director, Alaska Region, National Marine Fisheries Service, may require the placement of an observer on any fishing vessel. If data indicate that the quota is being approached, the Assistant Administrator will issue emergency rules to establish closed areas, allocate the remaining quota among fisheries, or take other action(s) to ensure that commercial fishing operations do not exceed the quota.

(b) *Exceptions*—(1) *Permits.* The Assistant Administrator may issue permits authorizing activities that would otherwise be prohibited under paragraph (a) of this section in accordance with and subject to the provisions of 50 CFR part 222, subpart C—Endangered Fish or Wildlife Permits.

(2) *Official activities.* Paragraph (a) of this section does not prohibit or restrict a Federal, state or local government official, or his or her designee, who is acting in the course of official duties from:

(i) Taking a Steller sea lion in a humane manner, if the taking is for the protection or welfare of the animal, the protection of the public health and welfare, or the nonlethal removal of nuisance animals; or

(ii) Entering the buffer areas to perform activities that are necessary for national defense, or the performance of other legitimate governmental activities.

(3) *Subsistence takings by Alaska natives.* Paragraph (a)(1) of this section does not apply to the taking of Steller sea lions for subsistence purposes under section 10(e) of the Act.

(4) *Emergency situations.* Paragraph (a)(2) of this section does not apply to an emergency situation in which compliance with that provision presents a threat to the health, safety, or life of a person or presents a significant threat to the vessel or property.

(5) *Exemptions.* Paragraph (a)(2) of this section does not apply to any activity authorized by a prior written exemption from the Director, Alaska Region, National Marine Fisheries Service. Concurrently with the issuance of any exemption, the Assistant Administrator will publish notice of the exemption in the **Federal Register**. An exemption may be granted only if the activity will not have a significant adverse affect on Steller sea lions, the activity has been conducted historically or traditionally in the buffer zones, and there is no readily available and acceptable alternative to or site for the activity.

(c) *Penalties.* (1) Any person who violates this section or the Act is subject to the penalties specified in section 11 of the Act, and any other penalties provided by law.

(2) Any vessel used in violation of this section or the Endangered Species Act is subject to forfeiture under section 11(e)(4)(B) of the Act.

Dated: November 9, 1990.

William W. Fox, Jr.,

Assistant Administrator for Fisheries, National Oceanic and Atmospheric Administration.

[FR Doc. 90-27600 Filed 11-23-90; 8:45 am]

BILLING CODE 3510-22-M

Appendix C

Washington Administrative Codes

WAC 232-12-297, 232-12-011, 232-12-014

WAC 232-12-297 Endangered, threatened, and sensitive wildlife species classification.

PURPOSE

1.1 The purpose of this rule is to identify and classify native wildlife species that have need of protection and/or management to ensure their survival as free-ranging populations in Washington and to define the process by which listing, management, recovery, and delisting of a species can be achieved. These rules are established to ensure that consistent procedures and criteria are followed when classifying wildlife as endangered, or the protected wildlife subcategories threatened or sensitive.

DEFINITIONS

For purposes of this rule, the following definitions apply:

2.1 "Classify" and all derivatives means to list or delist wildlife species to or from endangered, or to or from the protected wildlife subcategories threatened or sensitive.

2.2 "List" and all derivatives means to change the classification status of a wildlife species to endangered, threatened, or sensitive.

2.3 "Delist" and its derivatives means to change the classification of endangered, threatened, or sensitive species to a classification other than endangered, threatened, or sensitive.

2.4 "Endangered" means any wildlife species native to the state of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state.

2.5 "Threatened" means any wildlife species native to the state of Washington that is likely to become an endangered species within the foreseeable future throughout a significant portion of its range within the state without cooperative management or removal of threats.

2.6 "Sensitive" means any wildlife species native to the state of Washington that is vulnerable or declining and is likely to become endangered or threatened in a significant portion of its range within the state without cooperative management or removal of threats.

2.7 "Species" means any group of animals classified as a species or subspecies as commonly accepted by the scientific community.

2.8 "Native" means any wildlife species naturally occurring in Washington for purposes of breeding, resting, or foraging, excluding introduced species not found historically in this state.

2.9 "Significant portion of its range" means that portion of a species' range likely to be essential to the long term survival of the population in Washington.

LISTING CRITERIA

3.1 The commission shall list a wildlife species as endangered, threatened, or sensitive solely on the basis of the biological status of the species being considered, based on the preponderance of scientific data available, except as noted in section 3.4.

3.2 If a species is listed as endangered or threatened under the federal Endangered Species Act, the agency will recommend to the commission that it be listed as endangered or threatened as specified in section 9.1. If listed, the agency will proceed with development of a recovery plan pursuant to section 11.1.

3.3 Species may be listed as endangered, threatened, or sensitive only when populations are in danger of failing, declining, or are vulnerable, due to factors including but not restricted to limited numbers, disease, predation, exploitation, or habitat loss or change, pursuant to section 7.1.

3.4 Where a species of the class Insecta, based on substantial evidence, is determined to present an unreasonable risk to public health, the commission may make the determination that the species need not be listed as endangered, threatened, or sensitive.

DELISTING CRITERIA

4.1 The commission shall delist a wildlife species from endangered, threatened, or sensitive solely on the basis of the biological status of the species being

considered, based on the preponderance of scientific data available.

4.2 A species may be delisted from endangered, threatened, or sensitive only when populations are no longer in danger of failing, declining, are no longer vulnerable, pursuant to section 3.3, or meet recovery plan goals, and when it no longer meets the definitions in sections 2.4, 2.5, or 2.6.

INITIATION OF LISTING PROCESS

5.1 Any one of the following events may initiate the listing process.

5.1.1 The agency determines that a species population may be in danger of failing, declining, or vulnerable, pursuant to section 3.3.

5.1.2 A petition is received at the agency from an interested person. The petition should be addressed to the director. It should set forth specific evidence and scientific data which shows that the species may be failing, declining, or vulnerable, pursuant to section 3.3. Within 60 days, the agency shall either deny the petition, stating the reasons, or initiate the classification process.

5.1.3 An emergency, as defined by the Administrative Procedure Act, chapter 34.05 RCW. The listing of any species previously classified under emergency rule shall be governed by the provisions of this section.

5.1.4 The commission requests the agency review a species of concern.

5.2 Upon initiation of the listing process the agency shall publish a public notice in the Washington Register, and notify those parties who have expressed their interest to the department, announcing the initiation of the classification process and calling for scientific information relevant to the species status report under consideration pursuant to section 7.1.

INITIATION OF DELISTING PROCESS

6.1 Any one of the following events may initiate the delisting process:

6.1.1 The agency determines that a species population may no longer be in danger of failing, declining, or vulnerable, pursuant to section 3.3.

6.1.2 The agency receives a petition from an interested person. The petition should be addressed to the director. It should set forth specific evidence and scientific data which shows that the species may no longer be failing, declining, or vulnerable, pursuant to section 3.3. Within 60 days, the agency shall either deny the petition, stating the reasons, or initiate the delisting process.

6.1.3 The commission requests the agency review a species of concern.

6.2 Upon initiation of the delisting process the agency shall publish a public notice in the Washington Register, and notify those parties who have expressed their interest to the department, announcing the initiation of the delisting process and calling for scientific information relevant to the species status report under consideration pursuant to section 7.1.

SPECIES STATUS REVIEW AND AGENCY RECOMMENDATIONS

7.1 Except in an emergency under 5.1.3 above, prior to making a classification recommendation to the commission, the Agency shall prepare a preliminary species status report. The report will include a review of information relevant to the species' status in Washington and address factors affecting its status, including those given under section 3.3. The status report shall be reviewed by the public and scientific community. The status report will include, but not be limited to an analysis of:

7.1.1 Historic, current, and future species population trends

7.1.2 Natural history, including ecological relationships (e.g. food habits, home range, habitat selection patterns).

7.1.3 Historic and current habitat trends.

7.1.4 Population demographics (e.g. survival and mortality rates, reproductive success) and their relationship to long term sustainability.

7.1.5 Historic and current species management activities.

7.2 Except in an emergency under 5.1.3 above, the agency shall prepare recommendations for species classification, based upon scientific data contained in the status report. Documents shall be prepared to determine the environmental consequences of adopting the recommendations pursuant to requirements of the State Environmental Policy Act (SEPA).

7.3 For the purpose of delisting, the status report will include a review of recovery plan goals.

PUBLIC REVIEW

8.1 Except in an emergency under 5.1.3 above, prior to making a recommendation to the commission, the agency shall provide an opportunity for interested parties to submit new scientific data relevant to the status report, classification recommendation, and any SEPA findings.

8.1.1 The agency shall allow at least 90 days for public comment.

8.1.2 The agency will hold at least one public meeting in each of its administrative regions during the public review period.

FINAL RECOMMENDATIONS AND COMMISSION ACTION

9.1 After the close of the public comment period, the agency shall complete a final status report and classification recommendation. SEPA documents will be prepared, as necessary, for the final agency recommendation for classification. The classification recommendation will be presented to the commission for action. The final species status report, agency classification recommendation, and SEPA documents will be made available to the public at least 30 days prior to the commission meeting.

9.2 Notice of the proposed commission action will be published at least 30 days prior to the commission meeting.

PERIODIC SPECIES STATUS REVIEW

10.1 The agency shall conduct a review of each endangered, threatened, or sensitive wildlife species at least every five years after the date of its listing. This review shall include an update of the species status report to determine whether the status of the species warrants its current listing status or deserves reclassification.

10.1.1 The agency shall notify any parties who have expressed their interest to the department of the periodic status review. This notice shall occur at least one year prior to end of the five year period required by section 10.1.

10.2 The status of all delisted species shall be reviewed at least once, five years following the date of delisting.

10.3 The department shall evaluate the necessity of changing the classification of the species being reviewed. The agency shall report its findings to the commission at a commission meeting. The agency shall notify the public of its findings at least 30 days prior to presenting the findings to the commission.

10.3.1 If the agency determines that new information suggests that classification of a species should be changed from its present state, the agency shall initiate classification procedures provided for in these rules starting with section 5.1.

10.3.2 If the agency determines that conditions have not changed significantly and that the classification of the species should remain unchanged, the agency shall recommend to the commission that the species being reviewed shall retain its present classification status.

10.4 Nothing in these rules shall be construed to automatically delist a species without formal commission action.

RECOVERY AND MANAGEMENT OF LISTED SPECIES

11.1 The agency shall write a recovery plan for species listed as endangered or threatened. The agency will write a management plan for species listed as sensitive. Recovery and management plans shall address the listing criteria described in sections 3.1 and 3.3, and shall include, but are not limited to:

11.1.1 Target population objectives

11.1.2 Criteria for reclassification

11.1.3 An implementation plan for reaching population objectives which will promote cooperative management and be sensitive to landowner needs and property rights. The plan will specify resources needed from and impacts to the Department, other agencies (including federal, state, and local), tribes, landowners, and other interest groups. The plan shall consider various approaches to meeting recovery objectives including, but not limited to regulation, mitigation, acquisition, incentive, and compensation mechanisms.

11.1.4 Public education needs

11.1.5 A species monitoring plan, which requires periodic review to allow the incorporation of new information into the status report.

11.2 Preparation of recovery and management plans will be initiated by the agency within one year after the date of listing.

11.2.1 Recovery and management plans for species listed prior to 1990 or during the five years following the adoption of these rules shall be completed within 5 years after the date of listing or adoption of these rules, whichever comes later. Development of recovery plans for endangered species will receive higher priority than threatened or sensitive species.

11.2.2 Recovery and management plans for species listed after five years following the adoption of these rules shall be completed within three years after the date of listing.

11.2.3 The agency will publish a notice in the Washington Register and notify any parties who have expressed interest to the department interested parties of the initiation of recovery plan development.

11.2.4 If the deadlines defined in sections 11.2.1 and 11.2.2 are not met the department shall notify the public and report the reasons for missing the deadline and the strategy for completing the plan at a

commission meeting. The intent of this section is to recognize current department personnel resources are limiting and that development of recovery plans for some of the species may require significant involvement by interests outside of the department, and therefore take longer to complete.

11.3 The agency shall provide an opportunity for interested public to comment on the recovery plan and any SEPA documents.

CLASSIFICATION PROCEDURES REVIEW

12.1 The agency and an ad hoc public group with members representing a broad spectrum of interests, shall meet as needed to accomplish the following:

12.1.1 Monitor the progress of the development of recovery and management plans and status reviews, highlight problems, and make recommendations to the department and other interested parties to improve the effectiveness of these processes.

12.1.2 Review these classification procedures six years after the adoption of these rules and report its findings to the commission.

AUTHORITY

13.1 The commission has the authority to classify wildlife as endangered under RCW 77.12.020. Species classified as endangered are listed under WAC 232-12-014, as amended.

13.2 Threatened and sensitive species shall be classified as subcategories of protected wildlife. The commission has the authority to classify wildlife as protected under RCW 77.12.020. Species classified as protected are listed under WAC 232-12-011, as amended.

[Statutory Authority: RCW 77.12.020. 90-11-066 (Order 442), § 232-12-297, filed 5/15/90, effective 6/15/90.]

WAC 232-12-011 Wildlife classified as protected shall not be hunted or fished. Protected wildlife are designated into three subcategories: Threatened, sensitive, and other.

(1) Threatened species are any wildlife species native to the state of Washington that are likely to become endangered within the foreseeable future throughout a significant portion of their range within the state without cooperative management or removal of threats.

Protected wildlife designated as threatened include ferruginous hawk, *Buteoregalis*; bald eagle, *Haliaectus leucocephalus*; western pond turtle, *Clemmys marmorata*; green sea turtle, *Cheloniia mydas*; loggerhead sea turtle, *Caretta caretta*; Oregon silverspot butterfly, *Speyeria zerene hippolyta*; pygmy rabbit, *Brachylagus idahoensis*.

(2) Sensitive species are any wildlife species native to the state of Washington that are vulnerable or declining and are likely to become endangered or threatened in a significant portion of their range within the state without cooperative management or removal of threats.

(3) Other protected wildlife.

Other protected wildlife include all birds not classified as game birds, predatory birds, or endangered species[,] or designated as threatened species or sensitive species; and fur seal, *Callorhinus ursinus*; fisher, *Martes pennanti*; wolverine, *Gulo luscus*; western gray squirrel, *Sciurus griseus*; Douglas squirrel, *Tamiasciurus douglasii*; red squirrel, *Tamiasciurus hudsonicus*; flying squirrel, *Glaucomys sabrinus*; golden-mantled ground squirrel, *Callospermophilus saturatus*; chipmunks, *Eutamias*; cony or pika, *Ochotona princeps*; hoary marmot, *Marmota caligata* and *olympus*; all wild turtles not otherwise classified as endangered species, or designated as threatened species or sensitive species; mammals of the order *Cetacea*, including whales, porpoises, and mammals of the suborder *Pinnipedia* not otherwise classified as endangered species, or designated as threatened species or sensitive species. This section shall not apply to hair seals and sea lions which are threatening to damage or are damaging commercial fishing gear being utilized in a lawful manner or when said mammals are damaging or threatening to damage commercial fish being lawfully taken with commercial gear.

[Statutory Authority: RCW 77.12.020. 90-11-065 (Order 441), § 232-12-011, filed 5/15/90, effective 6/15/90. Statutory Authority: RCW 77.12.040. 89-11-061 (Order 392), § 232-12-011, filed 5/18/89; 82-19-026 (Order 192), § 232-12-011, filed 9/9/82; 81-22-002 (Order 174), § 232-12-011, filed 10/22/81; 81-12-029 (Order 165), § 232-12-011, filed 6/1/81.]

Reviser's note: RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffectual changes not filed by the agency in this manner. The bracketed material in the above section does not appear to conform to the statutory requirement.

WAC 232-12-014 Wildlife classified as endangered species. Endangered species include: Columbian white-tailed deer, *Odocoileus virginianus leucurus*; Mountain caribou, *Rangifer tarandus*; Blue whale, *Balaenoptera musculus*; Bowhead whale, *Balaena mysticetus*; Finback whale, *Balaenoptera physalus*; Gray whale, *Eschrichtius gibbosus*; Humpback whale, *Megaptera novaeangliae*; Right whale, *Balaena glacialis*; Sei whale, *Balaenoptera borealis*; Sperm whale, *Physeter catodon*; Wolf, *Canis lupus*; Peregrine falcon, *Falco peregrinus*; Aleutian Canada goose, *Branta canadensis luecopareia*; Brown pelican, *Pelecanus occidentalis*; Leatherback sea turtle, *Dermochelys coriacea*; Grizzly bear, *Ursus arctos horribilis*; Sea Otter, *Enhydra lutris*; White pelican, *Pelecanus erythrorhynchos*; Sandhill crane, *Grus canadensis*; Snowy plover, *Charadrius alexandrinus*; Upland sandpiper, *Bartramia longicauda*; Northern spotted owl, *Strix occidentalis*.

[Statutory Authority: RCW 77.12.020(6). 88-05-032 (Order 305), § 232-12-014, filed 2/12/88. Statutory Authority: RCW 77.12.040. 82-19-026 (Order 192), § 232-12-014, filed 9/9/82; 81-22-002 (Order 174), § 232-12-014, filed 10/22/81; 81-12-029 (Order 165), § 232-12-014, filed 6/1/81.]

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