UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

AUG 20 2004

Dear Reviewer:

In accordance with provisions of the National Environmental Policy Act of 1969 (NEPA), we enclose for your review the Draft Environmental Impact Statement (DEIS) for Setting the Annual Subsistence Harvest of Northern Fur Seals on the Pribilof Islands. The DEIS is also available on the National Marine Fisheries Service, Alaska Region, website at www.fakr.noaa.gov. Additional printed or CD copies of the DEIS may be ordered from this website.

The Alaska Region has prepared this DEIS to address the Federal action of establishing annual subsistence harvest levels for Northern fur seals on the Pribilof Islands, as required by current regulations (50 CFR 216.72(b)). The preferred alternative would maintain the harvest at the same ranges that were established for the previous three year period (2000-2002): 1,645 - 2,000 seals for St. Paul Island and 300-500 seals for St. George Island. These ranges, through close consultation with the Tribal Governments of St. Paul and St. George Islands, have been determined as adequate to meet the local subsistence needs for the Aleut community living in the Pribilof Islands.

Comments or questions on the DEIS submitted during the 45-day public comment period must be received October 19, 2004. Written comments should be submitted by mail to James W. Balsiger, Administrator, Alaska Region, National Marine Fisheries Service, P.O. Box 21668, Juneau, Alaska 99802-1668. Faxed comments will not be accepted. Electronic comments may be submitted by email to furseal.eis@noaa.gov. A copy of your comments should be submitted to me via mail to the NOAA Strategic Planning Office (PPI/SP), SSMC3, Room 15603, 1315 East-West Highway, Silver Spring, Maryland 20910; or by email to neap.comments@noaa.gov.

Sincerely,

Susan A. Kennedy
Acting NEPA Coordinator

Enclosure

SETTING THE ANNUAL SUBSISTENCE HARVEST OF NORTHERN FUR SEALS ON THE PRIBILOF ISLANDS

DRAFT ENVIRONMENTAL IMPACT STATEMENT

August 2004

Lead Agency: **National Oceanic and Atmospheric Administration**
National Marine Fisheries Service
Alaska Region
Juneau, Alaska

Responsible Official: **James A. Balsiger**
Alaska Regional Administrator
National Marine Fisheries Service

For Further Information Contact: **Alaska Regional Office**
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802
(907) 586-7235

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Lead Agency: National Oceanic and Atmospheric Administration
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Abstract: Regulations at 50 CFR 216.72(b) require the Assistant Administrator (AA) for Fisheries to determine and publish the take ranges for the Pribilof Islands subsistence harvest of northern fur seals every three years. The purpose of this proposed action is to set the annual Pribilof Islands fur seal subsistence take ranges as required by regulations. The primary issues are potential impacts to the fur seal population, effects on subsistence culture and traditions, and potential impacts to other subsistence species (e.g. Steller sea lions, harbor seals). The preferred alternative maintains the same take ranges as were established for the three year period 2000-2002 and will have no significant effect on other resources. The current range for St. Paul Island is 1,645 - 2,000 seals; the range for St. George Island is 300-500 seals. These ranges (and co-management agreements) were developed through close consultation with the Tribal Governments of St. Paul and St. George Islands and have been determined as adequate to meet the local subsistence needs for the Aleut community living in the Pribilof Islands.

Comments on the draft Environmental Impact Statement must be received in the Alaska Region by October 19, 2004.

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ABBREVIATIONS AND ACRONYMS

AA	Assistant Administrator for Fisheries
ANO	Alaskan Native Organization
BSAI	Bering Sea and Aleutian Islands
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act
EA	Environmental Assessment
EBS	Eastern Bering Sea
EIS	Environmental Impact Statement
E.O.	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act, as amended
FONSI	Finding of No Significant Impact
FSA	Fur Seal Act
MMPA	Marine Mammal Protection Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
RFA	Regulatory Flexibility Act
U.S.C.	United States Code
MNPL	Maximum Net Productivity Level
FR	Federal Register
K	Carrying Capacity
P.L.	Public Law

Executive Summary

Description of the Proposed Action

Following the termination of the commercial harvest, NMFS issued an emergency interim rule on July 8, 1985, to govern the subsistence taking of fur seals for the 1985 season under the authority of section 105(a) of the Fur Seal Act. A final rule was published on July 9, 1985. The subsistence harvest of northern fur seals on the Pribilof Islands, Alaska, is governed by regulations found in 50 CFR part 216 subpart F--Taking for Subsistence Purposes. These regulations were published under the authority of the Fur Seal Act, 16 U.S.C. 1151, *et seq*., and the MMPA, 16 U.S.C. 1361, *et seq*. (see 51 FR 24828, July 9, 1986). The purpose of these regulations was to limit the take of fur seals to a level providing for the subsistence needs of the Pribilof Aleuts using humane harvesting methods, and to restrict taking by sex, age, and season for herd management purposes.

Since the first Aleuts were brought to the islands in the late 1700s, fur seal meat has been a dietary staple. The Pribilof Aleuts use many parts of the fur seal for food. The number of seals estimated to be needed for subsistence purposes has varied dramatically since 1985, ranging from greater than 15,000 per year (upper limit in the 1985 EIS), to the current estimate of less than 2,000 when both islands are combined. Alaska Natives residing on the Pribilof Islands are allowed an annual subsistence harvest of northern fur seals, with a take range determined from annual household surveys. The estimate of subsistence needs for fur seals on the Pribilofs provided in the preamble to the 1985 interim rule ranged from 3,358 to more than 15,000. These estimates were derived from a variety of historical records and extrapolations based on subsistence use and the actual numbers harvested never approached the upper estimate of need. A total of 3, 713 seals were harvested in 1985. The harvest report was published in the Marine Fisheries Review in 1986. The actual number needed and the manner in which the seals were taken was the subject of controversy between the cessation of the commercial harvest and the early 1990s, resulting in litigation between NMFS and conservation groups over this practice. Since 1995, the harvest has stabilized and the harvest is not controversial.

The proposed action is to set the annual Pribilof Islands fur seal subsistence take ranges as required by regulations at 50 CFR 216.72(b). This action continues the process begun in 1986 and modified in 1994, and will establish the number of seals that may be taken by Alaskan Native (Aleut) residents annually on the Pribilof Islands. The primary issues are potential impacts to the fur seal population, effects on subsistence culture and traditions, and potential impacts to other subsistence species (e.g. Steller sea lions, harbor seals). The preferred alternative maintains the same take ranges as were established for the three year period 2000 - 2002 and will have no significant effect on other resources. These ranges (and co-management agreements) were developed through close consultation with the Tribal Governments of St. Paul and St. George Islands and have been determined as adequate to meet the local subsistence needs for the Aleut community living in the Pribilof Islands.

Alternatives Considered

The following four alternatives have been identified regarding this action:

Alternative 1: Status Quo- NMFS would continue to set subsistence harvest limits at 2,500 northern fur seals, with up to 2,000 harvested from St. Paul and 500 harvested from St. George. These are the same levels established in 1997. This is the preferred alternative and the environmentally- preferred alternative.

Alternative 2: No Action- NMFS would not set the take ranges as required by Regulations at 50 CFR 216.72(b).

Alternative 3: Potential Biological Removal level (PBR)- Set the subsistence harvest limit equal to the PBR, which is 16,162 northern fur seals, with up to 12,930 harvested from St. Paul and up to 3,232 harvested from St. George.

Alternative 4: 5 year average- Set the harvest limit to the most recent five-year average (1999-2003) of the actual harvest. This would set the subsistence harvest limit to 872 northern fur seals, with up to 705 harvested from St. Paul and 167 harvested from St. George.

Summary of Major Environmental Impacts

Alternative 1- Status Quo- would have a minimal effect on the northern fur seal stock. It would meet the documented subsistence needs of the Aleuts on St. Paul and St. George Islands. Alternative 1 will have an insignificant effect on benthic habitats, essential fish habitat, seabirds, wild and scenic rivers, wetlands, ecologically critical areas, other marine mammals, other wildlife, or water quality.
Alternative 2 - No Action- would not affect the northern fur seal stock. It would have an adverse effect on the documented subsistence needs of the Aleuts on St. Paul and St. George Islands, and adversely affect future co-management. If subsistence users switch to other species, Alternative 2 could adversely affect local Steller sea lion, and harbor seal stocks. Alternative 2 will have an insignificant effect on benthic habitats, essential fish habitat, seabirds, wild and scenic rivers, wetlands, ecologically critical areas, other marine mammals (except Steller sea lions and harbor seals), other wildlife, or water quality.

Alternative 3 - take levels equal to PBR- could adversely affect the northern fur seal stock. It may reduce harvest of Steller sea lion and harbor seal stocks and have an indirect conditionally significant beneficial effect on Steller sea lion and harbor seal stocks. Alternative 3 would meet the documented subsistence needs of the Aleuts on St. Paul and St. George Islands. Alternative 3 will have an insignificant effect on benthic habitats, essential fish habitat, seabirds, wild and scenic rivers, wetlands, ecologically critical areas, other marine mammals, other wildlife, or water quality.

Alternative 4 - take levels equal to the 5-year average- would have a minimal effect on the

northern fur seal stock. It could have a conditionally significant adverse effect on the documented subsistence needs of the Aleuts on St. Paul and St. George Islands, and adversely affect future co-management. If subsistence users switch to other species, Alternative 4 could conditionally adversely affect local Steller sea lion, and harbor seal stocks. Alternative 4 will have an insignificant effect on benthic habitats, essential fish habitat, seabirds, wild and scenic rivers, wetlands, ecologically critical areas, other marine mammals (except Steller sea lions and harbor seals), other wildlife, or water quality.

Cumulative Impacts

Commercial Harvest of Fur Seals

The commercial harvest of fur seals was a major source of human-induced mortality for more than 200 years, and the abundance of fur seals has fluctuated greatly in the past, largely due to this commercial harvest (NMFS 1993). Commercial harvest of fur seals peaked during 1961 with more than 126,000 animals harvested, and the commercial harvest of fur seals ended in 1985 (NMFS 1993). The northern fur seal was listed as a depleted stock under the Marine Mammal Protection Act (MMPA) in 1988 as a result of the steep decline in numbers (NMFS 1993).

The harvest historically had a significant adverse effect; however, it is doubtful that the current trends in fur seal numbers can be attributed to the residual effects of the commercial harvest. There are no effects for all four alternatives.

Regime Shifts or Environmental Change

Large scale and pronounced changes within the Bering Sea ecosystem have occurred over the last two decades. These changes are thought to be driven in large part by climatic change, in particular the Pacific Decadal Oscillation (PDO). The present and predicted effects associated with climate change or regime shifts on northern fur seals and their prey are not well known, but are likely based on the seals' wide distribution in the Bering Sea and Aleutian Islands (BSAI) and Eastern Bering Sea (EBS) which make them susceptible to such large-scale regional change. Given recent declining trends in fur seal abundance and the unknown but likely relationship between these trends and environmental changes, these effects are considered significant adverse for all four alternatives.

Commercial Fishing

The DEIS results in a conditionally significant adverse cumulative effects finding, in that the preferred alternative would contribute to the cumulative impact on fur seals to a point considered conditionally significant adverse. Much of this finding is associated with potential, yet poorly known, effects of past, present, and future commercial fishing activity. NMFS has determined commercial fishing in the Bering Sea may have potential negative effects on availability of fur seal prey, based primarily on the overlap of the groundfish fisheries with fur seal foraging ranges. These potential effects have been found to be conditionally significant adverse (NMFS, 2001), and would be considered controversial.

Historical impacts on northern fur seals due to incidental mortality in fisheries, especially from foreign fisheries, have been considerable and likely contributed to population declines. Present and predicted effects include mortality while these animals are outside the exclusive economic zone (EEZ) and small levels of take in State-managed gillnet fisheries. Generally, however, the incidental take of northern fur seals at this time is uncommon in groundfish fisheries. The last recorded mortality in any Alaskan groundfish fishery occurred in 1996, when the take rate was one animal per 1,862,573 mt of groundfish harvested. This level of take contributes little to the northern fur seal PBR of 16,162 (Angliss and Lodge 2003) and is inconsequential to population trends for all alternatives.

Entanglement in marine debris is more common in fur seals than any other species of marine mammal in Alaskan waters (Laist, 1987, 1997; Fowler, 1988). Mortality of northern fur seals from entanglement in marine debris contributed significantly to declining trends in the Pribilof Islands during mid to late 1970s and early 1980s (Fowler, 1988). The contribution of the groundfish fishery is thought to be less than in previous years and, at this time, is considered insignificant (NMFS 2001) for all alternatives.

The potential for disturbance effects caused by vessel traffic, fishing gear, or noise appears limited for northern fur seals. A cumulative effect might be identified for such disturbance but, lacking information on the actual effect of disturbance, was considered unknown for all alternatives.

Areas of Controversy

The current subsistence harvest level of northern fur seals on the Pribilof Islands is not considered controversial.

This DEIS results in a conditionally significant adverse cumulative effects finding, in that the preferred alternative would contribute to the cumulative impact on fur seals to a point considered conditionally significant adverse. Much of this finding is associated with potential, yet poorly known, effects of past, present, and future commercial fishing activity. NMFS has determined commercial fishing in the Bering Sea may have potential negative effects on availability of fur seal prey, based primarily on the overlap of the groundfish fisheries with fur seal foraging ranges. These potential effects have been found to be conditionally significant adverse (NMFS, 2001), and would be considered controversial.

Selection of Alternatives 2 or 4 would have a direct and likely adverse effect on the human (subsistence communities) environment of the Pribilof Islands resulting from delay and/or restrictions on the annual subsistence harvest. Alternative 3 (PBR 16,162) may be a high enough level of harvest to have a conditionally significant adverse effect and impede the recovery of, or hasten the decline of the northern fur seal population.

Issues to be Resolved

A balance will be struck between the two major issues of meeting Native subsistence needs and other impacts to the environment affecting the northern fur seal population.

Chapter 1 Purpose and Need for Action

The commercial harvesting of northern fur seals (*Callorhinus ursinus*) on the Pribilof Islands, Alaska, began shortly after the discovery of the Islands in 1786. The commercial harvest was continued by the United States when the Pribilof Islands came under U.S. jurisdiction with the purchase of Alaska from Russia in 1867. On October 14, 1984, the Interim Convention on the Conservation of Northern Fur Seals, which authorized the commercial harvest, expired and the U.S. Congress failed to ratify a new treaty extension. Since domestic law did not provide for a commercial harvest of marine mammals in the U.S., the commercial harvest of northern fur seals was terminated.

On July 8, 1985, the National Marine Fisheries Service (NMFS) published an emergency interim rule to govern the subsistence taking of fur seals by Alaskan Native (Aleut) residents of the Pribilof Islands under authority of section 105(a) of the Fur Seal Act (FSA). A final rule was subsequently published on July 9, 1986 (51 FR 24828). The subsistence harvest of northern fur seals on the Pribilof Islands is governed by regulations at 50 CFR 216 Subpart F--Pribilof Islands, Taking for Subsistence Purposes. These regulations were published under the authority of the Fur Seal Act (FSA), 16 U.S.C. 1151, *et seq*., and the Marine Mammal Protection Act (MMPA), 16 U.S.C. 1361, *et seq*. (see 51 FR 24828, July 9, 1986). The MMPA was amended in 1994 to provide that the Federal government may enter into cooperative agreements with Alaska Native Organizations to conserve marine mammals and provide co-management of subsistence uses by Alaska Natives. NMFS has entered into such agreements (co-management agreements) with the tribal governments of St. Paul and St. George Islands (see appendices A and B). Presently, these agreements provide for shared responsibilities over subsistence harvests. The tribal governments have expressed interest in a more comprehensive cooperative management regime for the Northern fur seal, which would include shared responsibility for setting harvest limits, research, and addressing conservation issues such as habitat protection and the effects of commercial fishing on this stock.

1.1 Purpose and Need

The proposed action is to set the annual Pribilof Islands fur seal subsistence take ranges as required by regulations at 50 CFR 216.72(b). This action continues the process begun in 1986 and modified in 1994, and will establish the number of seals that may be taken by Alaskan Native (Aleut) residents annually on the Pribilof Islands. There is a need for the long term sustainable use of these animals for cultural continuity, food, clothing, arts, and crafts.

1.2 Related NEPA Documents

On April 2, 1985, NMFS published a final environmental impact statement (EIS) on the future of the Interim Convention on Conservation of Northern Fur Seals which contained a discussion of four alternatives, including allowing the Convention to expire which finally became the preferred alternative. This alternative contained a discussion of the consequences of a subsistence harvest on the Pribilof Islands.

On May 12, 1986, NMFS published an environmental assessment on the first regulations governing the subsistence taking of northern fur seals. This EA tiered down from the analyses contained in the 1985 EIS and concluded that the action would not have a significant effect on the human environment other than those described in the April 1985 Final EIS on the Interim Convention. Therefore, an EIS was not prepared for the subsistence harvest regulations.

The alternatives considered under the 1986 EA were to regulate the subsistence harvest through Federal regulations (preferred alternative); or allow unregulated taking of fur seals for subsistence purposes (no action alternative). A Finding of No Significant Impact (FONSI) was published on May 12, 1986.

On June 21, 2001, NMFS made an EA available through Federal Register notice concurrent to publishing the final estimates of fur seal subsistence needs through 2002. The EA examined two alternatives; setting the take ranges at levels other than those first established in 1997; and setting the levels at those agreed upon and that had occurred since 1997.

1.3 Related and Other Applicable Actions taken that Affect the Subsistence Harvest of Fur Seals on the Pribilof Islands.

NMFS entered into co-management agreements with the Tribal Governments of St. Paul Island and St. George Island under section 119 of the MMPA in 2000 and 2001, respectively. These agreements are specific to the conservation and management of northern fur seals and Steller sea lions on the Pribilof Islands, with particular attention to the subsistence take and use of these animals. NMFS has worked with both communities to integrate the agreements into one management plan for the purpose of recovering and maintaining sea lion and fur seal populations to levels which provide for a sustainable subsistence take of these species in the Pribilof Islands region.

Under each of the agreements a co-management committee was formed to review, among other things, the manner in which the subsistence harvest in prosecuted and managed, and regulations governing the subsistence harvest of fur seals (see Appendices A and B). These committees have begun to review the consequences of changing the current regulations governing the harvest in ways that would be considered significant in context (such as removing current regulations and managing the subsistence harvest under section 119 of the MMPA). However, at this time neither the Tribal Governments nor NMFS are in a position to recommend specific changes to the status quo management of northern fur seals.

In conjunction with the implementation of the co-management plans, NMFS is working with both Tribal Governments on the Pribilof Islands to revise and update the 1993 Conservation Plan for Northern Fur Seals to reflect the co-management approach to protection, conservation and management of this population. Contracts have been developed with the Tribal Governments to facilitate their role in the development of the Conservation Plan.

1.4 Federal Trust Responsibilities

The concept of "trust responsibility" is derived from the relationship between the Federal government and Indians, first delineated by Supreme Court Justice John Marshall in 1831. The scope of the Federal trust relationship is broad and incumbent upon all Federal agencies. The U.S. Government has an obligation to protect tribal land, assets, and resources as well as a duty to carry out the mandates of Federal law with respect to American Indian and Alaska Native tribes. The unique relationship provides the Constitutional basis for legislation, treaties, and Executive Orders that grant unique rights or privileges to Native Americans.

Executive Order (E.O.) 13084 issued May 14, 1998, requires each Federal agency to establish meaningful consultation and collaboration with Indian tribal governments (including Alaska Natives) in formulating policies that significantly or uniquely affect their communities. Entitled "Consulation and Coordination with Indian Tribal Governments," the order requires agency policy making to be guided by principles of respect for tribal treaty rights and responsibilities that arise from the unique legal relationship between the Federal Government and the Indian tribal governments. Furthermore on issues relating to treaty rights, E.O. 13084 directs each agency to explore, and, where appropriate, use consensual mechanisms for developing regulations.

On November 6, 2000, E.O. 13175 replaced E.O. 13084. The order carries the same title and strengths as the previous order about the government-to-government relationship between the U.S. Government and Indian tribes. E.O. 13175 requires that all Executive departments and agencies consult with Indian tribes and respect tribal sovereignty as they develop policy on issues that impact Indian communities.

Consultation with Priblof Native communities occurs formally and informally multiple times per year. Co-management agreements were signed with St. Paul in 2000 and with St. George in 2001 (see Appendices A and B).

1.5 Action Area

The action area is described as the southeastern Bering Sea, including the Pribilof Islands of St. Paul and St. George.

Chapter 2 Alternatives Considered

2.1 NEPA Guidance for Alternatives

The CEQ regulations for implementing the procedural provisions of NEPA require consideration of a range of reasonable alternatives, to be evaluated in addition to the proposed action, and the environmental impacts of activities under each of these management alternatives to be evaluated. Four alternatives are presented for analytical purposes. These can be evaluated from information and analysis provided in Chapter 3 (Affected Environment) and Chapter 4 (Environmental Consequences). This information presents the issues and impacts, thus providing the basis for choice among alternatives by the agency and the public.

2.2 Description of Proposed Alternatives

For all alternatives which allow for subsistence harvests (i.e., 1, 3, and 4), the harvest would proceed with mitigation measures as described in Section 3.5.3, Subsistence Harvest. Any subsistence harvest in the alternatives would only be subadult males. Female and adult males are not harvested. The following four alternatives have been identified regarding this action:

Alternative 1: Status Quo- Preferred Alternative- Set the subsistence harvest limit to 2,500 northern fur seals, with up to 2,000 harvested from St. Paul and 500 harvested from St. George. These are the same levels established in 1997 (status quo).

Alternative 2: No Action- NMFS would not set the take ranges as required by Regulations at 50 CFR 216.72(b). This regulation requires NMFS to determine and publish the take ranges for the Pribilof Islands subsistence harvest of northern fur seals every three years.

Alternative 3: PBR- Set the subsistence harvest limit equal to the Potential Biological Removal level (PBR), which is 16,162 northern fur seals, with up to 12,930 harvested from St. Paul and up to 3,232 harvested from St. George.

Alternative 4: 5 year average- Set the harvest limit to the most recent five-year average (1999-2003) of the actual harvest. This would set the subsistence harvest limit to 872 northern fur seals, with up to 705 harvested from St. Paul and 167 harvested from St. George.

2.2.1 Alternative 1: Status Quo- Preferred Alternative

Alternative 1 would set the subsistence harvest limit to 2,500 northern fur seals, with up to 2,000 harvested from St. Paul and 500 harvested from St. George. These are the same levels established in 1997 (status quo). This alternative continues the harvest under an established process to establish harvest take levels, and a set of agreed upon take levels, that have been in place since 1997. It also supports the co-management relationship between NMFS and the local tribal governments regarding the management and conduct of the subsistence harvest of fur seals

on the Pribilof Islands. Based on historic take levels, current scientific data, and collective traditional knowledge regarding subsistence needs of the respective communities, take ranges have been established that are cooperatively determined by NMFS and local tribal governments.

This alternative is consistent with the current regulation at 50 CFR 216.72(b) which requires NMFS to publish among other things, a summary of the preceding 3 years' harvests and a discussion of the number of seals expected to be taken annually over the next 3-year period to meet local subsistence needs. This information is used to set take ranges for the number of seals that can be taken annually on each island and is published in the Federal Register. Following a 30 day public comment period, a final notification of the take ranges for the subsequent 3 year period is published in the Federal Register.

Beginning in 2000, the take ranges have been discussed with each tribal government as part of the co-management relationship and agreement. As the history of estimating the subsistence needs of the Pribilof communities has been one of practical and social difficulties, the process to meet the take range regulation has evolved into the long-term acceptance of the ranges first established in 1997.
These levels provide a degree of flexibility the communities feel comfortable with regarding changes and unanticipated needs within the community. As shown in Table 1, the actual take has been consistently declining to the point that the relationship between the annual actual take and established take ranges continues to diverge.

2.2.2 Alternative 2: No Action

NMFS would not set the take ranges as required by Regulations at 50 CFR 216.72(b). This regulation requires NMFS to publish among other things, a summary of the preceding 3 years harvests and a discussion of the number of seals expected to be taken annually over the next 3-year period to meet local subsistence needs. This information is used to set take ranges for the number of seals that can be taken annually on each island and is published in the Federal Register. Following a 30-day public comment period, a final notification of the take ranges for the subsequent 3 year period is published in the Federal Register.

By not fulfilling this requirement, NMFS would effectively eliminate a legal subsistence hunt. Therefore, there would be neither a harvest plan nor harvest limits. All past collaboration with the Pribilof Native community would be null and the co-management agreement signed by NMFS and the tribal governments would not make the harvest legal. With the existing regulations, NMFS must fulfill its obligation under 50 CFR 216.72(b) in order for there to be a legal hunt.

As a result, if the harvest could not proceed, it can be reasonably predicted that the illegal taking (poaching) of fur seals would occur with a variety of adverse consequences for all parties. Other subsistence resources, such as the Steller sea lion, may be harvested at greater levels and be negatively impacted. An additional predictable consequence would likely be some sort of action,

including litigation by the local tribal governments relative to any significant delay or restriction of the harvest.

2.2.3 Alternative 3: PBR

Set the subsistence harvest limit equal to the PBR, which is 16,162 northern fur seals with up to 12,930 harvested from St. Paul and up to 3,232 harvested from St. George. Under the 1994 amendments to the MMPA, PBR is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a recovery factor: $PBR = N_{MIN} \times 0.5R_{MAX} \times F_R$. The recovery factor ($F_R$) for this stock is 0.5, the value for depleted stocks under the MMPA (Wade and Angliss 1997). Thus, for the Eastern Pacific stock of northern fur seals, PBR = 16,162 animals (751,714 × 0.043 × 0.5) (Angliss and Lodge 2003). At present time, there is not a demand for this level of subsistence harvest and it is likely the harvest would stop before reaching this level.

2.2.4 Alternative 4: 5 year average

Set the harvest limit to the most recent five-year average (1999-2003) of the actual harvest. This would set the subsistence harvest limit to 872 northern fur seals, with up to 705 harvested from St. Paul and 167 harvested from St. George. The following table shows the actual harvests for the last five years.

Year	St. Paul	St. George
1999	1000	193
2000	754	121
2001	597	184
2002	648	203
2003	522	132
Total	3521	833
5 year average	704.2	166.6

Table 2.1 Five-year average of northern fur seal subsistence harvest on the Pribilof Islands.

2.3 Issues

The primary issues are potential effects of the different subsistence harvest levels on the northern fur seal population and on the subsistence tradition. Secondary issues are indirect effects of different harvest levels on Steller sea lions and harbor seals, which are also used for subsistence.

Other issues that were examined that had insignificant effects were threatened and endangered species (cetaceans, seabirds), other species, health and safety, essential fish habitat (EFH) and enforcement.

Alternative evaluation and selection of the preferred alternative was primarily based on if it would slow the recovery of the northern fur seal population (see sections 4.1.1 and 4.2.2.1) and if it would limit subsistence needs and traditions (see section 4.2.3.1).

Chapter 3 Affected Environment

The purpose of this chapter is to describe the environment of the Bering Sea and Aleutian Islands (BSAI) including the Pribilof Islands. The descriptions focus on physical and oceanographic features, major living marine resources—their biology, habitat, and current status of the resource—with special emphasis on the fur seal resource. This chapter provides an overview of the affected environment with references to scientific literature cited throughout the text.

3.1 Priblof Islands

The Pribilof Islands and the surrounding Bering Sea marine environment constitute a unique ecosystem. They are located in the central Bering Sea, approximately 310 mi (500 km) west of the mainland and 185 mi (300 km) north of the Aleutian Chain. The Pribilofs support high concentrations of marine mammals, seabirds, fish, and invertebrates. This biodiversity and biological productivity results from the proximity of the islands to the continental shelf break, particularly Pribilof Canyon, along with the general ecological complexity of the isolated island habitat and its assemblage of nearshore habitats, seacliffs, beaches, sand dunes and coastal wetlands unique in the central Bering Sea.

The Pribilofs are made up of two larger, inhabited islands, St. George and St. Paul; two small rocky islets, Otter Island and Walrus Island; and a small rocky outcropping known as Sea Lion Rock. St. George Island is 35 square miles in area, and is the southernmost island, located approximately 15 mi. (25 km) from the shelf break. St. Paul is 44 square miles in area, and is the northernmost island, situated 47 mi. (76 km) NNW of St. George, and 62 mi. (100 km) from the shelf break. Otter Island is located 9 mi (14 km) south of St. Paul, and Walrus Island about 7 mi (11 km) east of St. Paul. Sea Lion Rock is about a quarter mile offshore of the southern tip of St. Paul.

The Pribilof Islands are of volcanic origin with generally moist tundra soils formed from volcanic ash with rock, gravel, sand, and marine and colluvial sediment deposits. St. Paul has mostly rolling upland plateau with a few extinct volcanic peaks and subterranean lava tubes and caverns. There are widespread rocky and sandy beaches backed by dunes, significant seacliff habitat along the western coastline and the only estuary on the islands, Salt Lagoon. St. George is made up of rocky upland hills and ridges with extensive high, precipitous seacliffs and limited beach habitat. The islands are treeless and vegetated in tall grasses, wet to dry tundra, dwarf shrub communities and scattered small-patch wetlands. Otter Island is heavily vegetated. Walrus Island is primarily a low rocky islet. Sea Lion Rock is a rock outcropping bordering a shoreline reef.

The Pribilofs have a maritime climate with windy, cloudy conditions and frequent precipitation throughout the year. Temperatures range between a low of -30˚ F to a high of 64˚ F but typically average between 19-51˚F on St. Paul and 24-52˚F on St. George. In the summer, there is heavy fog and almost continual cloud-cover. Temperatures typically range in the upper 30's to 40's ˚F. May through October. Winters are dominated by freezing conditions and frequent blizzards.

Drift ice is often present offshore, and in severe winters the pack ice can surround the islands for months (TNC 2002).

3.2 Bering Sea Ecosystem

The Pribilof Islands are situated within two large marine ecosystems: the eastern Bering Sea/Aleutian Islands (BSAI) and the Gulf of Alaska (GOA). Their continental shelf areas make up about 74 percent of the total area (2,900,785 square kilometers [km^2]) of U.S. continental shelves.

The Bering Sea is a semi-enclosed, high-latitude sea. Of its total area of 2.3 million km^2, 44 percent is continental shelf, 13 percent is continental slope, and 43 percent is deep water basin. Its broad continental shelf is one of the most biologically productive areas of the world. A special feature of the Bering Sea is the pack ice that covers most of its eastern and northern continental shelf during winter and spring. The dominant circulation of the water begins with the passage of North Pacific water (the Alaskan Stream) into the Bering Sea through the major passes in the Aleutian Islands (Favorite et al. 1976). There is net water transport eastward along the north side of the Aleutian Islands, and a turn northward at the continental shelf break and at the eastern perimeter of Bristol Bay. Eventually Bering Sea water exits northward through the Bering Strait, or westward and south along the Russian coast, entering the western North Pacific via the Kamchatka Strait. Some resident water joins new North Pacific water entering Near Strait, which sustains a permanent gyre around the deep basin in the central Bering Sea.

3.2.1 Trophic Relationships in the BSAI

3.2.1.1 Environmental Regime Shifts

The BSAI lies on the northern edge of a larger regime north of about 42°N called the subarctic Pacific region. Physical features in this regime are primarily driven by the winter atmospheric circulation, in particular the Aleutian low which nearly covers this entire regime. Year-to-year, decadal, and longer term changes in the shape of the Aleutian low determine the nature of the regime.

Regime shifts imply shifts in a characteristic behavior of a natural phenomenon, such as the major spatial and temporal features in the distributions of sea level pressure, wind, sea surface temperature, ice, or ocean currents. To give the best assessment of recent regime shifts in the BSAI, Minobe (1997 and 1999) studied changes in the Aleutian low over the last century and Hare and Mantua (2000) studied changes in the eastern North Pacific from 1965–1997.

3.2.1.2 Bering Sea and Aleutian Islands Regime Changes

The regime shift of 1976/1977 is now widely recognized, as well as its associated far-reaching consequences for the large marine ecosystems of the North Pacific Ocean. The most recent regime shift (1989) has been studied in depth by Hare and Mantua (2000), who assembled and

examined 100 environmental time series of indices (31 climatic and 69 biological) as evidence of regime shift signals. A few of these examples are presented to illustrate that such signals are evident in the BSAI and GOA data.

Evidence from sea surface temperature anomalies around the Pribilof Islands indicates that the BSAI environmental regime appears to have shifted (Figure 3.1-7[a], from NMFS 2001). The dominance of positive (warm) anomalies from 1977 to 1988 switched rapidly to negative (cold) anomalies in 1989, which were still dominating as late as 1997. Further evidence of a shift is seen in the time series of the southern extent of sea ice along 167°W, but the shift is less pronounced and more of a broad trend to cooler conditions with more ice.

A particularly striking example of biological changes was from a time series of quantitative catches of large medusae from bottom trawl surveys on the EBS shelf from 1979 to 1997 (Brodeur et al. 1999). The dramatic increase was in the 1990s, when the median biomass increased tenfold between the 1982–1989 and 1990–1997 periods. Several large-scale, winter–spring atmospheric and oceanographic variables in the Bering Sea also changed around 1990.

3.3 Biological Resources

3.3.1 Marine Mammals

The Bering Sea and Aleutian Islands (BSAI) support one of the richest assemblages of marine mammals in the world. Twenty-seven species are present from the orders Pinnipedia (seals, sea lion, and walrus) and Cetacea (whales, dolphins, and porpoises)(Lowry and Frost 1985, Springer et al. 1999). Of these, 17 species are cetaceans: whales, dolphins or porpoises; and 10 species are pinnipeds; seals, sea lions and walrus. Polar bears and sea otters (Order Carnivora) are also present.
Most species are resident throughout the year, while others seasonally migrate into or out of the area. Marine mammals occur in diverse habitats, including deep oceanic waters, the continental slope, and the continental shelf (Lowry et al. 1982). Following are brief descriptions of the range, habitat, diet, abundance, and population status of species relevant to this analysis.

3.3.1.1 ESA Listed Marine Mammals

Seven species of large whales that occur in Alaska are listed under the ESA including the following: the north Pacific right whale, fin whale, sei whale, blue whale, sperm whale, bowhead whale and the humpback whale. None of these species are affected by the proposed action either individually or as part of a larger cumulative effect of the action on the environment. They are not considered further in this analysis.

The western population of Steller sea lions is the only pinniped species listed under the ESA and found in Alaska. This species will be further addressed in section 3.2.1.4.

3.3.1.2 Other Cetacea

A large number of small cetaceans are found in the action area including killer whales, Pacific white-sided dolphins, harbor porpoises, Dall's porpoises, and several species of beaked whales. None of these species would be affected by the alternatives considered, either individually or as part of a larger cumulative effect of the action on the environment. They are not considered further in this analysis.

3.3.1.3 Carnivora

No other animals of this order would be impacted by the alternatives, either individually or as part of a larger cumulative effect of the action on the environment. They are not considered further in this analysis.

3.3.1.4 Pinnipedia

Three families of pinnipeds are represented in the action area: Otariidae, the eared seals (Steller sea lion and northern fur seal); Odobenidae, the Pacific walrus; and Phocidae, the true seals (harbor, spotted, bearded, ringed, ribbon). Additional information on these animals is provided.

3.3.1.4.1 Northern Fur Seals

The northern fur seal (*Callorhinus ursinus*) ranges throughout the North Pacific Ocean from southern California north to the Bering Sea and west to the Okhotsk Sea and Honshu Island, Japan. Breeding is restricted to only a few sites: the Commander and Pribilof Islands, Bogoslof Island, and the Channel Islands (NMFS 1993).

Northern fur seals pup, mate, and wean on land in isolated rookeries, but spend the remainder of their lives at sea. On the Pribilof Islands, lactating females usually forage within 160 km of the rookeries, but occasionally as far away as 430 km (Goebel et al. 1991). Pups are weaned in October and November, at about 125 days old, and go to sea soon afterward (Gentry and Kooyman 1986). Most females, pups, and juveniles leave the Bering Sea by late November and migrate south as far as Southern California in the eastern North Pacific and Japan in the western North Pacific. They remain pelagic offshore and along the continental shelf until March, when they begin returning to the rookeries. Adult males are believed to migrate only as far south as the GOA (Kajimura and Fowler 1984).

(i) Abundance Estimate: The population estimate for the Eastern Pacific stock of northern fur seals is calculated as the estimated number of pups at rookeries multiplied by a series of different expansion factors determined from a life table analysis to estimate the number of yearlings, 2 year olds, 3 year olds, and animals at least 4 years old (Lander 1981). The resulting population estimate is equal to the pup count multiplied by 4.5. The expansion factor is based on a sex and age distribution estimated after the harvest of juvenile males was terminated. Currently, CVs are unavailable for the expansion factor. As the great majority of pups are born

on the Pribilof Islands, pup estimates are concentrated on these islands, though additional counts are made on Bogoslof Island. Since 1990, pup counts have occurred biennially on St. Paul and St. George Islands, although less frequently on Sea Lion Rock and Bogoslof Island. In 1992, 1994, 1996, 1998, 2000, and 2002 pup counts on the Pribilof Islands and Bogoslof Island were 228,711 (CV = 0.036), and 211,673 (CV = 0.100), 219,226, 198,899 (CV = 0.088), 196,899 (CV = 0.089), and 175,955 (CV = 0.010), respectively (Antonelis et al. 1994, 1996; York et al. 1997, 1998; Ream et al. 1999). The mean pup count for 1998, 2000, and 2002 is 197,360. Therefore, the most recent estimate for the number of fur seals in the Eastern Pacific stock is approximately 888,120.

(ii) Minimum Population Estimate (Nmin): A CV(N) that incorporates the variance due to the correction factor is not currently available. Consistent with a recommendation of the Alaska Scientific Review Group (SRG) and recommendations contained in Wade and Angliss (1997), a default CV(N) of 0.2 was used in the calculation of the minimum population estimate (N_{MIN}) for this stock (DeMaster 1998). N_{MIN} is calculated using Equation 1 from the PBR Guidelines (Wade and Angliss 1997): $N_{MIN} = N/\exp(0.842\times[\ln(1+[CV(N)]^2)]^{½})$. Using the population estimate (N) of 888,120 and the default CV (0.2), N_{MIN} for the Eastern Pacific stock of northern fur seals is 751,714.

(iii) Current Population Trend: The Alaska population of northern fur seals increased to approximately 1.25 million in 1974 after the killing of females in the pelagic fur seal harvest was terminated in 1968. The population then began to decrease with pup production declining at a rate of 6.5-7.8% per year into the 1980s (York 1987a). By 1983 the total stock estimate was 877,000 (Briggs and Fowler 1984). Annual pup production on St. Paul Island has remained relatively stable between 1981 and 1995, indicating that stock size has not changed much in recent years (York and Fowler 1992). The 1996 estimate of number of pups born on St. Paul Island is not significantly different from the 1990, 1992, or 1994 estimates (York et al. 1997). However, the 2000 estimate of the number of pups born was 10% less than the 1992 count and 6% less than the 1996 count. Although there was a slight increase in the number of pups born on St. George Island in 1996, the number of pups born declined between 1996 and 1998, and the 1998 counts were similar to those obtained in 1990, 1992, and 1994. During 1998-02, pup production declined 5.14% per year (SE = 0.26%) on St. Paul Island and 5.35% per year (SE = 0.19%) on St. George Island. Counts in both 2000 and 2002 were lower than previous years; the estimated pup production is now below the 1921 level on St. Paul Island and below the 1916 level on St. George Island.

(iv) Current and Maximum Net Productivity Rates: The northern fur seal population increased steadily during 1912-24 after the commercial harvest no longer included pregnant females. During this period, the rate of population growth was approximately 8.6% (SE = 1.47) per year (A. York unpubl. data, National Marine Mammal Laboratory, 7600 Sand Point Way NE, Seattle, WA 98115), the maximum recorded for this species. This growth rate is similar and slightly higher than the 8.12% rate of increase (approximate SE = 1.29) estimated by Gerrodette et al. (1985). Though not as high as growth rates estimated for other fur seal species, the 8.6%

ate of increase is considered a reliable estimate of R_{MAX} given the extremely low density of the population in the early 1900s.

(v) Potential Biological Removal level: Under the 1994 amendments to the MMPA, the PBR is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a recovery factor: $PBR = N_{MIN} \times 0.5R_{MAX} \times F_R$. The recovery factor ($F_R$) for this stock is 0.5, the value for depleted stocks under the MMPA (Wade and Angliss 1997). Thus, for the Eastern Pacific stock of northern fur seals, PBR = 16,162 animals (751,714 × 0.043 × 0.5)(Angliss and Lodge 2003).

(vi) Diet of Fur Seals: Studies on northern fur seal diets began with the work of Lucas (1899). The most extensive research was based on the pelagic sampling of more than 18,000 fur seals between 1958 and 1974 (Perez and Bigg 1986). Of the fur seal stomachs collected, 7,373 contained food and an additional 3,326 had trace remains. The diet consists of 67 percent fish (34 percent pollock, 16 percent capelin, 6 percent Pacific herring, 4 percent deep-sea smelt and lantern fish, 2 percent salmon, 2 percent Atka mackerel, and no more than 1 percent eulachon, Pacific cod, rockfish, sablefish, sculpin, Pacific sand lance, flatfish, and other fish) and 33 percent squid (Perez 1990). These data showed marked seasonal and geographic variation in the species consumed. In the eastern Bering Sea, pollock, squid, and capelin accounted for about 70 percent of the energy intake. In contrast, sand lance, capelin, and herring were the most important prey in the GOA.

Based on diet studies conducted since the early pelagic collections (Sinclair et al. 1994, Sinclair et al. 1996, Antonelis et al. 1997), some prey items, such as capelin, have disappeared entirely from fur seal diets in the EBS and squid consumption has been markedly reduced. At the same time, pollock consumption has tripled, while the age category of pollock eaten has decreased. Consumption of pollock, gonatid squid, and bathylagid smelt in the eastern Bering Sea has, however, remained consistently important in all diet studies, despite the wide variety of prey available to fur seals within their diving range.

Stomach contents of 73 northern fur seals collected from the Bering Sea—7 in 1981, 43 in 1982, and 43 in 1985—indicated consumption of nearly 100 percent fish (1981), 88 percent fish and 12 percent squid (1982), and 88 percent fish and 12 percent squid (1985) (Sinclair et al. 1994). Analysis of these data showed that pollock and squid were the most frequently eaten prey in the EBS, and that a positive correlation exists between pollock year-class strength and the frequency of pollock in fur seal diets (Sinclair et al. 1994). The same report concluded that northern fur seals are size-selective midwater feeders during the summer and fall in the eastern Bering Sea. Since 1987, studies of northern fur seal diets have been based on fecal samples (scat). A comparative study of fur seal diets based on the current method of scat analysis versus stomach content analysis from the 1980s collections (Sinclair et al. 1996) demonstrated that pollock represented 79 percent of all prey for all years combined in gastrointestinal tracts, and 78 percent of the total prey in fecal samples. The frequency of pollock occurrence in all years averaged 82 percent in gastrointestinal tracts and 76 percent in fecal samples (Sinclair et al. 1996).

Based on the pelagic collections from the 1970s, annual food consumption by the northern fur seal population in the EBS was 432.4×10^3 mt, of which 289.7×10^3 mt represented fish species. Of the total annual fish consumption, commercial groundfish comprised 56 percent, which was an estimated 0.7 percent of the standing biomass of commercial groundfish consumed (i.e., by all predators combined) annually in the eastern Bering Sea (Perez and McAlister 1993). Based on data collected in the 1980s, groundfish consumption has increased as forage fishes have decreased (Sinclair et al. 1994; 1996). Trites (1992) estimated 133,000 mt of walleye pollock (ages 1 to 2) are consumed annually by northern fur seals in the eastern Bering Sea.

(vii) Status: Depleted Determination: On 18 May 1988, NMFS declared the Pribilof Islands (St. Paul and St. George Islands) stock of northern fur seals depleted under the MMPA because it declined to less than 50 percent of levels observed in the late 1950s and, at that time, there was no compelling evidence that carrying capacity (K) had changed substantially since the late 1950s (50 CFR 216.15). The most likely causes of the decline of fur seals were the harvest of adult females from 1956 to 1968, and the lower survival of juveniles and adult females at sea since 1975. Emigration did not contribute to the decline because the species has declined in total numbers throughout its range.

The MMPA defines the term "depletion" or "depleted" (16 U.S.C.1362(1)) as meaning any case in which "(A) the Secretary of Commerce, after consultation with the Marine Mammal Commission (MMC) and the Committee of Scientific Advisors on Marine Mammals established under title II of this Act, determines that a species or population stock is below its optimum sustainable population; (B) a State, to which authority for the conservation and management of a species or population stock is transferred under U.S.C. 1379, determines that such species or stock is below its optimum sustainable population; or (C) a species or population stock is listed as an endangered species or a threatened species under the Endangered Species Act of 1973 (16 U.S.C. 1531, *et seq*.)."

The MMPA defines optimum sustainable population (OSP) as " . . . with respect to any population stock, the number of animals which will result in the maximum productivity of the population or the species, keeping in mind the optimum carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element (16 U.S.C.1362(9))."

NMFS regulations at 50 CFR 216.3 define OSP as " . . . a population size which falls within a range from the population level of a given species or stock which is the largest supportable within the ecosystem (K) to the population level that results in maximum net productivity (MNPL). MNPL is the greatest net annual increment in population numbers or biomass resulting from additions to the population due to reproduction and/or growth losses due to natural mortality."

The MMPA states that marine mammal species, populations and/or stocks should not be permitted to fall below their OSP level (16 U.S.C. 1361(2)). The MNPL is the lower end of OSP. Therefore, to be within OSP, the ratio of current to historic levels should be at or above the maximum rate of pup production (or MNPL). Historically, MNPL has been expressed as a range of values (generally 50-70 percent of K) determined theoretically by estimating what stock size in relation to the original stock size will produce the maximum net increase in population (42 FR

12010, March 1, 1977). MNPL for marine mammals is at least 50 percent of carrying capacity (Eberhardt and Siniff, 1977), and may be as high as 80 percent (Fowler 1981, 1988). In 1977, the mid-range value of 60 percent was used to determine if a stock of dolphins was depleted (42 FR 64548, Dec. 27, 1977). The 60 percent value was supported by NMFS in the final rule governing the taking of marine mammals incidental to commercial fishing operations (45 FR 72178, Oct. 31, 1980). The lower bound of OSP for northern fur seals is also considered to be at 60 percent of K (Fowler, 1981).

(viii) Conservation Plan: Amendments to the MMPA passed into law on 23 November 1988 (P.L. 100-711) direct the Secretary of Commerce to develop a conservation plan on northern fur seals. Under the MMPA, a conservation plan delineates actions for "conserving and restoring the [depleted] species or stock to its optimum sustainable population." (16 U.S.C. 1383*b*(b)). Plans are prepared by NMFS, often with the assistance of planning groups or teams, contractors, state agencies, and others. The amendments further specify that a plan serves as a guide that delineates and schedules those actions believed necessary to restore the northern fur seal to pre-depleted levels of abundance. These actions are outlined in the Implementation Schedule of a conservation plan. Approved plans are subject to modification as dictated by new findings, changes in species status and completion of implementation tasks. Goals and objectives will be attained and funds expended contingent upon agency appropriations and priorities.

The Pribilof Islands Northern Fur Seal Conservation Plan was signed by the Assistant Administrator (AA), and published by NMFS in June 1993. This Conservation Plan includes information on the status of fur seals on the Pribilof Islands, causes of declines, threats to the species, critical information gaps, and recommended research and management actions for meeting the objectives of the plan. The goal of the Conservation Plan will be met when the depleted stock (in this case, northern fur seals) has increased to the level where it can be removed as depleted under MMPA designation. NMFS, together with the Tribal Governments of St. Paul and St. George, is currently revising the 1993 Conservation Plan to develop a more up-to-date version.

3.3.1.4.2 Steller Sea Lions in the EBS

The Steller sea lion (*Eumetopius jubatus*) ranges along the North Pacific Ocean rim from northern Japan to California (Loughlin et al. 1984), with centers of abundance and distribution in the GOA and Aleutian Islands, respectively. The northernmost breeding colony in the Bering Sea is on Walrus Island near the Pribilof Islands.

Habitat includes both marine waters and terrestrial rookeries (breeding sites) and haulouts (resting sites). Pupping and breeding occur during June and July in rookeries on relatively remote islands, rocks, and reefs. Females generally return to the rookeries where they were born to mate and give birth (Alaska Sea Grant 1993, Calkins and Pitcher 1982, Loughlin et al. 1984). Although most often found within the continental shelf region, they may be found in pelagic waters as well (Bonnell et al. 1983, Fiscus et al. 1976, Kajimura and Loughlin 1988, Kenyon and Rice 1961, Merrick and Loughlin 1997).

Observations of Steller sea lions at sea suggest that large groups usually consist of females of all ages and subadult males; adult males sometimes occur in those groups but are usually found

individually. On land, all ages and both sexes occur in large aggregations during the nonbreeding season. Breeding season aggregations are segregated by sexual and territorial status. Steller's sea lions are not known to migrate, but they do disperse widely at times of the year other than the breeding season. For example, sea lions marked as pups in the Kuril Islands (Russia) have been sighted near Yokohama, Japan (more than 350 km away) and in China's Yellow Sea (more than 750 km away). Generally, animals up to about four years of age tend to disperse farther than adults. As they approach breeding age, they have a propensity to stay in the general vicinity of the breeding islands, and, as a general rule, return to their island of birth to breed as adults.

The foraging patterns of adult females vary seasonally. Trip duration for females with young pups in summer is approximately 18 to 25 hours. Trip length averages 17 km, and they dive approximately 4.7 hours per day. In winter, females may still have a dependent pup, but a mean trip duration is about 200 hours. During winter, a mean trip length is about 130 km, and dives total about 5.3 hours per day (Merrick and Loughlin 1997). In winter, yearling sea lions in winter exhibit foraging patterns about half the distance of those females made between summer and winter (mean of 30 km), but shorter in duration (mean of 15 hours), and with less effort devoted to diving (mean of 1.9 hours per day). Estimated home ranges are 320 km^2 for adult females in summer, about 47,600 km^2 (with large variation) for adult females, and 9,200 km^2 for yearlings in winter (Merrick and Loughlin 1997).

Compared to other pinnipeds, Steller sea lions tend to make relatively shallow dives, with few dives recorded to depths greater than 250 m. Maximum depths recorded for individual adult females in summer range from 100 to 250 m; maximum depth in winter is greater than 250 m. The maximum depth measured for yearlings in winter was 72 m (Merrick and Loughlin 1997, Swain and Calkins 1997).

Steller sea lions give birth to a single pup each year; twinning is rare. Males establish territories in May in anticipation of the females' arrival (Pitcher and Calkins 1981). Viable births begin in late May and continue through early July; the sex ratio at birth is slightly in favor of males. Females breed again about two weeks after giving birth. Copulation may occur in the water, but mostly occurs on land (Pitcher and Calkins 1998, Gentry 1970, Gisiner 1985). The mother nurses the pup during the day. She stays with her pup for the first week, then goes to sea on nightly feeding trips. Pups generally are weaned before the next breeding season, but it is not unusual for a female to nurse her offspring for a year or more. Females reach sexual maturity between three and eight years of age and may breed into their early twenties. Females can have a pup every year but may skip years as they get older, or when nutritionally stressed. Males also reach sexual maturity at about the same ages but do not have the physical size or skill to obtain and keep a breeding territory until they are nine years of age or older. Males may return to the same territory for up to seven years, but most return for no more than three years (Gisiner 1985). During the breeding season, males may not eat for 1 to 2 months. The rigors of fighting to obtain and hold a territory and the physiological stress of the mating season reduces their life expectancy. Males rarely live beyond their mid-teens, while females may live as long as 30 years.

In the Bering Sea, the Steller sea lion diet consists of a variety of schooling fishes (e.g., pollock, Atka mackerel, Pacific cod, flatfish, sculpin, capelin, Pacific sand lance, rockfish, Pacific herring, and salmon), as well as cephalopods, such as octopus and squid (Calkins and Goodwin

1988, Lowry et al. 1982, Merrick and Calkins 1995, Perez 1990). Recent analyses of fecal samples collected on Steller sea lion haulouts and rookeries suggest that Atka mackerel is particularly important for Steller sea lions in the central and western Aleutian Islands—over 70 percent of the animals' summer diet in this area is Atka mackerel. Pollock represent more than 60 percent of the diet in the central GOA, 29 percent in the western GOA and eastern Aleutian Islands, and more than 35 percent in parts of the central Aleutian Islands (Merrick and Calkins 1995). Small pollock (less than 20 cm) appear to be more commonly eaten by juvenile sea lions than older animals (Merrick and Calkins 1995).

The total estimated annual food consumption by the Steller sea lion population in the eastern Bering Sea is 185.2×10^3 mt, of which 140.7×10^3 mt (76 percent) is fish. Of the total annual fish consumption, commercial groundfish comprise 69 percent, or 0.4 percent of the standing biomass consumed annually by all predators combined in the eastern Bering Sea (Perez and McAlister 1993).

Daily consumption of herring by captive sea lions was estimated to be between 5.61 and 8.07 kg (Rosen and Trites 1998). In an attempt to predict the nutritional importance of pollock versus herring in the diet of the Steller sea lion, Fadley et al. (1994) reported daily consumption of these two prey items by captive California sea lions (*Zalophus californianus*): each animal consumed 5.2–8.2 kg of herring and 7.8–12.0 kg of pollock daily.

(i) Status: The count of adult and juvenile Steller sea lions in Alaska during 1996 to 1998 was 40,565 (Alaskan western stock = 29,658), with a total for the state of 52,602 including pups (Sease and Loughlin 1999). In the late 1950s and early 1960s, the total North Pacific population was estimated to be about 240,000 to 300,000 (Kenyon and Rice 1961). Steller sea lions are currently managed as two distinct stocks, eastern and western (Loughlin 1997). Abundance of the U.S. eastern stock remained relatively stable from the 1960s to 1985 at around 13,000 to 15,000 (not counting pups) and has since increased to nearly 19,000 (excluding pups). The U.S. western stock, on the other hand, has continuously declined since the 1960s, from around 177,000 (excluding pups) in the 1960s to 33,600 (excluding pups) in 1994. In the 1960s, the western stock included 92 percent of the U.S. population, but by 1994 this proportion had declined to 64 percent (Loughlin et al. 1992, Merrick et al. 1987).

In 1990, the Steller sea lion was listed as threatened under the Endangered Species Act (ESA) throughout its range (55 FR 12645, 55 FR 13488, 55 FR 49204, 55 FR 50005). A recovery plan was completed in 1992. In 1997, the National Marine Fisheries Service (NMFS) reclassified Steller sea lions as two distinct population segments under the ESA (62 FR 24345). The population segment west of 144°W, or approximately at Cape Suckling, was reclassified as endangered. The eastern stock remains listed as threatened.

3.3.1.4.3 Other Pinnipeds in the EBS and BSAI

(i) Pacific Walrus: The Pacific walrus (*Odobenus rosmarus*) occurs primarily in the shelf waters of the Bering and Chukchi Seas (Allen 1980, Smirnov 1929). Most of the population congregates during the summer in the southern edge of the Chukchi Sea pack ice between Long Strait, Wrangell Island, and Point Barrow (Fay et al. 1984). The remainder of the

population, primarily adult males, stays in the Bering Sea during summer (Brooks 1954, Burns 1965, Fay 1955, Fay 1982, Fay et al. 1984).

The species is not listed under the ESA and has no special status under the MMPA. Round Island, one of the most important terrestrial haulouts in the United States, is a state preserve and federal regulations prohibit entry of fishing vessels inside 12 miles (672.22(a)(4)).

(ii) Harbor Seals: Harbor seals (*Phoca vitulina*) inhabit coastal and estuarine waters off Baja California, north along the western coasts of the United States, British Columbia, and southeast Alaska, west through the GOA and Aleutian Islands, and in the Bering Sea north to Cape Newenham and the Pribilof Islands. They haul out on rocks, reefs, beaches, and drifting glacial ice, and feed in marine, estuarine, and, occasionally, fresh waters. Major food items vary by availability and include sand lance, smelt, sculpins, herring, capelin, shrimp, mysids, octopus, pollock, and flatfishes (Lowry et al. 1982).

Three separate harbor seal stocks are recognized in Alaska waters: (1) the southeast Alaska stock, occurring from the Alaska/British Columbia border to Cape Suckling; (2) the GOA stock, occurring from Cape Suckling to Unimak Pass, including animals throughout the Aleutian Islands; and (3) the Bering Sea stock, including all waters north of Unimak Pass (Hill and DeMaster 1999). Population sizes and mortality rates in fisheries are calculated separately.

The Bering Sea stock was surveyed during the autumn molt of 1995 throughout northern Bristol Bay and along the north side of the Alaska Peninsula (Withrow and Loughlin 1996). The estimated abundance, corrected for animals in the water, is 13,312 (Hill and DeMaster 1999). NMFS observers monitored incidental take in the BSAI groundfish trawl, longline, and pot fisheries. The mean annual (total) mortality was 2.2 for the BSAI groundfish trawl fishery, 0.6 for the BSAI longline fishery, and 1.2 for the BSAI pot fishery, a total of 4 harbor seals (Hill and DeMaster 1999).

(iii) Spotted Seals: Spotted seals (*Phoca largha*) are distributed along the continental shelf of the Beaufort, Chukchi, Bering, and Okhotsk Seas south to the northern Yellow Sea and western Sea of Japan (Shaughnessy and Fay 1977). They are known to occur around the Pribilof Islands, Bristol Bay, and the eastern Aleutian Islands. Of eight known breeding areas, three occur in the Bering Sea. Only the Alaska stock is recognized in U.S. waters.

Preferred habitat for spotted seals is the "front zone" of pack ice, generally rectangular floes 10–20 m in diameter with brash ice or open water in between (Burns 1970, Burns 1981a). When pack ice is absent, the habitat requirements of spotted seals are similar to those of harbor seals.

A reliable estimate of spotted seal population abundance is currently not available (Rugh et al. 1995). Early estimates of the world population were in the range of 334,000 to 450,000 animals (Burns 1973). The population of the Bering Sea, including Russian waters, was estimated to be 200,000 to 250,000, based on the distribution of family groups on ice during the mating season (Burns 1973). However, comprehensive systematic surveys were not conducted to obtain these estimates. Ice-associated seals, such as the spotted seal, are particularly sensitive to changes in weather and sea-surface temperatures, which strongly affect their ice habitat. Data are

insufficient to make reliable predictions of the effects of arctic climate change on the Alaska spotted seal stock.

(iv) Bearded Seals: Bearded seals (*Erignathus barbatus*) are circumpolar in their distribution, extending from the Arctic Ocean south to Hokkaido in the western Pacific. In Alaskan waters, bearded seals occur on the continental shelves of the Bering, Chukchi, and Beaufort Seas (Burns 1981a, Johnson et al. 1966, Ognev 1935).

Only Alaska bearded seal stock is recognized in U.S. waters. Early estimates of the Bering-Chukchi Sea population range from 250,000 to 300,000 (Burns 1981a, Burns 1981b, Burns et al. 1981, Popov 1976). Until additional surveys are conducted, reliable estimates of abundance are considered unavailable. Reliable data on trends in population abundance are likewise unavailable.

(v) Ringed seals: Ringed seals (*Phoca hispida*) have a circumpolar distribution in all Arctic Ocean waters (King 1983). In the eastern North Pacific Ocean, they are found in the southern Bering Sea and range as far south as the seas of Okhotsk and Japan. They have an affinity for ice-covered waters and are well adapted to occupying seasonal and permanent ice. They remain in contact with ice most of the year and pup on the ice in late winter and early spring (McLaren 1985).

Only the Alaska stock is recognized in U.S. waters. A reliable abundance estimate for the Alaska stock of ringed seals is currently not available (Hill and DeMaster 1999). Crude estimates of the world population have ranged from 2.3 to 7 million, with 1 to 1.5 million in Alaskan waters (Kelly 1988). The most recent abundance estimates are based on aerial surveys conducted in 1985, 1986, and 1987 by Frost et al. (1988), but these surveys covered only a limited portion of the stock's geographic range. Reliable data on population abundance trends for the Alaska stock are also unavailable. The concern previously expressed regarding regional weather patterns for spotted and bearded seals applies to ringed seals as well.

(vi) Ribbon Seals: Ribbon seals (*Phoca fasciata*) inhabit the North Pacific Ocean and adjacent fringes of the Arctic Ocean. In Alaskan waters, ribbon seals are found in the open sea, on the pack ice, and on shorefast ice (Kelly 1988). They range northward from Bristol Bay in the Bering Sea into the Chukchi and western Beaufort Seas (Braham et al. 1984, Burns 1970, Burns 1981b).

Only the Alaska stock is recognized in U.S. waters. A reliable abundance estimate for the Alaska stock of ribbon seals is currently not available (Hill and DeMaster 1999). Burns (1981b) estimated the worldwide population of ribbon seals at 240,000 in the mid-1970s, with an estimate for the Bering Sea at 90,000 to 100,000. Reliable data on trends in population abundance for the Alaska stock of ribbon seals are unavailable. The concern previously expressed regarding regional weather patterns for spotted, beared, and ringed seals applies to ribbon seals as well.

3.4 Seabirds

Seabirds spend the majority of their life at sea rather than on land. The group includes albatrosses, shearwaters, petrels (*Procellariiformes*), cormorants (*Pelecaniformes*), and two families of *Charadriiformes*, gulls (*Laridae*), and auks (*Alcidae*), such as puffins, murres, auklets, and murrelets. Several species of sea ducks (*Merganini*) also spend much of their lives in marine waters. Other bird groups contain pelagic members, such as swimming shorebirds (*Phalaropodidae*), but they seldom interact with groundfish fisheries, and therefore will not be further discussed.

Thirty-eight species of seabirds breed in Alaska. More than 1,600 colonies have been documented, ranging in size from a few pairs to 3.5 million birds. The U.S. Fish and Wildlife Service (USFWS) is the lead federal agency for managing and conserving seabirds and is responsible for monitoring the distribution and abundance of populations. Breeding populations are estimated to contain 36 million individual birds in the Bering Sea and 12 million in GOA; total population size (including subadults and nonbreeders) is estimated to be approximately 30 percent higher. Five additional species that occur in Alaskan waters during the summer months contribute another 30 million birds.

Population trends are monitored at 3 to 14 colonies per species. The sizes of breeding populations of seabirds in the GOA, eastern BSAI are not static. There have been considerable changes in the numbers of seabirds breeding in Alaskan colonies since the original counts made in the mid-1970s. Trends are reasonably well known for species that nest on cliffs or flat ground such as fulmars, cormorants, glaucous-winged gulls, kittiwakes, and murres, and for storm-petrels and tufted puffins. Trends are known for one or two small areas of the state for pigeon guillemots, two areas for murrelets, and two areas for auklets. Not known are trends for other species (jaegers, terns, most auklets, and horned puffins, Byrd and Dragoo 1997, Byrd et al. 1998, 1999). Population trends differ among species. Trends in many species vary independently among areas of the state, due to differences in food webs and environmental factors.

None of these species will be directly or indirectly affected by the alternatives considered in this proposed action.

3.4.1 ESA Listed Seabirds

Three species of marine birds found in the BSAI are listed under the ESA: the short-tailed albatross (Endangered); spectacled and Steller's eider (Threatened). None of these species will be directly or indirectly affected by the alternatives considered in this proposed action.

3.5 Commercial Fisheries Within the BSAI

3.5.1 Fisheries in the BSAI Prior to 1970

The groundfish fisheries in the BSAI and GOA were developed by Russian and Japanese fishermen between 1959 and 1976 (except for halibut). Prior to 1976, there was virtually no domestic involvement in these fisheries.

The Soviets began commercial fishing operations off Alaska in 1959, however, no catch statistics were provided until 1964 when the U.S.S.R. began to provide these data to the Food and Agricultural Organization (FAO) of the United Nations. Obtaining accurate fishing mortality data was a general problem of the foreign distant water fisheries off Alaska. Pruter (1976) estimated that the cumulative catch of bottomfish by all nations during the period 1954-1974 amounted to more than 22 million mt, of which Japan accounted for more than 15 million mt (67 percent), the USSR accounted for about 6 million mt (25 percent) and the U.S. for about 1.5 million mt (6 percent). The remainder of the catch was taken by other nations like South Korea, Poland, East Germany, West Germany, China (Taiwan), and Canada.

The U.S. lifted restrictions on Japanese fleets in U.S. waters in 1952. In 1954, Japanese fishing fleets returned to the BSAI with 2 to 4 mothership fleets and up to three independent trawlers. Until 1957, these vessels fished for yellowfin sole and other flounder off Bristol Bay (Bakkala et al. 1981). From 1958 to 1963, the Japanese fleets expanded throughout the Bering Sea and included sablefish, Pacific ocean perch, and herring in the fishery, although yellowfin sole was still their principal focus (Bakkala et al. 1981). These catch statistics reveal the growth and magnitude of the foreign groundfish harvest off Alaska during the late-1950s through the early-1970s. Of particular note were the high catches of the yellowfin sole fishery in the Bering Sea, which peaked in 1962, and the high catches of slope rockfish (e.g., Pacific ocean perch) in the GOA during the period 1963-1968. Both of these stocks were overfished, and while yellowfin sole is believed to have recovered, slope rockfish are still recovering.

From 1960 to 1962, this fishery landed between 421,000 and 554,000 mt annually. The total catch in the eastern Bering Sea rose sharply in the mid-to-late-1960s when large, factory trawlers replaced smaller trawlers. From 1964 to the mid-1970s, the fishing power of these fleets created a pattern of overfishing one species before shifting to another species. This pattern was reflected in a progression of increasing catch, followed by steep declines as abundance fell off, followed by another increase in catch as the fleet targeted another species or new fishing grounds. With the decline of catches in the Bering Sea, the fleet moved to new areas, including the GOA.

In the early 1960s, the U.S. had fisheries authority only to 3 miles and those waters were closed to all foreign fishing beginning in 1964. The U.S. thus had little leverage to restrict the large offshore Japanese and Soviet operations during their initial build-up. Fisheries research and information exchanges were conducted initially with Japan and Canada under the International North Pacific Fisheries Commission (INPFC), but it focused mainly on salmon interception issues beginning with its first organizational meeting in 1954. The Japanese provided some catch data, but the Soviets, fishing on five-year plans, provided very little information on their harvests.

The U.S. fisheries extended their jurisdiction from 3 to 12 miles on October 4, 1966 (P.L. 89-658). It provided for continued foreign fishing in the 9-mile contiguous zone, but significantly increased U.S. leverage in controlling those fisheries. For example, INPFC first considered joint studies of groundfish (other than halibut) such as Pacific ocean perch and sablefish in 1967-1971. It produced no joint conservation recommendations for either species even though it was well recognized that both stocks were in jeopardy. The INPFC and the U.S.- Canada International Pacific Halibut Commission began a joint monitoring program for halibut bycatch in Japanese trawlers in the eastern Bering Sea in 1972.

U.S.-foreign bilateral agreements were the main mechanisms for managing the foreign fisheries. Bilateral agreements were negotiated in protracted sessions, beginning in 1967 with Japan and the USSR (there was a king crab bilateral with the Soviets in 1965). The first one was negotiated for groundfish with the Soviets in February 1967. The early bilateral agreements focused on protecting domestic crab, halibut and shrimp fisheries from gear conflicts and grounds preemption by foreign trawlers, and protecting fur seal populations in the Pribilof Islands.

3.5.2 Commercial Fisheries From the 1970s to the Present

In the early 1970s, foreign access to U.S. fishing grounds within the 12-nautical mile limit was controlled through bilateral agreements with Japan, Poland, the USSR, Taiwan, and the Republic of Korea (ROK). These agreements established time-area restrictions, limits on the amounts of commercial species that could be harvested, and regulations restricting foreign fleets from targeting certain species. The first closures were imposed to reduce the foreign catch of adult and juvenile Pacific halibut. In 1973, when major groundfish stocks began to seriously decline, catch quotas were negotiated between the U.S. and the principal foreign fishing nations.

Despite these restrictions, foreign catch levels remained high. By 1976, foreign fleets had overfished several groundfish stocks including yellowfin sole (Pruter 1976) and Pacific ocean perch, and had dramatically reduced the catch per unit of effort for sablefish and walleye pollock. For example, between 1968 and 1973, fishing effort for walleye pollock had increased almost four times while annual catch-per-unit-effort had declined by 50% and the fishery was increasingly dependent on small, young fish. These high catch levels contributed to the decline of other, commercially-important species like Pacific halibut.

Groundfish management was addressed beginning in 1972-1973. By then, foreign operations had depressed stocks off Alaska. Catches of yellowfin sole in the eastern Bering Sea, for example, had fallen sharply following very large removals by Japan and the Soviet Union. Pacific ocean perch stocks were decimated. Pollock catches were increasing rapidly, and were thought likely to follow the same pattern as perch and flatfish.

In 1973-1974, catch quotas were placed on EBS pollock and flatfish. Additionally, a complex array of closures was established mainly to protect U.S. fisheries for crab and halibut. The catch quotas represented the average catches of the previous 3-4 years and were an attempt to put the fisheries on hold so the stocks could be evaluated. Unfortunately, each country was responsible for monitoring its catch quotas, the only internationally acceptable arrangement at the time. The final round of negotiations on bilateral agreements before the Act was passed occurred in late 1974 with Japan and in mid-1975 with the USSR. The U.S. had negotiated an agreement with ROK in 1972, effective through 1977, and with Poland in 1975.

3.5.3 Alaska State Managed Fisheries

The Alaska Department of Fish and Game (ADFG) oversees BSAI crab, salmon, and some rockfish fisheries in Federal waters (EEZ) under FMPs adopted by the North Pacific Fishery Management Council (NPFMC). ADFG coordinates their fishery openings and in-season adjustments with Federal fisheries. For example, when groundfish fishing is open in Federal waters, current state regulations allow fishing to occur in state waters in what is referred to as the

"parallel" fishery. However, the State retains regulatory jurisdiction over fisheries within State waters.

State fisheries are managed by a system of regional offices throughout the state. Generally, each region has separate state FMPs and is responsible for producing management reports, issuing harvest limits, and providing in-season management of fisheries. This is in contrast to the Federal fishery which is composed of very large management units with relatively large harvest limits. The state's system allows for micro-management down to the bay or stream level. Closures are often issued over VHF radio, and fishery openings can be as short as 20 minutes. Whereas the Federal fishery uses summer and winter surveys combined with stock assessment models to assess biomass and catch limits, the state employs a variety of methods of determining catch and biomass including stock recruitment models, aerial surveys, escapement goals, historical fishery harvest performance, and others.

3.6 Traditional Knowledge of the Bering Sea

Coastal Alaska Natives have a long history of living closely with the marine resources of the Bering Sea and GOA. This knowledge has been passed from generation to generation within Alaska Native communities, but has traditionally not been integrated with Western science. As an attempt to bridge this gap, The Bering Sea Coalition and the Whirling Rainbow Center held the first International Indigenous People's Summit Conference on the Bering Sea, March 16–20, 1999, entitled "Wisdom Keeper's of the North: Vision, Healing, and Stewardship for the Bering Sea" (Bering Sea Coalition 1999). The following principles were intended to be used as a framework for discussions:

- Be rooted in process-oriented Alaska Native traditional gathering models rather than the goal-oriented Western convention model.
- Provide coastal communities with a widely representative forum to review current research on the Bering Sea ecosystem and its components.
- Consider models of Native environmental management and community development to strengthen their collective stewardship role.
- Create an opportunity for the traditional knowledge and wisdom of Bering Sea Native peoples to be heard beyond the confines of the villages.
- Promote the utilization of traditional knowledge and wisdom of indigenous peoples in scientific, resource management, and responsible use policies affecting the Bering Sea.

At this meeting, many observations were made by Alaska Natives and others on the state of the Bering Sea ecosystem. The following observations were made during the conference. The comments presented are those most closely related to environmental changes that attendees to the conference have observed:

- ". . . the cyclical nature of things."
- "The ice on the Bering Sea used to be three to four feet thick, and now it is only six to eight inches thick."
- "The weather is changing and is much warmer than in the past."
- "The number of fish has decreased."
- "In one area, beaver are moving much farther up the streams and constructing dams, blocking off the movement of fish."
- "There has been an increase in the presence of worms and king salmon."
- "Dumping of bycatch into the sea is a shocking abuse of cultural mores. We never waste anything. We take for food and we always share. When you hunt, only get what you need to eat."
- "Herbs and wild celery are brown from pollution in the atmosphere."
- "Salmon have spots on them, and their flesh is different."
- "Our fish are coming, but are not as good-looking as they used to be. Our seals are thinner and the fish have gashes on them from the trawl nets."
- "The bird eggs are fragile now. You touch them and they break. Something is happening to them that is not good, and we need help to find out what it is."
- "Sheefish is a beautiful fish and is being ruined now, too. Why are they less today?"
- "Cold weather has something to do with the survival of some sea mammals. Now the tides are changing because the climate is warming up, and that has something to do with animal declines because the ice is thinning. The animals need thick ice."
- "Sports fishermen and trawlers throw fish away that they catch. This wanton use of our animals and fish is part of the reason for their decline."
- "I eat the sea lion, but we can't eat its liver because it has mercury."
- "We are taking too much from Mother Earth and the animals without giving anything back. The greed is ruining us."
- "Changes have occurred in the whale population, migration, and appearance."

Another source of traditional knowledge is historical records of changes seen in the Bering Sea and GOA. The following notes were taken from *Notes from the Unalashka District* by Russian Orthodox priest Ivan Veniaminov (notes provided by Merrill 1999):

- Significant decreases in cod, salmon, and other marine fish abundance beginning in mid 1820s lasting through mid 1830s.
- Significant decreases in sea otter, sea lion, and seal populations during the mid 1820s.
- In the early 1800s over one thousand sea otters were taken in this district. Now (mid to late 1830s) only 70 to 150 otters are taken and there was a time (1826) that the catch was only 15 otters.
- On Unga Island, anywhere from 30 to 200 head of caribou were taken at one time; now only five caribou are usually taken.
- In the spring, they used to catch several hundred cod daily from baidaras (kayaks), but in the years 1825 and 1826 there was not a single cod fish taken. Also, seasonal migrating fish (e.g., salmon and Dolly Varden) used to be taken in the hundreds of thousands. Now they scarcely catch twenty thousand fish.
- Sea otters are now found only on the South side, close to shore, and in very small numbers.
- Sea lions are found in even smaller numbers, in a single locality, not far from Usov Bay, and not a single fur seal is to be found anywhere.

Additional, more recent comments listed by Merrill (1999) include the following:

- Cod stocks decreased in the mid 1910s and many cod fishing stations closed.
- Sudden decreases in marine fish and mammal species occurred in the late 1940s and mid 1950s. These observations seem to reflect more recent scientific findings linking fish abundance to climatological conditions.

Additional local knowledge is provided by fishermen and others directly in contact with the fisheries and marine ecosystems in which they work. They tend to notice changes in fisheries and the environment on a qualitative level as they are impacted by those changes. Their insights are provided below. The following information was provided by Vining (1995).

- The GOA underwent a dramatic change in the 1970s, according to coastal residents. Species composition switched from shellfish to finfish, marine temperatures warmed, and larval and juvenile fish began "contaminating" the tows of Kodiak area shrimp fishermen. The shrimp fishermen discovered another problem when they found a "green slime" plugging their nets, requiring cleaning

every second tow. Also, Steller sea lions began tearing up trawl nets. These two problems lasted only a few years.

- There has been a decline of forage fish, simultaneous to the decline of the shrimp population. By the 1980s, the shrimp and king crab populations were below threshold levels and the fisheries were closed. Capelin, which was traditionally observed spawning on beaches in the Kodiak area, has rarely been observed on beaches since then.

- Starting in October 1993, the Kodiak trawl fleet had great difficulty locating fishable concentrations of rock sole. The lack of rock sole persisted through at least the first three quarters of 1994. Dover sole also proved difficult to find in fishable concentrations. New groups of 30 cm halibut were reported on the grounds and halibut bycatch rates in 1994 were much greater than those in 1993.

The following information was provided by Vining (1998).

- Sea surface temperatures in the Bering Sea were well above normal in the summer of 1997.

- A massive bloom of coccolithophores occurred in the EBS July through August 1997, which may have altered the trophic dynamics of the Bering Sea food web. For instance, the returns of pink salmon in Alaska were much lower than expected for all regions of the state following this bloom. The sockeye salmon returns were lower than forecast and cnidarian (jellyfish) species were highly abundant.

- There were several observations of rare and exotic species in 1997. These include a right whale and her calf in the Bering Sea, an ocean sunfish, a pelagic armourhead, and a jack were observed off Kodiak Island. Greenland turbot and a large shark (possibly a great white) were taken in set nets in the Shumagin Islands. Right whales have been observed each year since 1996.

- Two stone spearheads were recovered from a bowhead whale taken for subsistence purposes off Barrow by Ben Ahmaogak's crew. Because steel replaced stone at the turn of the century, the harpoon blades were estimated to be at least 100 and, perhaps, 130 years old, and indicate that the whales may live longer than previously thought (Weintraub 1996).

The following information was provided by Vining (1998).

- In 1998, there were several warm-water species observed in the Gulf of Alaska along with other stray fish, marine mammals, and seabirds. Several Pacific barracuda (*Sphyraena argentea*) were sighted in July; two were caught in the Valdez Arm of Prince William Sound, one from Old Harbor on Kodiak Island, and several were caught near Haines. Ocean sunfish (*Mola mola*) were seen in Resurrection Bay in mid-August and near Ketchikan from July through September. Chub mackerel (*Scomber japonicus*) were also found near Ketchikan

and, although these two species are not uncommon in southeast Alaska, the quantities documented for both were unusual. Similarly, Pacific sleeper sharks were caught (and released) in higher than normal levels in Cook Inlet, while salmon sharks were caught in fairly large numbers off Afognak Island (Kevin Brennan, ADF&G - personal communication).

- The incidence of spiny dogfish has dramatically increased in the Kodiak area and in Prince William Sound (Bill Bechtol and Dave Jackson, ADF&G - personal communication). In 1998, this species' occurrence in collection tows increased by more than 40 percent. This increase has also been observed in the International Pacific Halibut Commission's Gulf of Alaska halibut longline surveys (Lee Hulbert, NMFS - personal communication), from NMFS 2001.

- Several individual species were seen at some unusual times and/or places including a Pacific white-sided dolphin in a cove near Haines on a regular basis, and a Northern right whale just off Kodiak Island.

- As for birds in the Gulf of Alaska, a gray-tailed tattler *(Heteroscelus brevipes)* was spotted just south of the Kenai Peninsula, which is unusual in this area. Also, a mallard (*Anas platyrhynchos)* was spotted several miles offshore when it landed near a halibut research vessel. Mallards are common to this area, but not so far offshore. Lastly, common murre *(Uria aalge)* die-offs were reported in Cook Inlet, Kodiak, east Aleutians, Seward, and the Bering Sea.

- Three northern elephant seals were spotted near and around Unalaska during late June and early July, whereas they are usually found farther offshore and at a different time of year. There was a poor return of sockeye salmon as well as chinook salmon to Bristol Bay.

- Both the Bering Sea and the Gulf of Alaska had warmer-than-usual temperatures (Hare and Mantua 2000), though not as great as was observed in 1997.

3.7 Social, Economic and Cultural Environment

3.7.1 Community Profiles in the BSAI and Pribilof Islands

The population structure of the communities and regions in the BSAI vary considerably. Within the relevant coastal Alaskan communities there is a relationship between the percentage of Alaska Native population and commercial fisheries development. Specifically, communities that have developed as large commercial fishing communities in the BSAI region have become less Native in composition over time compared to other communities in the region. There are many variables involved, but for most communities noted the relationship is quite straightforward. The fishery has also had an impact on the male-female population balance for some of the Alaskan communities that are the focus of intensive groundfish fishing or crab processing. This is due to the fact that processing workers reside within these communities for varying durations, and that this workforce is predominately male. An exception to this generalization is St. Paul, where intense processing activity takes place, but where much of the processing associated employment

is found aboard mobile processors, such that the employees typically are not included in population counts. The differences in the male/female and Native/non-Native population segments are, to a degree, indicative of the type of articulation of the directly fishery-related population with the rest of the community.

3.7.1.1 Pribilof Island Communities

Table 3.2 provides ethnicity information from the 2000 census for each of eight communities in the BSAI and Pribilof Island region. As shown, these communities vary widely in their population structure. For example, Unalaska the second largest community, has the lowest Alaska Native population percentage, while St. Paul and St. George have a much higher Alaska Native population component than any of the other communities shown. Akutan, while having a relatively low Alaska Native population percentage is, however, arguably one of the "most traditional" Aleut communities. Unalaska, Adak, and Kodiak have far higher white or non-minority population percentages than the other five communities. Asian residents represent the largest population segment in Akutan, and the second largest Unalaska and Kodiak (behind whites) as well as in King Cove (behind Alaska Natives), and the third largest in Sand Point (behind Alaska Natives and whites). These communities have quite different histories with respect to the growth of the different population segments present in the community in 2000. Each is summarized briefly below. One important constant across all of these communities is that each is a minority community in the sense that minorities make up a majority of the population in each community.

The Pribilof Islands were encountered in 1786 by Russian fur traders who landed first on St. George, and originally named the larger island to the north St. Peter and St. Paul Island. Beginning in 1788, the Russian American Company relocated indentured or enslaved Aleuts from Siberia, Atka and Unalaska to the Pribilofs to hunt fur seals, and the contemporary population of the communities of St. Paul and St. George trace their ancestry to those original hunters. The island was administered by the Russian American Company until the sale and transfer of Alaska from Russia to the U.S. in 1867. In 1870, the Alaska Commercial Company was awarded a 20-year sealing lease by the U.S. government, and provided housing, food and medical care to the Aleuts in exchange for seal harvesting. In 1890, a second 20-year lease was awarded to the North American Commercial Company. The 1910 Fur Seal Act ended private leasing on the Islands and placed the community and fur seals under the U.S. Bureau of Fisheries. In 1983, Congress passed the Fur Seal Act Amendments, which ended government control of the commercial seal harvest and the effective federal domination of daily life on the island. Commercial sealing was discontinued shortly after. The local commercial halibut fishery got its start in 1981, and a crab processing plant was built several years later. Local residents hold commercial fishing permits for halibut, a few own halibut individual fishing quotas, and local boats also fish for CDQ halibut. There are onshore processing facilities on St. Paul, and crab is processed on mobile processing platforms in both St. Paul and St. George.

Information on income and employment for the Alaska communities most heavily engaged in the BSAI crab fishery are presented in Tables 3.2 and 3.3. These tables are based on 2000 U.S. Census data and they provide useful comparative information. Table 3.3 displays median household and family income. As shown, the range is large for the communities listed. For example, median family income in Unalaska is almost twice a large as the comparable figure for

Akutan. This does not reflect the entire range for the Aleutian/Pribilof Islands region, however, as a couple of communities in the region without commercial crab development (Atka and Nikolski) have a lower median family income than Akutan. In 2000, Unalaska had the highest median family income in the Aleutian/Pribilof Islands region at $80,829 and Atka had the lowest at $34,375.

Table 3.4 displays data on employment and poverty information for the relevant communities for 2000. These data must be interpreted with some caution, as it is apparent that the census that generated these figures must have occurred at a time when seafood processing workers were present but idle in some of the communities. For example, Akutan with a total population of 713, is shown has having 505 unemployed persons with an unemployment rate of 78.9 percent. Given that Akutan consists of a traditional community of about 80 residents and a large seafood processing facility whose workers account for more than 600 community residents, it is obvious that the census took place while seafood processing workers were present but not employed, which is not a typical situation. In contrast, the 1990 census occurred when the processing plant was operating, and only 2 out of 527 residents were unemployed, with an unemployment rate of 0.4 percent.

3.7.1.2 Housing

Group housing in St. Paul has historically been largely associated with federal employment, temporary construction projects, and seafood processing. Federal employment declined significantly prior to 1990. As shown in Table 3.5, 26 percent of the population lived in group housing in 1990, but only 4 percent did so in 2000. This sharp drop is attributable to a reduction in enumeration of fish processing employees (but whether this was due only to a decline in such activity, or at least partially to change in the timing of such activity, is not clear). It is also likely a function of a decline in "special projects" (with outside workers) as well.

Table 3.2 Ethnic composition of population, selected Bering Sea and Aleutian Islands communities, 2000.

	Unalaska		Akutan		King Cove		Sand Point		Adak		St. Paul		St. George		Kodiak	
Race/Ethnicity	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
White	1,893	44.2%	168	23.6%	119	15.0%	264	27.7%	157	49.7%	69	13.0%	12	7.9%	2,939	46.4%
African American	157	3.7%	15	2.2%	13	1.6%	14	1.5%	4	1.3%	0	0.0%	0	0.0%	44	0.7%
Native American/Alaska Native	330	7.7%	112	15.7%	370	46.7%	403	42.3%	111	35.1%	457	85.9%	140	92.1%	663	10.5%
Native Hawaiian/Other Pacific Islander	24	0.6%	2	0.3%	1	0.1%	3	0.3%	6	1.9%	3	0.1%	0	0.0%	59	0.9%
Asian	1,312	30.6%	275	38.6%	212	26.8%	221	23.2%	31	9.9%	0	0.0%	0	0.0%	2,010	31.7%
Some Other Race	399	9.3%	130	18.2%	47	5.9%	21	2.2%	0	0.0%	0	0.0%	0	0.0%	276	4.4%
Two Or More Races	168	3.9%	11	1.5%	30	3.8%	26	2.7%	7	2.2%	3	0.1%	0	0.0%	343	5.4%
Total	4,283	100%	713	100%	792	100%	952	100%	316	100%	532	100%	152	100%	6,334	100%
Hispanic[1]	551	12.9%	148	20.8%	59	7.4%	129	13.6%	16	5.1%	0	0.0%	0	0.0%	541	8.5%

Notes: N - number of individuals.
% - percentage of individuals.
[1]Hispanic is an ethnic category and may include individuals of any race and, therefore, is not included in the total as this would result in double counting.

Source: U.S. Bureau of Census.

Table 3.3 Household income information for selected Bering Sea and Aleutian Islands crab communities, 2000.

Community	Housing Units	Occupied Housing Unites	Vacant Housing Units	Total Households	Average Persons Per HH	Median HH Income	Family Households	Median Family Income
Unalaska	988	834	154	834	2.51	$69,539	476	$80,829
Akutan	38	34	4	34	2.21	$33,750	18	$43,125
King Cove	207	170	37	170	2.90	$45,893	117	$47,188
Sand Point	282	229	53	229	2.67	$55,417	156	$58,000
Adak	884	159	725	159	1.99	$52,727	61	$53,899
St. Paul	214	177	37	177	2.88	$50,750	123	$51,750
St. George	67	51	16	51	2.98	$57,083	42	$60,625
Kodiak	2,255	1,996	259	1,996	3.10	$55,142	1,362	$60,484

Notes: HH - household
Source: U.S. Bureau of Census.

Table 3.4 Employment and poverty information for selected Bering Sea and Aleutian Islands crab communities, 2000

Community	Persons Employed	Persons Unemployed	Percent Unemployment	Percent Adults Not Working	Not Seeking Employment	Percent Poverty
Unalaska	2,675	414	11.1%	27.93%	625	12.5%
Akutan	97	505	78.9%	84.84%	38	45.5%
King Cove	450	31	4.7%	31.50%	176	11.9%
Sand Point	427	190	22.8%	48.67%	215	16.0%
Adak	196	16	6.7%	16.31%	23	4.7%
St. Paul	227	40	9.1%	39.22%	143	11.9%
St. George	76	3	3.1%	21.64%	18	7.9%
Kodiak	3,053	160	3.6%	29.62%	1,170	7.4%

Source: U.S. Bureau of Census.

Table 3.5 Group quarters housing information for St. Paul, 1990 and 2000.

Year	Total Population	Group Quarters Population		Non-Group Quarters Population	
		Number	Percent of Total Population	Number	Percent of Total Population
1990	763	196	25.69%	567	74.31%
2000	532	22	4.13%	510	95.87%

Source: U.S. Census 1990 STF2, Census 2000 Summary File 1.

Table 3.6 provides 1990 census information on group housing and ethnicity for St. Paul. Also as shown, ethnicity varied strikingly between the group and non-group housing, with the non-group housing population being 88 percent Alaska Native and the group housing population being only 2 percent Alaska Native. Table 3.7 provides information on the age and the male/female ratio of St. Paul's population in 1990 and 2000. As shown, there was a larger male to female imbalance in 1990 than is seen in 2000. This, like the changes seen in overall population, ethnic composition of the population, and proportion of the population living in group quarters, can be attributed to the lack of a transitory or mobile labor force in 2000, which has resulted in the community having less of an "industrial" or "institutional" type of population and more of a "residential" type of community population.

St. George has yet a different population structure. As shown in Table 3.8, none of the residents of St. George lived in group quarters in 1990 or 2000. This is consistent with no commercial seafood processing taking place on shore in the community during this period

Table 3.9 provides a breakout by ethnicity for St. George's population by housing type for 1990. As shown in Table 3.10, the male to female ratio is much closer to an even distribution reflective of a typical residential population than is seen in any of the other communities profiled. Alone among the communities discussed, females outnumber males in St. George. Unlike the other communities profiled, St. George has seen virtually no commercial fisheries development onshore.

Table 3.6 Ethnicity and group quarters housing information for St. Paul, 1990.

Race/Ethnicity	Total Population		Group Quarters Population		Non-Group Quarters Population	
	Number	Percent	Number	Percent	Number	Percent
White	164	21.5%	99	50.5%	65	11.5%
Black	12	1.6%	12	6.1%	0	0.0%
American Indian, Eskimo, Aleut	504	66.1%	4	2.0%	500	88.2%
Asian or Pacific Islander	44	5.8%	42	21.4%	2	0.4%
Other race	39	5.1%	39	19.9%	0	0.0%
Total population	763	100.0%	196	100.0%	567	100.0%
Hispanic origin, any race	62	8.1%	59	30.1%	3	0.5%
Total minority population	605	79.3%	102	52.0%	503	88.7%
Total non-Minority population (White non-Hispanic)	158	20.7%	94	48.0%	64	11.3%

Source: U.S. Census 1990 STF2.

Table 3.7 Population composition by age and sex for St. Paul, 1990 and 2000.

	1990		2000	
	N	%	N	%
Male	478	62.6%	294	55.3%
Female	285	37.3%	238	44.7%
Total	763	100%	532	100%
Median Age	NA		31.9 years	

Notes: N - number of individuals.
NA - data not available.
% - percentage of individuals.
Source: U.S. Bureau of Census

Table 3.8 Group quarters housing information for St. George, 1990 and 2000.

Year	Total Population	Group Quarters Population		Non-Group Quarters Population	
		Number	Percent of Total Population	Number	Percent of Total Population
1990	138	0	0.0%	138	100.0%
2000	152	0	0.0%	152	100.0%

Source: U.S. Census 1990 STF2, Census 2000 Summary File 1.

Table 3.9 Ethnicity and group quarters housing information for St. George, 1990.

Race/Ethnicity	Total Population		Group Quarters Population		Non-Group Quarters Population	
	Number	Percent	Number	Percent	Number	Percent
White	7	5.1%	0	0.0%	7	5.1%
Black	0	0.0%	0	0.0%	0	0.0%
American Indian, Eskimo, Aleut	131	94.9%	0	0.0%	131	94.9%
Asian or Pacific Islander	0	0.0%	0	0.0%	0	0.0%
Other race	0	0.0%	0	0.0%	0	0.0%
Total population	138	100.0%	0	0.0%	138	100.0%
Hispanic origin, any race	0	0.0%	0	0.0%	0	0.0%
Total minority population	131	94.9%	0	0.0%	131	94.9%
Total non-minority population (White non-Hispanic)	7	5.1%	0	0.0%	7	5.1%

Source: U.S. Census 1990 STF2.

Table 3.10 Population composition by sex for St. George, 1990 and 2000.

	1990		2000	
	N	%	N	%
Male	64	46.4%	73	48.0%
Female	74	53.6%	79	52.0%
Total	138	100.0%	152	100.0%
Median Age	NA		33.0 years	

Notes: N - number of individuals.
NA - data not available.
% - percentage of individuals.
Source: U.S. Bureau of the Census.

3.7.2 Commercial Harvest

The Pribilof Islands and its fur seal population were first discovered by Russian explorers in June 1786. From 1786 to 1828 the Russians, with Aleut labor, harvested an average 100,000 fur seals per year, primarily pups (Roppel, 1984). It was not until 1822 that bulls were protected and restrictions placed on the number of pups killed (Scheffer et al., 1984). From 1835 to 1839 an average of 70,000 seals was harvested annually. Beginning in 1847, the number of males taken was controlled and the harvest of females was stopped. About 30,000 to 35,000 fur seals

were killed annually during the last 10 years of Russian occupation. The population was reportedly thriving and was sustaining an annual harvest of several thousand males when the United States purchased Alaska in 1867 (York and Hartley, 1981). During the first two years following the purchase of Alaska by the United States, the fur seal harvest ensued without regulations. For example, approximately 240,000 were taken in 1868 alone. There has also been a traditional harvest of young of the year seals for personal use. Meanwhile, many fur seals were also harvested at sea (pelagic sealing).

The history of pelagic sealing (1875-1909), its impact on the fur seal population, and a subsequent treaty banning pelagic sealing is found in Roppel and Davey (1965). At the peak of pelagic sealing (1891-1900), more than 42,000 fur seals (mostly lactating females) were taken annually in the Bering Sea (Scheffer et al., 1984). In addition, pelagic sealing was removing a large but unknown number of fur seals from waters off British Columbia (Scheffer et al., 1984). Because the takes were greatly reducing the fur seal stock, Great Britain (for Canada), Japan, Russia, and the United States ratified the Treaty for the Preservation and Protection of Fur Seals and Sea Otters in 1911. The treaty prohibited pelagic sealing and required a reduction in the taking of seals on the land. The population grew rapidly after the cessation of pelagic sealing until the mid 1940s. There was no commercial harvest from 1912-1917. From 1918 to about 1941, the Pribilof Island fur seal stock grew at 8 percent per year under a harvest which ranged from 15,862 in 1923 to 95,016 in 1941. In 1941, Japan abrogated the 1911 Convention on the grounds that fur seals were too numerous and were damaging her fisheries; after World War II, a similar concern on the part of Japan was important in negotiating the 1957 fur seal Convention (Scheffer, 1980). No commercial harvest took place in 1942. The take from 1943 to 1955 averaged about 70,000 per year.

In 1957, the signatories of the 1911 Treaty ratified a new agreement, the Interim Convention on the Conservation of North Pacific Fur Seals, for the conservation, research, and harvesting of fur seals. During those negotiations, calculations presented by the United States suggested that maximum sustained productivity would occur at lower female population levels than those of the early 1950s. These projections postulated higher pregnancy and survival rates from a smaller herd (Anonymous, 1955). Consistent with that analysis, from 1956 to 1968, a total of about 300,000 female fur seals were killed on the Pribilof Islands (York and Hartley, 1981). Concurrently, 30,000 to 96,000 juvenile males were harvested each year (Lander and Kajimura, 1982), and a pelagic collection of about 16,000 females was taken for research purposes by the United States and Canada during 1958-1974 (York and Hartley, 1981).

The Pribilof Islands fur seal population did not react as expected to the herd reduction program. Kajimura et al. (1979) showed neither a substantial decrease in age at first pregnancy nor an increase in pregnancy rates as the population was reduced. Also, increased survival rates did not overcome losses to the population resulting from intentional herd reduction. These changes generated speculation that some natural factor or combination of factors had prohibited the expected recovery of the herd. Clearly, one or more factors, whether natural or man-made, adversely affected the recovery of the herd and caused extreme fluctuations in year class survival and a much reduced production of young males (Roppel, 1984). The United States believed it necessary to establish a research control area because of the failure of the Pribilof Islands population to respond as anticipated to changes in the management scheme started in 1956. Therefore, in 1973, a moratorium on the commercial harvest of male fur seals was established at St. George Island (Roppel, 1984), while the commercial harvest on St. Paul Island

continued. Thus, the first long-term study of behavior in the history of fur seals on the Pribilof Islands began in 1973 (Roppel, 1984). Meanwhile, on St. Paul Island, management regulations changed very little between 1973-1979, and harvests ranged from 24,000 to 27,000 animals per year (Harry and Hartley, 1981).

The authority of the 1957 Convention was extended in 1963, 1969, 1976 and 1980. Under the terms of the 1980 extension, the Convention expired on 14 October 1984. In consultation with the U.S. Departments of State and Justice, and the Marine Mammal Commission, the United States declined to sign an extension. It was determined that no commercial harvest could be conducted under existing domestic law and, therefore, the commercial harvest on St. Paul Island was terminated. Management of the fur seal then reverted to the MMPA.

3.5.3 Subsistence Harvest

The Fur Seal Act of 1966 authorized the taking of fur seals by for subsistence purposes. 16 U.S.C. 1153(b) provides Indians, Aleuts, and Eskimos who live on the Pribilof Islands are authorized to take fur seals for subsistence purposes as defined in 16 U.S.C. 1379(f)(2) under such conditions as recommended by the Commission and accepted by the Secretary of State pursuant to regulations promulgated by the Secretary.

Following the termination of the commercial harvest, NMFS issued an emergency interim rule on July 8, 1985, to govern the subsistence taking of fur seals for the 1985 season under the authority of section 105(a) of the Fur Seal Act. A final rule was published on July 9, 1985. The subsistence harvest of northern fur seals on the Pribilof Islands, Alaska, is governed by regulations found in 50 CFR part 216 subpart F--Taking for Subsistence Purposes. These regulations were published under the authority of the Fur Seal Act, 16 U.S.C. 1151, *et seq*., and the MMPA, 16 U.S.C. 1361, *et seq*. (see 51 FR 24828, July 9, 1986). The purpose of these regulations was to limit the take of fur seals to a level providing for the subsistence needs of the Pribilof Aleuts using humane harvesting methods, and to restrict taking by sex, age, and season for herd management purposes.

The structure and conduct of the subsistence harvest established by the regulations is essentially the same as were developed and applied to the commercial harvest whereby a harvest foreman makes the onsite decisions and supervises the entire harvest event. The specific locations from and frequency by which seals can be harvested are specified by the regulations which permit only the taking of sub-adult male seals from haulout areas. The intentional taking of females or disturbance of the breeding rookeries are prohibited. Only experienced sealers can participate in the most important elements of the harvest which are carefully organized and managed by the harvest foreman.

Additionally, a certified veterinarian with extensive expertise regarding fur seals, is contracted by NMFS to serve as the Humane Observer for the harvest. The Humane Observer is not required by regulations but has been mutually agreed upon by the NMFS and Pribilof tribal governments as an essential part of the harvest to ensure it is pursued and conducted in a humane manner. The Humane Observer works carefully and interactively with the harvest operation and foreman regarding the physical parameters and condition of the seals with particular attention to preventing the animals from becoming overheated (hyperthermic). The harvest foreman and Humane Observer discuss the onsite environmental conditions and

circumstances prior to the decision by the harvest foreman as to whether and how the harvest event will proceed.

If the decision is to proceed, the harvest crew is assembled and the harvest foreman selects those who will proceed to the haulout area to round up a group of sub-adult males from the herd which is then slowly driven to the harvest area. The round-up crew is accompanied by the Humane Observer and is very careful to select that part of the herd comprised mostly of 2 - 4 year old males as the harvest group. Females and any male seals beyond 4 years old are excluded from the drive to the harvest areas as soon as possible. Pups are very rarely involved in the round-up and drive due to the fact that they are seldom found on the haulout areas during the harvest season.

Once the drive ends at the harvest area, the animals are left to rest and cool down in a loose group around which the harvest foreman stations and directs the "watchboys," usually ranging in age from 9 - 18 years old, around the group to keep it together. The watchboys also look over the assembled seals to identify animals that appear to be sick, injured, entangled in marine debris or otherwise deserve particular attention. These animals are then dealt with after consultations between the harvest foreman and Humane Observer. If the animals can be safely handled by the harvest crew, the harvest foreman directs such actions as necessary to either remove marine debris from entangled animals or to assist the Humane Observer with the examination and assessment of sick or injured seals.

When the harvest foreman and Humane Observer decide that the grouped seals are sufficiently rested and cooled, the foreman directs the "canmen" to begin separating out small groups of 5-20 seals from the larger assembled group by a process of inserting a large stick into the opening of a square 5 gallon metal can and running it along the ground. This disturbance effectively separates out the harvestable seals and the remainder are allowed to return to the haulout areas from which they came.

Once this smaller group is isolated from the others, the foreman directs the "stunners" to begin taking the animals down. This is the most important part of the harvest event and thus, the stunners are those individuals who are the most experienced and/or proficient in using a hardwood club approximately 5-6 feet long to deliver a swift blow to the back of the animal's head. The skull of a northern fur seal is relatively thin and therefore, such blow effectively and immediately renders the animal unconscious.

As each seal is taken down by the stunners, one or more of the most highly experienced sealers make a quick incision to the chest cavity to disable the diaphragm and heart thereby ensuring the animal will not regain consciousness or incur suffering. Once the harvestable seals have been taken, the harvest crew proceeds to butcher the carcasses as soon as possible to prevent spoilage and the meat is distributed to individual subsistence households or frozen for future use by the community. The above process is repeated throughout the harvest season.

To initiate the harvest, NMFS publishes a proposed annual subsistence harvest estimate. The purpose of the notice is to provide an estimate for the annual subsistence need for St. Paul and St. George Islands. To minimize negative effects on the population, the subsistence harvest has been limited to a 47-day harvest season (June 23-August 8) during which only sub adult male seals may be taken.

The AA is required to terminate the harvest when it is determined that the subsistence needs of the Pribilof Aleuts have been met or on August 8 of each year, whichever comes first. From 1985 to 1992, the regulations allowed for extending the harvest period if the subsistence needs of the Pribilof Aleuts had not been met. The AA could extend the harvest period until September 30 if, by August 8, the subsistence needs of the Pribilof Aleuts were not met, and the number of female seals taken during the harvest was low. In 1986 and 1987 extensions to the harvest season were requested and granted. However, the extensions of the harvest beyond the first week of August resulted in an increased number of female fur seals taken. In response, NMFS announced its intent to amend its regulations to eliminate the extension option for 1989 and subsequent years (53 FR 28887, Aug. 1, 1988), although no further action was taken by NMFS at that time. Extensions were requested and granted after that date without complications in the harvest.

Following the August 1, 1988, notice by NMFS, the Aleut Community of St. Paul Island requested a change in the Fur Seal Act regulations to allow the subsistence harvest to begin June 23, 1 week earlier than the June 30 start date in NMFS' regulations. They cited a desire for seal meat by community members before June 30, a lack of meat remaining from the previous year's take, and the possible inability to harvest their quota of seals in the absence of the harvest extension option. On June 3, 1991, NMFS published a proposed rule to eliminate the extension option and to begin the harvest one week earlier (56 FR 25066). The final rule was published on July 31, 1992 (57 FR 33900).

This method of harvesting fur seals on the Pribilofs described above was developed over the many decades of the commercial harvest and was determined by comparative study and analysis with other methods to be the most effectively humane and least disruptive possible. Further, the regulations governing the harvest require that it be conducted and managed in the most non-wasteful manner possible and prior to the adoption of co-management as the preferred approach regarding the harvest, a NMFS employee was present in the field at each individual harvest event in addition to the harvest foreman and Humane Observer, to monitor the conduct of harvest per the regulations, document the number of seals taken and record a variety of other information. At the end of each harvest season, the Humane Observer and NMFS harvest representative provided final harvest reports to the NMFS/AKR/PRD.

These established harvest methods have remained unchanged since the adoption of co-management. Among the most important changes regarding the annual harvest is the onsite presence and documentation of each individual harvest event by the NMFS harvest representative. These functions are now fulfilled by the respective local tribal governments. The Humane Observer component remains the same but the final harvest report previously written by the NMFS representative is now produced by the tribal governments and provided to the NMFS/AKR/PRD.

Prior to the 1994 subsistence harvest, NMFS, in cooperation with the tribal governments of each island, conducted an annual household survey of the local subsistence communities to estimate the number of seals required to meet their subsistence needs for that year. NMFS would then publish the proposed estimates in the FR for comment prior to finalizing the number of seals that could be taken on each island. These estimates were set for each island and consisted of a lower and upper range.

On May 13, 1994, NMFS published a proposed rule to change the manner in which the harvest take ranges were established by setting the ranges for a 3-year period rather than annually. The reason for this change was that the annual household survey of subsistence needs regarding fur seals was time consuming, regarded as intrusive by some local residents, and since the number of seals taken for subsistence purposes had been relatively stable and consistent each year since 1989, it was determined that setting the ranges for a 3-year period would be as satisfactory an approach as the annual process. A final rule was published on July 12, 1994 (59 FR 35471) setting the ranges for the period 1994-1997 at the same levels as had been established for the 1992 and 1993 harvests.

In September 1996, NMFS requested that the Tribal Government of each island determine the number of fur seals that would be needed by their communities each year for the 3-year period 1997 through 1999. The response from the St. Paul Island Tribal Government was to maintain the current range of 1,645-2,000 seals. The St. George Island tribal government requested that the lower end range be increased from 281 to 300 seals and that the upper bound remain at 500 seals. The approach was repeated for the period 2000-2002 and the same harvest ranges were established (final rule published on June 21, 2001). The preferred alternative will continue those take ranges into future harvests.

Chapter 4 Environmental Consequences

This chapter forms a scientific and analytic baseline for comparisons of alternatives. The Pribilof Islands and the surrounding Bering Sea marine environment constitute a unique ecosystem and support high concentrations of marine mammals, seabirds, fish, and invertebrates. This section evaluates the probable environmental, biological, cultural, social and economic consequences of the alternatives and reviews those activities that, in addition to authorizing a harvest, may cumulatively impact northern fur seals and the environment.

Differences between direct and indirect effects are primarily linked to the time and place of impact. Direct effects are those that result from the action and occur at the same time and place. Indirect effects are those reasonably foreseeable effects that are caused by the action but that may occur later and farther from the location of the direct effects (40 CFR 1508.27).

Cumulative effects are the incremental effect of the proposed action when added to the effects of past, other present, or reasonably foreseeable future actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place over time. For example, the intent of the alternatives is to develop a harvest management range that provides for the subsistence needs of the communities. However, the effects of the alternatives must also be evaluated as part of all relevant resources and activities within the action area.

4.1 Thresholds and Criteria for Determining Significance of Alternatives

Significance is determined by considering the context in which the action will occur and the intensity of the action. The context in which the action will occur includes the specific resources, ecosystem, and the human environment affected. The intensity of the action includes the type of impact (beneficial versus adverse), duration of impact (short versus long-term), magnitude of impact (minor versus major), and degree of risk (high versus low level of probability of an impact occurring). Further tests of intensity include: (1) impacts on public health or safety; (2) impacts on endangered or threatened species, marine mammals, or critical habitat of these species; (3) degree of controversy; (4) impacts on unique geographical areas; (5) degree of uncertainty of impacts to human environment or involvement of unique risks; (6) cumulative adverse effects; (7) potential to effect historic places or cause loss of significant scientific, cultural or historical resources; (8) potential to introduce or spread nonindigenous species; (9) likelihood to establish a precedent for future actions, and (10) potential to violate laws or requirements for the protection of the environment. (NAO 216-6, Section 6.02).

Continuing the subsistence harvest at present levels is not considered as precedent setting or controversial. Discontinuing the harvest would be considered controversial. The action will not violate a Federal, State, or local law, or requirement imposed for the protection of the environment. Since the subsistence harvest takes only subadult males in low quantities (see section 4.2) the northern fur seal population will not be significantly impacted and there are no irreversible or irretrievable commitments of resources.

The terms “effects” and “impacts” are used interchangeably in preparing these analyses. The CEQ regulations for implementing the procedural provisions of NEPA, also state “Effects and impacts as used in these regulations are synonymous.” (40 CFR §1508.8). The terms “positive”

and "beneficial," or "negative" and "adverse" are likewise used interchangeably in this analysis to indicate direction of intensity in significance determination.

Each of the following sections contains a summary of the direct, indirect or cumulative effects of the action using criteria established to determine significance, insignificance or unknown for each resource, species, or issue being evaluated. The criteria for significance and determinations of significance are summarized in a table in each section, or when the same criteria were used to evaluate subsequent species, the reader is referred back to the appropriate table.

The following ratings for significance are used; significant (beneficial or adverse), conditionally significant (beneficial or adverse), insignificant, and unknown. Definitions of the criteria used for these rankings are included in each section. Where sufficient information is available, the discussions and rating criteria used are quantitative in nature. In other instances, where less information on the direct and indirect effects of the alternative are available, the discussions and rating criteria used are qualitative in nature. In instances where criteria do determine an aspect of significance (significant negative, insignificant, or significant positive) because that aspect is not logically describable, no criteria are noted. These situations are termed "not applicable" or NA in the criteria tables. See below for further information:

S+ Significant beneficial effect in relation to the reference point (the reference point for effects of the harvest would be the recovery rate without a harvest).

S- Significant adverse effect in relation to the reference point and based on ample information.

CS+ Conditionally significant beneficial effect in relation to the reference point. This determination may be lacking in quantitative data and information, however, the judgement of the NMFS analysts who addressed the topic is that the alternative will cause an improvement in the reference point condition.

CS- Conditionally significant adverse effect in relation to the reference point; it may be based on insufficient data and information, however, professional judgement is that the alternative may cause a delay in the reference point condition (delay in recovery) or loss of tradition or culture.

I Insignificant effect in relation to the reference point; this determination is based upon information and data, along with the judgement of NMFS analysts, which suggests that the effects are small and within the "normal variability" surrounding the reference point.

U Unknown effect in relation to the reference point; this determination is characterized by the absence of information and data, or equivocal determination. In instances where the information available is not adequate to assess the significance of the impacts on the resource, species, or issue, no significance determination was made, rather the particular resource, species, or issue was rated as unknown.

In this analysis we use the term "conditionally significant" to describe a significant impact that is evaluated from incomplete or unavailable information. The conditional qualifier implies that

significance is assumed, based on the credible scientific information and professional judgement that are available, but more complete information is needed for certainty. In other words, we may find that an impact has a significant adverse or a significant beneficial effect, but we do not have a high level of certainty about that finding. This approach provides a heightened sense of where information is lacking, and may guide research efforts in the future. An interesting point to make about this approach is that if an impact is rated as insignificant, there is a high level of confidence that the impact is truly insignificant, or it would have been moved to the "conditional significance" category.

4.1.1 Effects of the Harvest on the Northern Fur Seal Resource

The biological criteria used to measure the direct effects of the harvest on the northern fur seal resource for significance was a comparison of the total number of takes (level of harvest) to the Potential Biological Removal (PBR) level of the northern fur seal stock. A PBR calculation is the most applicable measure of significance for the direct effects of this particular action.

Under the 1994 reauthorized MMPA, the PBR is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a recovery factor: therefore PBR = Nmin × 0.5Rmax × F_R. The recovery factor (F_R) for this stock is 0.5, the value for depleted stocks under the MMPA (Wade and Angliss 1997). Thus, for this stock of northern fur seals, PBR = 16,162 animals (751,714 × 0.043 × 0.5)(Angliss and Lodge 2003).

4.2 Direct Effects of the Alternatives on Fur Seals

Since the first Aleuts were brought to the islands in the late 1700s, fur seal meat has been a dietary staple. The Pribilof Aleuts use many parts of the fur seal for food. The number of seals estimated to be needed for subsistence purposes has varied dramatically since 1985, ranging from greater than 15,000 per year (upper limit in the 1985 EIS), to the current estimate of less than 2,000 when both islands are combined. Alaska Natives residing on the Pribilof Islands are allowed an annual subsistence harvest of northern fur seals, with a take range determined from annual household surveys. The estimate of subsistence needs for fur seals on the Pribilofs provided in the preamble to the 1985 Interim rule ranged from 3,358 to more than 15,000. These estimates were derived from a variety of historical records and extrapolations based on subsistence use and the actual numbers harvested never approached the upper estimate of need. A total of 3, 713 seals were harvested in 1985. The harvest report was published in the Marine Fisheries Review in 1986. The actual number needed and the manner in which the seals were taken was the subject of controversy between the cessation of the commercial harvest and the early 1990s, resulting in litigation between NMFS and conservation groups over this practice. Since 1995, the harvest has stabilized and the harvest is not controversial.

Regulations governing the subsistence harvest are more restrictive regarding sex, size and age of harvested seals than those in effect during the years of the commercial harvest. Only subadult males between 2 and 4 years of age, and greater than 124 centimeters in length, are allowed to be taken in the subsistence harvest. The actual number of seals taken for subsistence each year has been less than that estimated since 1997 and the harvest has become more efficient each year (see Table 1).

From 1986 to 1996, the annual subsistence harvest level averaged 1,412 and 193 for St. Paul and St. George Islands, respectively, for a total of 1,605. The subsistence harvest levels from

1997-2001 were 1,380, 1,558, 1,193, 750, and 781, respectively. The average subsistence harvest level for1997-2001 is 1,132. Only juvenile males are taken in the subsistence harvest, which likely results in a much smaller impact on population growth than a harvest of equal proportions of males and females. A few females (3 in 1996, 3 in 1997, and 5 in 1998) were accidentally taken. Subsistence take in areas other than the Pribilof Islands is known to occur, though believed to be minimal. This total number of seals taken in the subsistence harvest is only a small fraction, and arguably an insignificant level, relative to the number of seals taken previously in the commercial harvest. The subsistence take since 1985 is not considered a factor in the depleted determination.

4.2.1 Setting the Harvest Range: The subsistence take ranges and actual harvest levels since the authorization of the subsistence harvest in 1985 are provided in Table 1. The number of northern fur seals harvested on St. Paul Island since 1986 has ranged from 597 (2001) to 1,710 (1987) (Table 1). The annual subsistence takes on St. George Island since 1986 have ranged from 92 (1987) to 319 (1993) seals (Table 1). The actual number of animals harvested has never reached the upper end of the estimated take range and has reached the lower range only once on St. Paul (1991) and twice on St. George (1991, 1993) in the past 13 years (1989-2002). The average number of seals harvested during the past 10 years on St. Paul and St. George Islands has been 1,170 (range: 597 to 1,616) and 216 (range: 121 to 319), respectively.

Table 1. Subsistence Harvest Levels for Northern Fur Seals on the Pribilof Islands, 1985-2003 (pers. comm. Dave Cormany, NMFS).

	Subsistence Take Ranges		Actual Harvest Levels	
Year	St.Paul	St.George	St.Paul	St.George
1985	–	–	3,384	329
1986	2,400-8,000	800-1,800	1,299	124
1987	1,600-2,400	533-1,800	1,710	92
1988	1,800-2,200	600-740	1,145	113
1989	1,600-1,800	533-600	1,340	181
1990	1,145-1,800	181-500	1,077	164
1991	1,145-1,800	181-500	1,645	281
1992	1,645-2,000	281-500	1,482	194
1993	1,645-2,000	281-500	1,518	319
1994	1,645-2,000	281-500	1,616	161
1995	1,645-2,000	281-500	1,525	260
1996	1,645-2,000	281-500	1,591	232
1997	1,645-2,000	300-500	1,153	227
1998	1,645-2,000	300-500	1,297	256
1999	1,645-2,000	300-500	1,000	193
2000	1,645-2,000	300-500	754	121
2001	1,645-2,000	300-500	597	184
2002	1,645-2,000	300-500	648	203
2003	1,645-2,000	300-500	522	132

4.2.2 Effects of the Alternatives on Fur Seals

4.2.2.1 Alternative 1: Status Quo

The direct effects of this alternative on the fur seal stock would be no different from those for the past three years of the harvest. The harvest has been measured for effect by comparing the harvest level against the PBR value in each assessment of the fur seal stock in the Alaska Marine Mammal Stock Assessment Reports (SARS) conducted annually by NMFS. Generally, the potential effect of subsistence harvest increases in significance and intensity as it approaches PBR and decreases as the level of harvest approaches zero. If the harvest level is less than 10 percent of PBR, the level is considered by NMFS to be a negligible impact. Furthermore, all the harvested animals, with very few exceptions, are non-breeding males and therefore do not contribute to the population growth. The subsistence harvest of these sub-adult males is not thought to have any impact on the population growth rates and therefore an increase or decrease in numbers harvested, as long as it was on males within this age-group, would likely result in less of an impact than a harvest including all sex and age classes. This subsistence harvest would likely have an insignificant effect.

4.2.2.2 Alternative 2: No Action

Establishing take levels for the subsistence fur seal harvest on the Pribilofs lower than those previously authorized (down to 0 from 2,500) would not have an adverse impact on the northern fur seal population. Therefore, lowering the harvest level to zero would have an insignificant effect.

4.2.2.3 Alternative 3: PBR

This alternative would allow a harvest of up to 16,162 seals. Generally, the potential effect of subsistence harvest increases in significance and intensity as it approaches PBR and decreases as the level of harvest approaches zero. Pup production has been declining. During 1998-02, pup production declined 5.14% per year (SE = 0.26%) on St. Paul Island and 5.35% per year (SE = 0.19%) on St. George Island. Counts in both 2000 and 2002 were lower than previous years. Removing more than 2% (16,162 / 751,714) of the animals from a declining population could hasten the decline or impede recovery. If harvest reached the PBR of 16,162 animals, other factors such as regime shift, fishing, or unknown factors may have more of an impact on the population. Assuming the subsistence harvest would take the PBR of northern fur seals, there would be a significant adverse effect to the population.

4.2.2.4 Alternative 4: 5 year average

Establishing take levels for the subsistence fur seal harvest on the Pribilofs lower than those previously authorized (down to 872 from 2,500) would not have an adverse impact on the northern fur seal population. Since the harvest consists of relatively low number of subadult males, and recruitment of males into the breeding population is not a limiting factor in population recovery, setting the harvest at a level less than the current levels would not likely have a beneficial effect. Therefore, lowering the harvest level would have an insignificant effect.

4.2.3 Effects of the Alternatives - Cultural Values and Co-Management

4.2.3.1 Effects of Management Alternatives on St. Paul and St. George Human Populations

In April 1994, the MMPA was amended to include Section 119 "Marine Mammal Cooperative Agreements in Alaska." Section 119 formalizes the rights of Alaska Native Organizations to participate in conservation-related co-management of subsistence resources and their use. NMFS and the Tribal Government of St. Paul Island, and the Tribal Government of St. George Island, entered into cooperative agreements in 2000 to work in partnership to achieve the following: Promote the conservation and preservation of fur seals and sea lions; to use additional knowledge, wisdom and values, and conventional science in research, observation, and monitoring efforts to establish the best possible management actions for the protection and conservation of fur seals and sea lions on the Pribilof Islands; to establish a process of shared local responsibilities regarding the management and research of fur seals and sea lions on behalf of the citizens of the United States; to identify and resolve through a consultative process any management conflicts that may arise in association with fur seals and sea lions on the Pribilof Islands; and to provide information to hunters and the affected community, as a means of increasing the understanding of the sustainable use, management, and conservation of fur seals and sea lions. A most significant tenet in this agreement is the concept of shared management between members of the Tribal Governments and NMFS in the conservation and management of fur seals and sea lions for the year 2000 and thereafter.

As the primary customary/traditional users of the fur seals and sea lions in the Bering Sea Region, the Aleut Communities of St. Paul and St. George are committed to the long term sustainable use of these animals for cultural continuity, food, clothing, arts, and crafts. A key to the success of this partnership is to incorporate the spirit and intent of co-management by building trust and by establishing close cooperation and communication between the Parties in the agreements.

It is difficult to quantify this understanding for purposes of establishing criteria for NEPA. However, it can be generally considered that any departure from this agreement for purposes of establishing harvest ranges would be considered to have an adverse effect. The agreements provide for full partnership and full participation in decisions affecting the management of marine mammals used for subsistence purposes on the Pribilof Islands. An insignificant finding, then, would be one that is consistent with the intent and language of the agreements.

4.2.3.2 Evaluation of Alternative 1: Status Quo - and Basis for Selection of Preferred Alternative

Establishing take ranges at the same levels as those for the period 1997-1999 maintains a level of take that has evolved and stabilized through years of cooperatively managing the subsistence harvest of northern fur seals on the Pribilof Islands. Setting the limit higher than the actual recent harvest gives the communities flexibility and fulfills their needs, now and in the future. The subsistence component of these communities has remained an important, consistent and supporting factor in the personal, economic and traditional character of the Pribilof Islands which NMFS and local tribal governments believe will be preserved by this alternative. A continued harvest at this level would preserve the traditional skills, cultural values and knowledge and would pass this tradition on to younger hunters. Under co-management, wise stewardship of the resource can be exercised. For these reasons, this is the preferred alternative by NMFS. The direct effects of this alternative would be fostering traditional skills and traditions resulting from the harvest, and a cooperative co-management agreement that will be followed. The direct effects of establishing take ranges and allowing the harvest to go forward

as defined have been agreed upon by Parties in the cooperative agreements and are therefore considered to have a significant beneficial effect.

4.2.3.3 Evaluation of Alternative 2: No Action

The no action alternative would eliminate all legal harvest. The cessation of Native subsistence of northern fur seals would result in a loss of tradition and cultural values. Techniques, knowledge and values associated with the hunt would not be passed on to the younger generation. A traditional Native food would be lost and handicrafts done from northern fur seals would not be done or learned by the younger generation. Since hunters generally have social standing, the social order and sense of personal value may be lost if the hunt is discontinued. If the hunt was continued after a period of time and the older hunters were not around to pass on the skills and traditions of the present hunt, the new hunt would probably be inefficient and wasteful.

Co-management agreements would be null. The cooperative working relationship that has slowly developed over many years would be erased and replaced by a negative, or perhaps adversarial relationship between the Native communities and NMFS. The loss of traditional values and skills and the elimination of an effective co-management agreement would be the direct result of implementing the no action alternative. For these reasons the no action alternative would have a significant adverse effect.

4.2.3.4 Evaluation of Alternative 3: PBR

Setting the harvest limit at PBR, or 16,162 animals would preserve values and traditions as in Alternative 1, the Status Quo. The co-management agreement would be rewritten to address the new limit. Since there is not a demand for this many animals, harvest would occur at a much lower level. Co-management would have the opportunity to exercise wise stewardship of the resource. There is precedence for harvesting only what is needed as reflected by the harvest occurring at lower levels than the past harvest limit of 2,500 animals (see Table 2.1). Traditional hunting skills and subsistence traditions would continue. For these reasons Alternative 3 would have a significant beneficial effect on subsistence values and traditions.

4.2.3.5 Evaluation of Alternative 4: 5 year average

This alternative would establish take levels for the subsistence fur seal harvest on the Pribilofs lower than those previously authorized. This would set the subsistence harvest limit to 872 northern fur seals, with up to 705 harvested from St. Paul and 167 harvested from St. George. When the five year averages are examined, the harvest on St. Paul exceeded the limit set in this alternative (705) two years out of five, and the harvest on St. George exceeded the limit set in this alternative (167) three years out of five. The variability of the harvest occurs for many reasons. Weather conditions and availability of animals vary year by year. Demand may change. The timing restriction on the hunt overlaps with fishing seasons, and many of the hunters are also fishermen. Thus, they may be unavailable to hunt in certain years. With a reduced harvest, the subsistence needs of the local communities may not be adequately met in certain years. The economic and logistical difficulties associated with small, rural and remote Alaskan communities such as those of St. Paul and St. George Islands, create a situation where subsistence use is an important source of food and a major component of the traditional character of the communities. Therefore, establishing take ranges that do not meet the

subsistence needs of the local communities each year may impose a variety of significant hardships for individual residents and the community at large.

Although traditional values and traditions would be preserved (at a reduced level) under this alternative, subsistence needs may not be met in specific years and the cooperative tradition may be eroded. Thus, since subsistence needs would not be met in certain years, this alternative would have a conditionally significant adverse effect on cultural values and traditions.

4.2.4 Impacts on Endangered or Threatened Species

The ESA establishes several levels of classification and criteria regarding the listing of wildlife species whose populations have reached levels warranting concern. Two of those levels are Threatened and Endangered. The northern fur seal species is not listed, or under consideration for listing, under the ESA.

The waters of the Bering Sea within the described project area contain several endangered species of whales (humpback, blue, right, sei, sperm, bowhead, and fin), short tailed albatross, Steller's eider, Spectacled eider, and Steller sea lions. The direct effects of any of the alternatives considered in this proposed action will have an insignificant effect on listed great whales or seabirds.

4.2.4.1 Steller Sea Lions

The Steller sea lion is listed as endangered west of 144° West longitude. The eastern stock remains listed as threatened. Because the western stock of Steller sea lion harvest would generally occur at the same time and place as the northern fur seal harvest, it is included in the analyses.

4.2.4.1.1 Alternative 1: Status Quo

Direct interaction of the subsistence harvest on listed species is most likely for Steller sea lions that occur on the islands of St. Paul and St. George. An interaction between the fur seal subsistence harvest and Steller sea lions could only occur through disturbance of a sea lion that might be hauled out on a rookery where juvenile male fur seals are being rounded up for harvest. NMFS believes this unlikely due in large part to the territorial behavior of fur seals on the rookeries. More simply stated, Steller sea lions do not occupy the active areas of the rookeries and therefore would not be disturbed by harvest activity. Although Steller sea lions are also harvested for subsistence on the Pribilof Islands, they are not taken, either directly or indirectly, as a result of this action. If subsistence users harvest northern fur seals in lieu of Steller sea lions, it would result in less pressure on an Endangered species. There is an insignificant direct effect on Steller sea lions under this alternative.

4.2.4.1.2 Alternative 2: No Action

The elimination of the northern fur seal subsistence harvest would have an insignificant direct effect on Steller sea lions.

4.2.4.1.3 Alternative 3: PBR

Setting the subsistence harvest limit equal to the potential biological removal (PBR), would have the same effect as Alternative 1, which is an insignificant effect on Steller sea lions.

4.2.4.1.4 Alternative 4: 5 year average

This alternative would set the subsistence harvest limit to 872 northern fur seals, with up to 705 harvested from St. Paul and 167 harvested from St. George. This alternative would have an insignificant direct effect on Steller sea lions.

4.2.5 Effects of the Alternatives on Other Non-listed Marine Mammals

4.2.5.1 Pinnipeds

The "other pinnipeds" group includes the harbor seal and the ice seals (spotted, bearded, ringed, and ribbon seals), and Pacific walrus. The actions described in the alternatives described will have an insignificant effect on ice seals.

In particular, the ice seal distributions tend toward seasonally or permanently ice-covered waters of the Beaufort, Chukchi, Bering, and Okhotsk Seas, which are generally north of most areas commercially fished for groundfish. The annual distribution of the seals depends on the extent of the sea ice, which can vary widely from year to year (Burns *et al.*, 1981a, b). The sea ice in the Bering Sea typically extends to the continental shelf break, but in heavy ice years, the ice edge can extend as far south as the eastern Aleutian Islands, while in light ice years, the ice edge can be as far north as St. Lawrence Island (Burns *et al.*, 1981b). Occasionally, individuals of each species can be found south of the ice edge in the Bering Sea, but infrequent contacts with the Pribilof Islands would not precipitate population level effects. The direct effects of all alternatives are expected to have insignificant effects on other pinnipeds because there is little to no spatial and temporal, or dietary overlap, of harbor seals, ice seals, and walruses with the Pribilof Islands.

4.2.5.2 Effects of the Alternatives on Other Non-Listed Species

Ten species of whales and dolphins occur in Alaskan waters and are protected under the MMPA (but not listed under the ESA) including: the gray whale, minke whale, beluga whale, killer whale, Pacific white-sided dolphin, harbor porpoise, Dall's porpoise and beaked whales (Baird's, Cuvier's and Stejneger's). At present there is no subsistence hunt with any of these species nor is it a traditional food on the Pribilofs. Even with a major change in the fur seal harvest, hunting of whales would probably not occur. In all cases, there is an insignificant effect of the alternatives on cetaceans. The alternatives would have an insignificant effect on non-listed birds.

4.2.6 Effects of Alternatives on Essential Fish Habitat (EFH)

EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. EFH may be effected through modifications to the nonliving substrate in which they live have been combined, and/or damage to small epifauna and infauna. There are insignificant direct and indirect effects on EFH.

4.2.7 Effects of Alternatives on Enforcement

Both, enforcement of the alternatives and safety measures taken to implement the preferred alternatives are shared responsibilities between NMFS and the two Tribal Governments as specified in the co-management agreements. The agreements have the following specifications with regard to enforcement on the rookeries and during the harvest:

> [from Agreement] To effectively implement this Agreement, the Parties agree that:
>
> The TGSNP [tribal government] recognizes the Secretary of Commerce's authority to enforce the provisions of the MMPA, ESA and Fur Seal Act applicable to the subsistence harvest of fur seals and sea lions; and
>
> NMFS recognizes the existing Tribal authority to govern and regulate their members and conduct regarding the traditional uses of fur seals and sea lions, and acknowledges tribal authority to conduct the following in cooperation with NMFS:
>
> 1. Conduct rookery disturbance monitoring and local enforcement upon closing of the rookeries and to monitor sea lion hunting activities;
>
> 2. Conduct access permitting for the fur seal viewing blinds and fur seal harvest;
>
> 3. Develop and implement Tribal ordinances governing the hunting of sea lions and harvesting of fur seal and provide NMFS with up to date Tribal ordinances;
>
> 4. Develop and implement effective local processes for informing the public regarding applicable Federal and Tribal laws and regulations;
>
> 5. Develop and implement cooperative enforcement plans between Federal, local and Tribal authorities; and
>
> 6. Review, recommend, and advise on revisions to federal regulations governing fur seals and sea lions.

As a result of the enforcement provisions of the agreement, there is no increased demand on NOAA Enforcement under the alternatives. Therefore, the direct effects of the alternatives on levels of required enforcement are insignificant.

4.2.8 Effects of Alternatives on Safety and Health

Safety factors are considered an inherent part of the action and it is incumbent upon the Tribal Governments to invoke safety measures while conducting the harvest. Implementing any alternative does not require a significant increase in special precautions that need to be taken prior to the harvest. To provide for the maximum in safety precautions several components of the co-management agreements focus on safety and Tribal Elders emphasize safety during the conduct of the harvests. Given the level of experience of hunters in the harvest, the hunting tradition passed from generation to generation, and the long tradition of conducting this harvest, the risks associated with the harvest alternatives (1, 3, 4) are considered insignificant. Since the harvest alternatives are considered insignificant, the effect of the elimination of the harvest in Alternative 2 is also considered insignificant. The direct and indirect effects of the alternatives on safety and health are insignificant.

4.3 Indirect Effects of the Alternatives

4.3.1 Indirect Effects on Fur Seals

4.3.1.1 Alternative 1- Status Quo

The effect of a subsistence harvest is largely direct. This is particularly so in Alternative 1 because all the harvested animals, with very few exceptions, are non-breeding males and therefore do not contribute to the population growth. The northern fur seal population is not male limited at this time. The subsistence harvest of these sub-adult males is not thought to have any long-term impacts on the population growth rates and therefore an increase or decrease in numbers harvested, as long as it was on males within this age-group, would likely result in less of an impact than a harvest of males and females. The subsistence harvest of these sub-adult males is not thought to have any impact on the population growth rates and therefore an increase in numbers harvested, as long as it was on males within this age-group, would have an insignificant impact. Any increase demonstrated by need as required under the regulations would still result in a harvest that was significantly less than PBR for this stock. Indirect effects on the fur seal stock, such as harassment of other fur seals are minor, and an insignificant effect has been determined for this alternative.

4.3.1.2 Alternative 2- No action

The harvest under this alternative is zero and so would have an insignificant effect on northern fur seals

4.3.1.3 Alternative 3- PBR

This alternative sets the harvest limit at 16,162 animals. If the harvest limit was taken, recruitment of males into the population would be substantially reduced. This may impact the breeding success of the population and reduce overall recruitment of both males and females into the population in the future. This would slow recovery or increase the decline of the population of northern fur seals. Assuming the subsistence harvest would take the allowable limit of northern fur seals, there would be a conditionally significant adverse effect to the population.

4.3.1.4 Alternative 4- 5 year average

Since harvest under this alternative is less than under Alternative 1 (872 vs. 2500) effects would be insignificant (as in Alternative 1, see 4.3.1.1).

4.3.2 Indirect Effects of the Alternatives on Cultural Values and Co-Management

4.3.2.1 Evaluation of Alternative 1- Status Quo

Establishing take ranges at the same levels as those for the period 1997-1999 maintains a level of take that has evolved and stabilized through years of cooperatively managing the subsistence harvest of northern fur seals on the Pribilof Islands. Setting the limit higher than the actual recent harvest gives the communities flexibility and fulfills their needs, now and in the future. Under co-management, wise stewardship of the resource can be exercised. For these reasons,

this is the preferred alternative by NMFS. The indirect effects of this harvest are continued cooperative co-management, the fostering of goodwill and trust between the parties, and a continued responsible harvest. This alternative lays the groundwork for responsible management to continue in the future. Alternative 1 is therefore considered to have significant beneficial indirect effects.

4.3.2.2 Evaluation of Alternative 2: No Action

The no action alternative would eliminate all legal harvest. Since hunters generally have social standing, the social order and sense of personal value may be lost if the hunt is discontinued. If the hunt was continued after a period of time and the older hunters were not around to pass on the skills and traditions of the present hunt, the new hunt would probably be inefficient and wasteful.

Co-management agreements would be null. The cooperative working relationship that has slowly developed over many years would be erased and replaced by a negative, or perhaps adversarial relationship between the Native communities and NMFS. There would be a loss of trust between NMFS and the Native communities. Illegal harvest would probably become more prevalent. For these reasons the no action alternative would have a significant adverse effect.

4.3.2.3 Evaluation of Alternative 3: PBR

Setting the harvest limit at PBR, or 16,162 animals would preserve values and traditions as in Alternative 1, the Status Quo. Since there is not a demand for this many animals, harvest would occur at a much lower level. Co-management would have the opportunity to exercise wise stewardship of the resource. With such a high limit however, there is a possibility that a higher perceived need would develop. This may lead to higher harvests, possibly more waste, and a change in cultural values and traditions. Therefore, indirect effects are considered unknown with Alternative 3.

4.3.2.4 Evaluation of Alternative 4: 5 year average

This alternative would establish take levels for the subsistence fur seal harvest on the Pribilofs lower than those previously authorized. This would set the subsistence harvest limit to 872 northern fur seals, with up to 705 harvested from St. Paul and 167 harvested from St. George.

When the five year averages are examined, the harvest on St. Paul exceeded the limit set in this alternative (705) two years out of five, and the harvest on St. George exceeded the limit set in this alternative (167) three years out of five. The variability of the harvest occurs for many reasons. Weather conditions and availability of animals vary year by year. Demand may change. The timing restriction on the hunt overlaps with fishing seasons, and many of the hunters are also fishermen. Thus, they may be unavailable to hunt in certain years. With a reduced harvest, the subsistence needs of the local communities may not be adequately met in certain years. The economic and logistical difficulties associated with small, rural and remote Alaskan communities such as those of St. Paul and St. George Islands, create a situation where subsistence use is an important source of food and a major component of the traditional character of the communities. Therefore, establishing take ranges that do not meet the subsistence needs of the local communities may impose a variety of significant hardships for individual residents and the community at large.

Lowering the limit would lessen flexibility of the hunters and change the nature of the co-management agreement from a cooperative process to a restriction. This would damage the positive working relationship between NMFS and the communities. Limiting the number of animals to this level of harvest would foster competition between the hunters instead of cooperation. Restricting the harvest to this level may also lead to increased illegal harvest. Restricting the harvest and reducing flexibility of the hunt may increase illegal hunting, cause competition between hunters, and cause economic and dietary hardship in the communities. Thus, this alternative would have a conditional significant adverse indirect effect.

4.3.3 Indirect Effects of the Alternatives on Endangered or Threatened Species

4.3.3.1 Indirect Effects on Steller Sea Lions

The harvest of Steller sea lions may increase under Alternative 2. The elimination of the northern fur seal subsistence harvest would remove the availability of a major subsistence item from the communities. In order to replace the loss, it can be reasonably expected that subsistence pressure on the local population of the threatened Steller sea lion would increase. There are no limits to how many, or restrictions on the timing, location, or methodology of subsistence harvests of Steller sea lions. Because of this, there could be a sizeable harvest of these animals. The elimination of the subsistence harvest of northern fur seals under Alternative 2 could cause a conditionally significant adverse effect on the local population of Steller sea lions.

Alternative 4 sets the subsistence harvest limit to 872 northern fur seals. The potential reduction in harvest of northern fur seals, depending on the year, could cause an increase in subsistence hunting of the threatened Steller sea lion, for the same reasons as stated in Alternative 2. Since there would still be a regular harvest of northern fur seals, the number of Steller sea lions harvested is fewer than in Alternative 1, and there would be a conditionally significant adverse effect on the local population of Steller sea lions.

Because the harvest of northern fur seals in Alternatives 1, 2, and 4 are at low levels (<2,500) benefits from reduction in competition for forage fish would be immeasurable and indirect effects on Steller sea lions would be insignificant.

An indirect effect may occur under Alternative 3- PBR, which has a harvest limit of 16,162 northern fur seals. Removing this many animals from the area may reduce competition between Steller sea lions and northern fur seals for forage fish in the area, thereby benefitting Steller sea lions. Because this is highly speculative, a conditionally significant beneficial effect is given.

4.3.3.2 Other Threatened or Endangered Species

The indirect effects of the alternatives on all other ESA listed species are insignificant. There are no ESA listed species taken as part of these actions either directly or indirectly through harassment or harvest.

4.3.4 Indirect Effects of the Alternatives on Other non-listed Marine Mammals

The “other pinnipeds” group includes the harbor seal and the ice seals (spotted, bearded, ringed, and ribbon seals), and Pacific walrus. Other than harbor seals, the action described in the

alternatives described will have an insignificant effect on other marine mammal species in the action area. There would be no other marine mammal species taken as a result of implementing either of these alternatives either directly or indirectly through harassment or harvest.

Under Alternative 2, the elimination of the northern fur seal subsistence harvest would remove the availability of a major subsistence item from the communities. In order to replace the loss, it can be reasonably expected that subsistence pressure on the local population of the harbor seals would increase. There are no limits to how many, or restrictions of timing, location, or methodology on the subsistence harvest of harbor seals. Because of this, there could be a sizeable take of harbor seals. The elimination of the subsistence harvest of northern fur seals would cause a conditionally significant adverse effect on the local population of harbor seals.

With Alternative 4, he potential reduction in harvest of northern fur seals, depending on the year, could cause an increase in subsistence hunting of the threatened harbor seals, for the same reasons as stated in Alternative 2. Since there would still be a regular harvest of northern fur seals, the number of harbor seals harvested is fewer than in Alternative 1, and there would be a conditionally significant adverse effect on the local population of harbor seals.

Alternatives 1, and 3, would have an insignificant effect on the harvest of harbor seals since subsistence needs would be met through northern fur seals

An indirect effect may occur under Alternative 3- PBR, with harbor seals. Removing this many animals from the area may reduce competition between harbor seals and northern fur seals for forage fish in the area, thereby benefitting harbor seals. Since this is highly speculative, a conditionally significant beneficial effect is given.

4.3.5 Indirect Effects of the Alternatives on Enforcement

Both, enforcement of the alternatives and safety measures taken to implement the preferred alternatives are shared responsibilities between NMFS and the two Tribal Governments as specified in the co-management agreements (see section 4.2.7). Under Alternatives 2 and 4 there would be no harvest, or a reduced harvest. Established traditional subsistence needs would not be met and poaching may occur to fill these needs. Consequently, enforcement may have to address poaching. This would result in a conditionally significant indirect adverse effect for enforcement for Alternatives 2 and 4. With Alternatives 1 and 3 subsistence needs would be met and there would be an insignificant effect on enforcement.

4.4 Summary of Direct and Indirect Effects

Direct and indirect effects are summarized in Table 4.1. For easy comparison Alternatives are plotted against each issue analyzed. The ratings for significance are described in detail in section 4.1.

Table 4.1 Summary of direct and indirect effects.

Category	Alt 1	Alt 2	Alt 3	Alt 4
Harvest Limit	2,500	0	16,162	872
Direct Effects				
Fur Seals	I	I	S-	I
Cultural Values and Co-management	S+	S-	S+	CS-
Steller sea lions (T&E)	I	I	I	I
Threatened and Endangered (others)	I	I	I	I
Other Non-listed Species	I	I	I	I
EFH	I	I	I	I
Enforcement	I	I	I	I
Safety and Health	I	I	I	I
Indirect Effects				
Fur Seals	I	I	CS-	I
Cultural Values and Co-management	S+	S-	U	CS-
Steller sea lions (T&E)	I	CS-	CS+	CS-
Threatened and Endangered (others)	I	I	I	I
Other Non-listed Species	I	CS-	CS+	CS-
EFH	I	I	I	I
Enforcement	I	CS-	I	CS-
Safety and Health	I	I	I	I

S+ Significant beneficial effect
S- Significant adverse effect
CS+ Conditionally significant beneficial effect
CS- Conditionally significant adverse effect
I Insignificant effect
U Unknown effect

4.5 Cumulative Effects

A cumulative effects analysis is a requirement of NEPA. An environmental assessment or environmental impact statement must consider cumulative effects when determining whether an action significantly affects environmental quality. The Council on Environmental Quality (CEQ) guidelines for evaluating cumulative effects state that "…the most devastating environmental effects may result not from the direct effects of a particular action but from the combination of individually minor effects of multiple actions over time." (CEQ 1997).

The CEQ regulations for implementing NEPA define cumulative effects as:

> "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

A cumulative effects analysis takes into account the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). Cumulative effects may result in significant effects even when the Federal action under review is insignificant when considered by itself. The CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action on the universe but to focus on those effects that are truly meaningful. This section analyzes the potential direct and indirect effects of other factors that may in the aggregate, and in combination with the subsistence harvest of fur seals, result in greater effects on northern fur seals or their biological environment than those resulting solely from the subsistence harvest.

The methodology for conducting the cumulative effects analysis in this DEIS is the same as that followed in the Steller Sea Lion Protection Measures Draft Supplemental EIS (NMFS, 2001).

4.5.1 Methodology

The intent of the cumulative effects analysis is to capture the total effects of many actions over time that would be missed by evaluating each action individually. A cumulative effects assessment describes the additive and synergistic result of the actions proposed in this DEIS as they interact with factors external to those proposed actions. To avoid the piecemeal assessment of environmental impacts, cumulative effects were included in the 1978 CEQ regulations, which led to the development of the CEQs cumulative effects handbook (CEQ 1997) and federal agency guidelines based on that handbook (e.g., EPA 1999). Although predictions of direct effects of individual proposed actions tend to be more certain, cumulative effects may have more important consequences over the long term. The possibility of these "hidden" consequences presents a risk to decision makers, because the ultimate ramifications of an individual decision might not be obvious. The goal of identifying potential cumulative effects is to provide for informed decisions that consider the total effects (direct, indirect, and cumulative) of alternative management actions.

The methodology for cumulative effects analysis in this DEIS is taken from the Steller Sea Lion Protection Measures Final SEIS (2001). It consists of the following steps:

- *Identify characteristics and trends within the affected environment that are relevant to assessing cumulative effects of the action alternatives.*

- *Describe the potential direct and indirect effects* - The alternatives reviewed in this DEIS would be similar in their effects on the environment and are treated together. For example, each of the alternatives would have a similar additive effect if considered with the potential effects of habitat loss on fur seals. The effect of the alternatives is largely a null effect or "sum-zero." Therefore, the potential cumulative effect on fur seals is largely the result of the effect of the external activity when considered with the harvest, not the direct or indirect effect of the harvest alternatives themselves.

- *Identify past, present and reasonably foreseeable external factors such as other fisheries, other types of human activities, and natural phenomena that could have additive or synergistic effects* - Past actions must be evaluated to determine whether there are lingering effects that may still result in synergistic or incremental impacts when combined with the proposed action alternatives. The CEQ guidelines require that cumulative effects analysis assess reasonably foreseeable future actions. In these analyses the most significant past action was the commercial harvest; the most significant current actions evaluated were the commercial fisheries (human related) and the changing environment (natural).

- *Evaluate the significance of the potential cumulative effects using criteria established for direct and indirect effects and the relative contribution of the action alternatives to cumulative effects*- Of particular concern are situations where insignificant direct and indirect effects lead to significant cumulative effects or where significant external effects accentuate significant direct and indirect effects. The CEQ guidelines require that cumulative effects analysis assess reasonably foreseeable future actions. In these analyses the most significant past action was the commercial harvest; the most significant current actions evaluated were the commercial fisheries (human related) and the changing environment (natural); and

- *Discuss the reasoning that led to the evaluation of significance, or lack of significance, citing evidence from quantitative information where available.*

The advantages of this approach are that it (1) closely follows CEQ guidance, (2) employs an orderly and explicit procedure, and (3) provides the reader with the information necessary to make an informed and independent judgment concerning the validity of the conclusions. Further this approach was used in the analysis of effects of the groundfish fishery on Steller sea lions in the BSAI at NMFS (2001). In those analyses the cumulative effects of those actions (the fishery) and the environment on the fur seal stock was reviewed in detail. Much of those analyses and text is applicable to the cumulative effects of activities in the BSAI and EBS on northern fur seals. Therefore, the following sections rely heavily on previous analyses in Section 4, NMFS (2001).

4.5.1.1 External Factors and Effects

For the purposes of this DEIS, the definition of other or "external" actions includes both human controlled events such as industrial development, and natural events such as disease, natural mortality or predation, and short and long term climate change.

- *Effects from fisheries* - Direct catch, bycatch, and direct and indirect mortality from fisheries.
- *Effects from commercial hunting and harvesting* - approved commercial marine mammals and subsistence harvests.
- *Effects from Environmental Change* - reduced carrying capacity.

Other external actions may also be significant but need not be examined further to determine significance at this time. These include oil and gas activities, creation of infrastructure (ports and harbors) and commercial shipping effects.

4.5.1.2 Thresholds and Criteria for Determining Significance

The criteria for significance and determinations of cumulative effects significance are the same as those used to analyze the direct and indirect effects of the alternatives on the environment (see Section 4.1).

4.5.2 Direct Cumulative Effects

4.5.2.1 Effects of the Historical Commercial Harvest on Fur Seals

The impacts of the commercial fur seal harvest on the Pribilof Islands have been well documented and are summarized in the conservation plan for the northern fur seal (NMFS 1993) and Chapter 3.6.2 of this DEIS. The commercial harvest reduced the stock by greater than 50 percent leading to a depleted determination under the MMPA in 1988. This designation was the result of the large-scale commercial harvest during this 198-year period and the lack of recovery since its cessation. In 1985 the commercial harvest was terminated and the subsistence harvest by Aleut residents of the Islands was authorized. Historically, the commercial harvest is considered to have a significantly adverse effect.

4.5.2.2 Other Direct Mortality

Intentional killing of northern fur seals by commercial fishers, sport fishers, and others may occur. Such shooting has been illegal since the Marine Mammal Protection Act was passed in 1972. The magnitude of this shooting is unknown.

4.5.2.3 Effects of Other On-land Mortality

Based on limited data, there is no evidence that on-land natural mortality has increased for any year-class, and the levels of mortality reported are too low to have made a significant contribution to the decline in the population since the mid 1970s. In part, this reflects the fact that pup mortality on land is density dependent (York, 1985; Fowler, 1987b). At high population

levels pup mortality is high, and at low population levels pup mortality is low (Fowler, 1985). In the 1940s and 1950s when the population was high, pup mortality on land was 10 to 22 percent. Between 1976 and 1986, annual pup mortality on land decreased from 6-10 percent to 3.7 percent, concurrent with the decline in the total population (based on an analysis of raw data in York and Kozloff, 1987). This density-dependent relationship between pup survival and pup abundance has remained relatively unchanged since the 1940s (Fowler, 1984).

The most common cause of mortality among pups on the Pribilof Islands during the first 2 months of life is emaciation (Keyes et al., 1979). However, the frequency of this and other causes of mortality, such as hookworm disease, tend to be cyclic (Keyes et al., 1979). Of 109 dead pups examined in 1964, 37.6 percent had died of starvation, 17.4 percent from trauma, 12.0 percent from hookworm disease, 4.6 percent *from* gastrointestinal infection, and 11.0 percent *from* miscellaneous infections (Keyes, 1965). Between 1974 and 1977, the primary causes of pup deaths in 725 pups were hookworm (45 percent), starvation (34 percent), microbial infections (14 percent), trauma (3 percent), and miscellaneous (4 percent) (Gentry, 1981). The causes of death *for* approximately 1,025 fur seal pups *from* 1986 to 1991 were emaciation (40 percent), trauma-blunt (18 percent)/trauma-sharp (4 percent), stillborn (8 percent), pneumonia (5 percent), fetal anomalies (1 percent), miscellaneous (18 percent), and undetermined/no gross lesions (6 percent) (Spraker et al.1991).

Pup weight is also an important component of mortality because larger body size may be advantageous to individuals facing their first winter. Baker and Fowler (1992) reviewed studies where juvenile weight was shown to be positively correlated with survival for several mammalian species. With regards to fur seals, these authors found that seal pups who weighed more than their cohort's mean weight had a significantly greater chance of surviving to at least age 2. They concluded that pup weight significantly influences post-weaning survival at sea. Calambokidis and Gentry (1985) also found that pups weighing less than the average pup at birth, or those born to young mothers (< 7 years old), had a greater probability of dying within the first 4 weeks of life when compared to pups of average birth weight from older females.

The information on cumulative effects of natural mortality in early life stages on the fur seal stock is considered equivocal. It is believed to be insignificant, for purposes of the EIS.

4.5.2.4 Direct Effects of Commercial Fisheries

(i) Incidental Mortality due to Fishing

NMFS estimates that the total number of northern fur seals killed incidental to both the foreign and the joint U. S.-foreign commercial groundfish trawl fisheries in the North Pacific from 1978 to 1988 was 246 (95% CI: 68 - 567), resulting in an estimated mean annual rate of 22 northern fur seals (Perez and Loughlin 1991). The foreign high seas driftnet fisheries also incidentally killed large numbers of northern fur seals, with an estimated 5,200 (95% CI: 4,500 - 6,000) animals taken during 1991 (Larntz and Garrott 1993). These estimates were not included in the mortality rate calculation because the fisheries are no longer operative, although some low level of illegal fishing may still be occurring. Commercial net fisheries in international waters of the North Pacific Ocean have decreased significantly in recent years. The assumed level of incidental catch of northern fur seals in those fisheries, though unknown, is thought to be minimal (T. Loughlin, pers. comm., National Marine Fisheries Service).

Six different commercial fisheries in Alaska that could have had direct interactions with northern fur seals were monitored for incidental take by fishery observers during 1990-2001: Bering Sea (and Aleutian Islands) groundfish trawl, longline, and pot fisheries, and Gulf of Alaska groundfish trawl, longline, and pot fisheries. The only observed fishery in which incidental mortality occurred was the Bering Sea and Aleutian Islands groundfish trawl (Table 5), with a mean annual (total) mortality of 1.2 (CV = 3). In 1990 and 1991, observers monitored the Prince William Sound salmon drift gillnet fishery and recorded no mortalities of northern fur seals. In 1990, observers boarded 300 (57.3%) of the 524 vessels that fished in the Prince William Sound salmon drift gillnet fishery, monitoring a total of 3,166 sets, or roughly 4% of the estimated number of sets made by the fleet (Wynne et al. 1991). In 1991, observers boarded 531 (86.9%) of the 611 registered vessels and monitored a total of 5,875 sets, or roughly 5% of the estimated sets made by the fleet (Wynne et al. 1992). During 1990, observers also boarded 59 (38.3%) of the 154 vessels participating in the Alaska Peninsula/Aleutian Islands salmon drift gillnet fishery, monitoring a total of 373 sets, or roughly 4% of the estimated number of sets made by the fleet (Wynne et al. 1991). Although no interaction with northern fur seals was recorded by observers in 1990 and 1991 in these fisheries, due in part to the low level of observer coverage, mortalities did occur as recorded in fisher self-reports.

An additional source of information on the number of northern fur seals killed or injured incidental to commercial fishery operations is the self-reported fisheries information required of vessel operators by the MMPA. During the period between 1990 and 1999, fisher self-reports from three unobserved fisheries resulted in an annual mean of 14.5 mortalities from interactions with commercial fishing gear. While logbook records (fisher self-reports required during 1990-94) are most likely negatively biased (Credle et al. 1994), the biases in these estimates are hard to quantify because at least in one area (Prince William Sound), it is unlikely that fur seals occur and reports of fur seal-fishery interactions are likely the result of species misidentification. The great majority of the incidental take in fisher self-reports occurred in the Bristol Bay salmon drift net fishery. In 1990, self-reports from the Bristol Bay set and drift gillnet fisheries were combined. As a result, some of the northern fur seal mortalities reported in 1990 may have occurred in the set net fishery. Logbook data are available for part of 1989-1994, after which incidental mortality reporting requirements were modified. Under the new system, logbooks are no longer required; instead, fishers provide self-reports. Data for the 1994-95 phase-in period is fragmentary. After 1995, the level of reporting dropped dramatically, such that the records are considered incomplete and estimates of mortality based on them represent minimums.

No observers have been assigned to several of the gillnet fisheries that are known to interact with this stock, making the estimated mortality unreliable. However, the large stock size makes it unlikely that unreported mortalities from those fisheries would be a significant source of mortality for the stock. The estimated minimum annual mortality rate incidental to commercial fisheries is 17 fur seals per year based on observer data (1.2), and self-reported fisheries information (16) where observer data were not available.

In summary, observer records from 1990 to 1999 indicate that direct interactions with groundfish vessels occurred only in the BSAI trawl fishery, despite observer placement in pot, longline and trawl fisheries in both the BSAI and GOA. In the BSAI trawl fishery, the average annual take rate (1994 to 1998) was 1.4. This level of take contributes little to the northern fur seal potential biological take (PBR) of 16,162 (Angliss and Lodge 2003) and is inconsequential to population trends. It is therefore considered insignificant for purposes of this analyses.

(ii) Effects of Entanglement in Fishing Gear

Northern fur seal entanglement in marine debris is more common than for any other species of marine mammal in Alaskan waters (Laist, 1987, 1997; Fowler, 1987a). Mortality resulting from entanglement in marine debris has been implicated as a contributing factor in the decline observed in the northern fur seal population on the Pribilof Islands during the 1970s and early 1980s (Fowler 1987a, Swartzman et al. 1990).

Surveys conducted from 1995 to 1997 on St. Paul Island indicate a rate of entanglement among subadult males comparable to the 0.2% rate observed from 1988 to 1992 (Fowler and Ragen 1990, Fowler et al. 1994), which is lower than the rate of entanglement (0.4%) observed during 1976-85 (Fowler et al. 1994). During 1995-97, NMFS researchers in conjunction with members of the Aleut communities of St. Paul and St. George Islands captured and removed entangling debris (including trawl net, packing bands, twine, and miscellaneous items) from 88, 146 and 87 northern fur seals, respectively.

Laist (1997) suggested that modest signs of northern fur seal population recovery in recent years may be an indication that entanglement in net debris is among the factors impeding population recovery. The contribution of intentional discard of net debris from Alaskan groundfish fisheries vessels is thought to have declined over the past decade. However, consistent numbers of seals entangled in packing bands on St. Paul Island may reflect disposal of these materials in proximity to the islands. Recent data from satellite-tracked drifters deployed in the Bering Sea suggest a "trapped" circulation pattern around the Pribilof Islands (Stabeno *et al.,* 1999) which may retain marine debris in the nearshore environment.

Therefore, the effect of entanglement in discarded debris has been a potentially significant factor in the past. At this time, it is still occurring, but the effect of this on fur seal stock status is considered insignificant at this time.

4.5.2.5 Effects of Diseases and Parasites

The effects of diseases and parasites on fur seals between the late 1970s and the late 1980s were unknown. Necropsies of juvenile seals taken in the St. Paul Island subsistence harvest during the 1980s suggest that the population is relatively disease free compared to the period from the 1950s to early 1970s (NMML unpublished data). For example, mortality from ascarid (nematode worm) infection may have been important during the 1950s and 1960s (Neiland, 1961; Keyes, 1965), and while Leptospirosis was not identified until the 1970s (Smith et al. 1977). However, the relative importance of this form of natural mortality in the decline of the Pribilof Islands stock is unknown. Although natural conditions in the environment such as disease (and predation) have not been a significant threat to the fur seals in the past, disease should be considered a constant threat given the densities of fur seals (and their potential vulnerability to a disease) during the breeding season.

Any significant declines due to disease factors should have been detected given the annual screening that occurs as part of the research program on St. Paul Island. Given the information available, the cumulative effect of disease on the fur seal status, mortality is considered to be insignificant.

4.5.2.6 Effects of Predation

Captain Charles Bryant, first special agent of the Treasury Department, arrived on the Pribilofs in 1869 and stated that he took, respectively, 18 and 24 seal pups from the stomachs of two killer whales (original account chronicled by Lucas (1899) and reported in Scheffer et al. 1984). However, it has been since suggested that the record may have been incorrectly reported as being from the Pribilof area (Scheffer et al., 1984). The only authenticated stomach examination of a killer whale on the Pribilofs occurred in 1868 when a killer whale was seen "swimming with such force that he ran aground and was unable to get off. When the tides went out the whale was cut open and three seals were found in its stomach" (original record reported in Scheffer et al. 1984).

Preble and McAtee (1923) (as reported in Scheffer et al. 1984) gave numerous records of killer whales seen from 1875 to 1917. One killer whale seen off Reef rookery on December 2, 1902, "was playing havoc with a band of seals." At Northeast Point on November 6, 1904, "fragments of both cows and pups, the work of killer whales, were found strewn along the beach."

Killer whales have also been observed to attack fur seals near Robben Island (Bychkov 1967), but no information is available for the Pribilof Islands in recent years. The account by Scheffer et al. (1984) concluded by stating that "evidence of predation by killer whales upon seals has not, we believe, been reported since 1917. We [Scheffer et al. 1984] conclude that killer whales have not changed their habits, but that Pribilof residents now spend less time watching the beaches than they used to." It is not known to what extent killer whales prey upon fur seals in waters adjacent to the Pribilof Islands.

Other sources of mortality to pups are predation by foxes and Steller sea lions. On three occasions, foxes have been seen attacking living pups (reported in Roppel, 1984). Steller sea lions have also been reported to kill weaned fur seal pups close to shore on St. George Island (Gentry and Johnson, 1981) but, generally, at rates considered too low (3.4-6.8 percent of neonates) to be considered significant to the decline of the Pribilof Island stock of fur seals. Mortality of fur seal pups by sea lions was also observed in 1992. However, in general, the effects of predation on the decline and recovery of fur seals are not considered to have had, nor are they considered having presently, a major impact on the stock (Fowler, 1985).

Given information available and recent changes in pinniped populations in the Bering Sea, and the effects of those changes on killer whale predation, the effects of predation on fur seals is unknown at this time.

4.5.2.7 Effects from Research

Impacts of research activities involving northern fur seals are limited primarily to disturbance of animals incidental to the collection of data and samples regarding population status and trends, and investigations of forage ecology and movement patterns during the summer breeding season. The majority of incidental disturbance is associated with annual counts of adult males and biennial estimates of pup production. Adult male counts require movement through the seal rookeries and haulouts by biologists making observations from established locations to obtain the necessary counts of male seals by breeding category. The biennial pup census is a mark and release activity which requires a number of pups to be rounded up on their natal rookeries, temporarily detained, and marked by shearing a small area of fur from the head of each pup.

The pups are released back onto the rookery and after a number of days, biologists return to observe the ratio of marked to unmarked pups in the population.

These counts are conducted in an established manner designed by decades of practical experience to minimize the level of disturbance and resultant impacts on the animals involved. Whenever possible, multiple research activities are combined into a single action to reduce the frequency and variety of disturbance. The pup counts are conducted on a biennial basis and unless research needs require otherwise, occur on an alternating sub-sample of rookeries to further reduce the frequency of disturbing any given area.

Special catwalk and tripod structures are constructed and regularly maintained at considerable expense to provide direct and non-disruptive observation platforms for research purposes. Researchers using these structures are specifically trained and experienced in approaching the rookery/haulout areas and using the structures in a manner which reduces the disturbance to the animals.

A secondary level of disturbance is associated with the foraging ecology studies, which require individual animals to be physically captured, restrained and fitted with a satellite transmitter tag and then released. This activity is conducted onsite so that the animal does not have to be transported and extreme caution and patience is applied to the entire procedure. It is not uncommon for researchers to spend many hours if not days waiting for the right conditions and circumstances to carry out the procedure in the proper manner or to abort a procedure that has any significant potential to cause adverse impact on the individual subject animal or to those in close proximity thereof.

Research activities are conducted under official federal permits as required by the MMPA and summary reports are published by the permit holder for review by the permit office of the NMFS. In 1996 there were 5 mortalities (4 pups and 1 juvenile male) and in 1997 there was one mortality (juvenile male). From 1998-2002, there were 2 mortalities (one pup in 1999 and one pup in 2000), which were attributed to smothering after the pups became trapped between rocks while under other pups. The juvenile males were entangled animals and were compromised by severe wounds. One died during handling, the other after it was released.

Future research actions are expected to have relatively few mortalities. Research is dependent upon funding but, at a minimum, annual counts of adult males and biennial estimates of pup production will be conducted. The present operating permit (# 782-1708), is extensive in the breadth of research activities that could be conducted. It is difficult to predict mortalities, but all possible precautionary measures are taken, and mortalities are rare. The permit for 1998-2002 allowed annual accidental mortality of 10 pups and 2 non-pups. The 2003-2007 permit allows an annual accidental mortality of 10 pups and 4 non-pups.

The effects from research activities are insignificant.

4.5.2.8 Effects from Other Factors

This analysis also considered the cumulative impact to the northern fur seal from fish processing, fuel transfers and oil spills, tourism, harbor development, construction, and waste discharges. Fish processing occurs on both St. Paul and St. George Islands. Discharges from certain processing technology could impact seals. However, the Environmental Protection

Agency regulates such discharges and it is unlikely they would authorize harmful practices. NMFS would remain a strong advocate for protection of fur seals in providing recommendations to EPA regarding marine discharges here. Harbor development has occurred on both islands, and St. Paul's harbor is currently being expanded. Fur seal pups have begun using the waters within the harbor at St. Paul, predisposing them to the effects of vessel traffic and fuel spills. The harbor at St. George is proximate to the Zapadni Bay rookery. At this time, however, NMFS has not found any measurable adverse effects on fur seals from harbor activity. Fuel barges are present in nearshore waters off the Pribilofs, both for supply on-island and to support the offshore fishing fleet. The associated spill potential from these barges is considered moderate. No such events have occurred, but vessel groundings are not uncommon on the Pribilofs, and many fisheries occur during seasons which have extreme weather and sea conditions. Most fishing seasons for crab and pollock occur during periods when fur seals are not present on the Pribilof Islands. However, should a petroleum product spill occur during times when the islands are occupied by fur seals, or if a spill would persist into the breeding and pupping season, it could cause injury and mortality within the population.

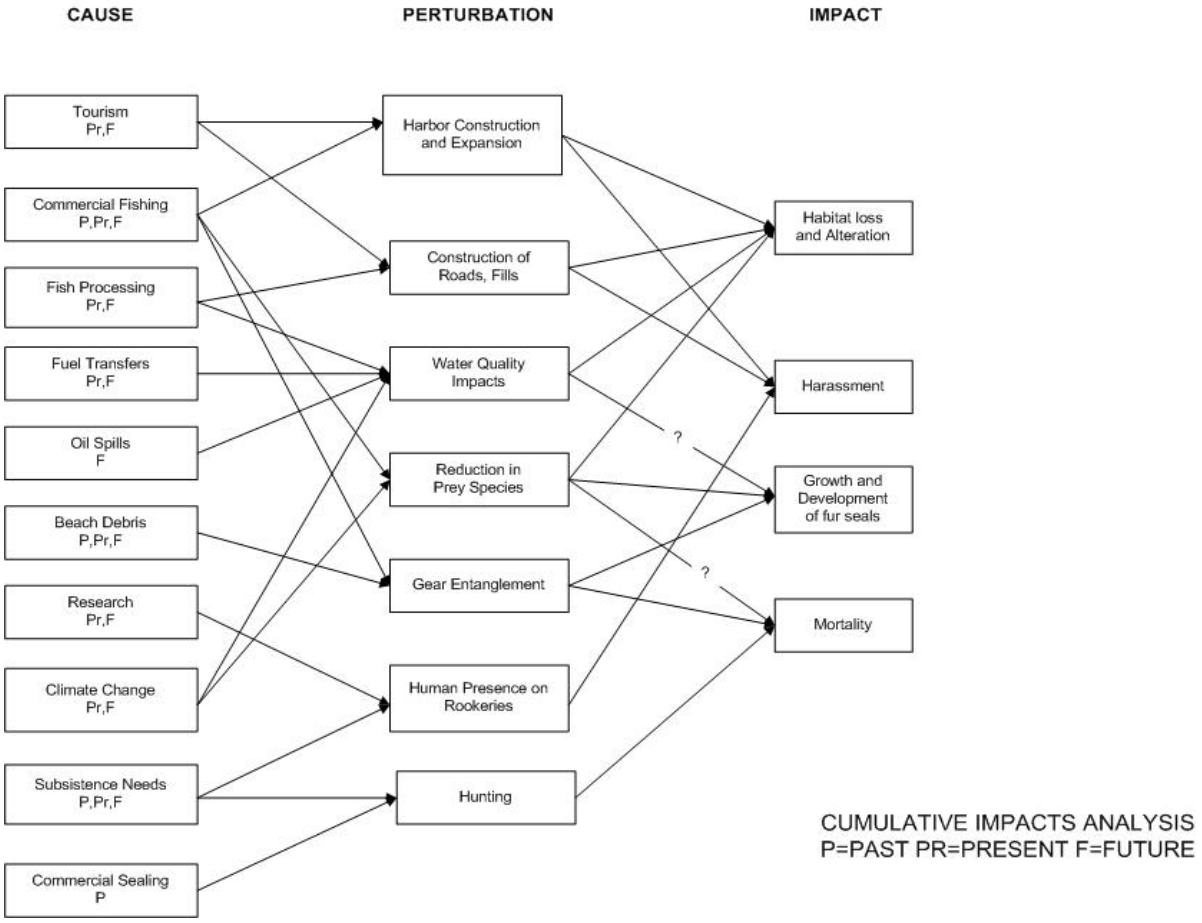
The past and current levels of tourism on the Pribilofs have been low. Future expansion of the tourism industry in probable, and several eco-tourism cruise ships have begun to visit these islands. NMFS and co-managers on St. Paul and St. George are responsible for protecting important fur seal habitats from disturbance and harassment from tourism; maintaining signs and viewing platforms at safe distances. No significant cumulative impacts from tourism are anticipated.

4.5.3 Indirect Cumulative Effects

4.5.3.1 Indirect Cumulative Effects of Fishing on Fur Seals

Competition between fisheries, marine mammals, and seabirds has a long history and has been described from different perspectives. On one hand, fishermen have observed the numbers of target species that have been consumed by marine mammals and seabirds and treated the mammals and birds as economic competitors for their catch (Furness 1984). On the other hand, biologists and conservationists have observed the large amount of biomass that is removed from marine ecosystems by fisheries and have been concerned that fisheries compete with marine mammal and seabird populations. It has been demonstrated (NMFS 2001) that an overlap between fur seal diets and foraging areas, and commercial catch of groundfish in the BSAI exists. This overlap between fishermen and fur seals suggests that these two consumers actively demand a common resource and may, as a result, be competitors for that resource.

Figure 4.2 depicts the cumulative effects analysis used in this assessment



(i) Potential Effects of Commercial Fishing on Disturbance to Northern Fur Seals

Disturbance from either vessel traffic or fishing activities may also be a disadvantage to marine mammals, particularly foraging animals. Vessel traffic alone may temporarily cause fish to compress into tighter, deeper schools (Freon et al. 1992) or split schools into smaller concentrations (Laevastu and Favorite 1988). However, disturbance effects on northern fur seal prey are difficult to identify. The potential for disturbance effects caused by vessel traffic, fishing gear, or noise appears limited for northern fur seals. Kajimura (in Johnson *et al.,* 1989) reported no response by fur seals when approached by ship, and NMFS observers on board Japanese driftnet vessels regularly reported fur seals in close proximity to both the gear and fishing vessels (International North Pacific Fisheries Commission [INPFC] reports from the 1980s). Interactions with other types of fishing gear, such as trawl nets, also appear limited based on the rare incidence of takes in groundfish fisheries. Overall, disturbance effects are considered incidental.

(ii) Potential Ecological Interactions Between Northern Fur Seals and Commercial Fisheries

Ecological interactions between marine mammals and commercial fisheries are, in most cases, difficult to identify. Examples of observable interactions are generally restricted to direct mortality in fishing gear. Even then, the ecological significance of the interaction is related to the number of animals killed and subsequent population level responses. No marine mammal incidental mortality estimates for Alaskan groundfish fisheries exceed the PBRs (Hill and DeMaster 1999); therefore, those interactions are not expected to have large ecosystem consequences.

More difficult to identify and potentially more serious are interactions resulting indirectly from competition for resources that represent both marine mammal prey and commercial fisheries targets. Such interactions may limit foraging success through localized depletion, disaggregation of prey, or disturbance of the predator itself. Compounding the problem of identifying competitive interactions is the fact that biological effects of fisheries may be indistinguishable from changes in community structure or prey availability that might occur naturally. The relative impact of fisheries perturbations, compared to broad, regional events such as climatic shifts, are uncertain, but given the potential importance of localized prey availability for foraging marine mammals, they warrant close consideration.

Lowry (1982) developed qualitative criteria for determining the likelihood and severity of biological interactions between fisheries and marine mammal species in the Bering Sea. His criteria were based on marine mammal diet, focusing on species consumed, prey size composition, feeding strategy, and the importance of the Bering Sea as a foraging area.

As with other apex predators such as Steller sea lions, ecological interactions between northern fur seals and the groundfish fisheries may be caused by spatial and temporal overlap between fur seal foraging areas and groundfish fisheries and from competition for target and bycatch species taken by the fisheries. Therefore, a potential mechanism by which fur seals may be disadvantaged by competition with commercial fisheries for food resources is through competition or localized depletion of prey. Whereas the overall abundance of prey across the entire Bering Sea may not be affected by fishing activity, reduction in local abundance, or dispersion of schools could be more energetically costly to foraging marine mammals. Thus,

the timing and location of fisheries, relative to foraging patterns of northern fur seals may be a more relevant management concern than total removals. Such a case for concern over possible localized depletion has been identified for Steller sea lions and the groundfish fisheries in the BSAI and GOA for walleye pollock, Pacific cod and Atka mackerel. The diet of northern fur seals includes a wide range of fish species, with less apparent dependence on Pacific cod and Atka mackerel compared to Steller sea lions. However, both adult and juvenile pollock occur in the diet of northern fur seals and consumption rates vary according to the abundance of different age classes of pollock in the foraging environment (Swartzman and Haar, 1983; Sinclair *et al.,* 1996). Evaluation of the indirect effects of fisheries on northern fur seals, stemming from the various alternatives, therefore, focuses less on removals of Pacific cod and Atka mackerel and more broadly on removals of pollock and small schooling fishes.

Northern fur seals forage at shallow to mid-water depths of 0 to 820 ft (0-250 m), both near shore and in pelagic regions of their migratory range. Female and young male fur seals generally consume juvenile and small-sized (2 to 8 inch) schooling fishes and squids although diet varies across oceanographic subregions along their migration routes and around breeding locations in the Pribilof Islands. In the eastern Bering Sea, primary prey species include pollock and Pacific cod, but deep sea smelts, lanternfish, and squids are also major components. Recent studies based on scat analysis have indicated that the pollock and Pacific cod consumed by fur seals tend to be smaller than those selected by the target fisheries, however data from stomach collections from the 1960s through the 1980s indicate that fur seals often consume adult pollock. Recent studies used bio-chemical methods to study the diet of northern fur seals suggests that the diet of deep diving fur seals in waters over the continental shelf includes adult pollock (Kurle and Worthy, 2000). Thus, the most relevant indirect effects of the alternatives on northern fur seals are likely to be those that either increase or decrease the abundance or distribution of smaller schooling fishes and squid, or shift the overall pattern of pollock and Pacific cod harvest in a manner that changes the harvest rate of fur seal prey.

4.5.3.2 Potential Indirect Effects of the Environment on Fur Seals in the BSAI

(i) Regime Shift Hypothesis

The North Pacific Ocean is dominated in the winter by an atmospheric phenomenon called the Aleutian Low. The Aleutian Low is a semi-permanent low pressure area that develops late in the year, dominates the winter, and begins to break down during the spring to be replaced by an extensive high pressure system during the summer (Beamish 1993). It can produce changes in atmospheric temperature, storm tracks, ice cover, and wind direction in the BSAI, and GOA (Wyllie-Echeverria and Wooster 1998). Short-term El Niño Southern Oscillation events intensify the Aleutian Low Pressure cell, which enhances wind forcing and precipitation in the North Pacific. This increases the advection of warm water into the northern region of the North Pacific Ocean, increases sea surface temperatures in the BSAI, and GOA, and can trigger a series of oceanographic events that increase ocean productivity. These events cause the marine ecosystems of the BSAI, and Gulf of Alaska to oscillate between "warm" climatic regimes and "cold" climatic regimes (Ebbesmeyer et al. 1991, Brodeur and Ware 1992, Beamish 1993, Francis and Hare 1994, Miller et al. 1994, Trenberth and Hurrell 1994; Ingraham et al. 1998).

In 1940-1941 an intense Aleutian Low was observed over the BSAI, this was followed recently from December 1976 to May 1977 with an even more intense Aleutian Low. During this latter period, most of the North Pacific Ocean was dominated by this low pressure system which signaled a change in the climatic regime of the BSAI. The system shifted from a "cold" regime

to a "warm" regime that persisted for several years. Since 1983, the GOA and Bering Sea have undergone different temperature changes. Sea surface temperatures in the Bering Sea were below normal. Recent evidence now indicates that another regime shift occurred in the North Pacific in 1989.

(ii) Impacts on Biological Productivity and Animal Populations

Most scientists agree that the 1976/77 regime shift dramatically changed environmental conditions in the BSAI. However, there is considerable disagreement on how and to what degree these environmental factors may have affected both fish and marine mammal populations. Productivity of the Bering Sea was high from 1947 to 1976, reached a peak in 1966, and declined from 1966 to 1997. Some authors suggest that the regime shift changed the composition of the fish community and reduced the overall biomass of fish by about 50 percent (Merrick et al. 1995, Piatt and Anderson 1996). Other authors suggest that the regime shift favored some species over others, in part because of a few years of very large recruitment and overall increased biomass (Beamish 1993, Hollowed and Wooster 1995, Wespestad et al. 1997, Wyllie-Echeverria and Wooster 1998).

(iii) Impacts on Fur Seal Foraging Habitat

More information is available on fur seals and Steller sea lions than any other marine mammal species in the area. Therefore, a discussion on the impacts of climate variability and regime shifts on the forage species necessarily focuses on these two species.

One hypothesis is that during regime shifts, certain species flourish, such as walleye pollock and Pacific cod, at the expense of other prey species (i.e., forage fishes). NMFS believes that the situation is much more complicated than this.

However, from 1970 to 1980, the annual groundfish catch in the BSAI and GOA ranged from 1.3 to 2.3 million mt, very close to the current catch levels and catches of pollock spawned before the regime shift were high. For example, in the GOA, the catch-per-unit-effort of walleye pollock increased by 6 times from 1961 to 1973-1976. The greatest increases (about 17 times) were observed in Prince William Sound and around Kodiak Island. Walleye pollock comprised the majority of groundfish catches in the BSAI and GOA for almost a decade before the regime shift and the pollock biomass had been fairly substantial.

While biomass was high before the regime shift, it is also reasonable to conclude that the 1976-1977 regime shift produced some very large year-classes of gadids (walleye pollock and Pacific cod). At the same time, the regime shift produced large year classes of other groups, including salmonids (Pacific salmon), clupeids (Pacific herring), scorpaenids (sablefish, Pacific ocean perch, and other rockfish), anoplomatidae (sablefish), and pleuronectids (Pacific halibut) among others (see Beamish 1993). The effects of the regime shift on the productivity of marine species was not limited to the BSAI and GOA. Large year classes were produced as far south as California (Beamish 1993).

Many competing factors have contributed to the ecosystem in which many components of the fur seal population now depend. However, the important question here is whether the diet, or some other habitat need, of fur seals was adversely affected by the regime shift. Fur seals have not demonstrated steep declines due to regime shifts and their history is confounded with a significant commercial harvest which affected their numbers. The current decline of

approximately 4%, however, may be a result of a change in carrying capacity or a fisheries-influenced effect, or both in combination with other factors.

(iv) Possible Changes in the Carrying Capacity of the BSAI

Populations can experience abrupt and dramatic declines because of dramatic reductions in environmental carrying capacity (Odum 1971). Such a reduction could explain the decline of top predators in the BSAI and GOA. One hypothesis argues that the regime shift favored gadids which decreased the quality of the natural environment for pinnipeds and some seabirds, due to the lower energy content compared to herring and capelin that theoretically dominated the pelagic community during the "cold" regimes. The regime shift produced environmental conditions that increased the abundance of walleye pollock, Atka mackerel, Pacific cod and various flatfish species (Beamish 1993). After reconstructing the strength of different pollock year-classes, Beamish (1993) concluded that the 1978 year-class of walleye pollock was the strongest on record and dominated the commercial pollock catch in the 1980s. At the same time, small forage fish like capelin, eulachon, and Pacific sandlance declined in bays and the nearshore waters of the BSAI and western and central GOA (Anderson and Piatt 1996).

Other investigators suggest the regime shift caused the entire structure and composition of the invertebrate and fish communities of the region to change (Brodeur and Ware 1992, Beamish 1993, Francis and Hare 1994, Miller *et al.* 1994, Hollowed and Wooster 1992; 1995; Wyllie-Echeverria and Wooster 1998).

Conversely, the other side of this debate accepts that the climatic regime shifted in the mid-1970s and that the regime shift produced large year-classes of groundfish in 1976-1977 (NMFS 1998). This would not necessarily reduce the carrying capacity of the system for pinnipeds, such as Steller sea lions, northern fur seals, harbor seals, kittiwakes, or murres. In fact, it could possibly increase the carrying capacity. In summary, there is considerable disagreement about the effect of these oscillations on the carrying capacity (K) of the North Pacific. Perhaps the carrying capacity was increased for some species and decreased for others, or that the entire K was either decreased or increased. At this point, the best available scientific and commercial data are equivocal.

All animal populations fluctuate over time, sometimes in response to changes in their physical environment, sometimes in response to changes in their ecological relationships (predator-prey dynamics), and sometimes in response to combinations of the two. Large, natural variability often masks the effects of human activity on natural ecosystems and populations. Because of the complex relationships between wild populations, their physical environment, and their ecological relationships, it is extremely difficult to assign a populations' decline to a single cause.

(v) Effects of Carrying Capacity (K) on Fur Seals: Few efforts have been made to assess whether the fur seal carrying capacity of the Bering Sea and eastern North Pacific ecosystem has changed. Northern fur seals were possibly near their carrying capacity between 1940 and 1956 when peak numbers of animals were seen on the Pribilof Islands. However, significant changes have taken place in the abundance and size/age-structure of fish, shellfish, seabird, and marine mammal populations (cf., Bailey et al., 1986; Bakkala et al., 1986, 1987; Springer et al., 1986; Merrick et al., 1987; Nunnallee and Williamson, 1989; Bakkala, 1989; Loughlin and Merrick, 1989; Lowry et al., 1989; Pitcher, 1990). Swartzman and Haar (1983) reviewed fisheries data for the Bering Sea (primarily on walleye pollock, Theragra

chalcogramma) as it relates to carrying capacity. While their work suggests that the data are more consistent with the hypothesis that the carrying capacity has increased since the early 1970s, they "did not reject the hypothesis that the fur seal carrying capacity was reduced by fisheries." Therefore, data concerning the effects of removing fish from the Bering Sea and Gulf of Alaska on marine mammals is equivocal. The impact of commercial fishing on the ecology of fur seals and community competition is poorly understood.

Changes in environmental and oceanographic features may also influence mortality rates of fur seals and other pinnipeds, and thus influence carrying capacity. In 1950, severe storms and low temperatures were possibly responsible for an estimated 700 deaths of fur seals that were stranded in Oregon and Washington (Scheffer, 1950). York (1991) found a significant positive correlation between sea surface temperatures (SST) off British Columbia and early survival of male fur seals 4 months to 2 years old. She hypothesized that SST may influence Pacific herring abundance and availability (herring is a common fur seal prey in winter and spring), thus affecting early survival of fur seals. Studies in Alaska suggest that a 1982-1983 El Nino event probably did not have an important effect on fur seals (Gentry, 1991) or some seabirds (Hatch, 1987) in that region. The same EI Nino event had a significant impact (i.e., pup production declined significantly) on the 1983 breeding season of fur seals on San Miguel Island, California (the southern extent of their North Pacific range) (DeLong and Antonelis, 1991), emphasizing the potential influence of environmental or oceanographic changes on fur seal abundance and pup production.

Therefore, a reliable measurement of the current carrying capacity for fur seals is not available, based on existing ecosystem conditions. Fowler (1986) stated that "given the available data and analyses, it is not possible to clearly determine whether the Pribilof fur seal population is currently at, above, or below carrying capacity levels; whether carrying capacity has changed significantly in the last two or three decades; or whether the observed population decline is due to declining carrying capacity, increased mortality, or some combination of both." However, it is clear, given the extreme reduction in the western population of Steller sea lions, that the environmental carrying capacity has somehow been reduced for that species and, therefore, has likely been reduced for fur seals as well. Current population trends for fur seals mimic the decline of sea lions in this area and therefore one questions whether carrying capacity for fur seals in the Bering Sea has also been diminished in recent decades.

4.5.4 Summary of Cumulative Impacts

This section summarizes the direct and indirect cumulative effects (from Chapter 4.3) on northern fur seals throughout their range.

4.5.4.1 Direct Cumulative Effects

Potential Effects from the Commercial Harvest of Fur Seals: The commercial harvest of fur seals was a major source of human-induced mortality for more than 200 years, and the abundance of fur seals has fluctuated greatly in the past, largely due to this commercial harvest (NMFS 1993). There has been an historic significant adverse effect from commercial harvest of northern fur seals. Commercial harvest of fur seals peaked during 1961 with more than 126,000 animals harvested, and the commercial harvest of fur seals ended in 1985 (NMFS 1993). Residual effects of past commercial harvests on the fur seal population are possible, but recent population declines have overshadowed any potential lingering residual effects. The northern fur

seal was designated as a depleted stock under the Marine Mammal Protection Act (MMPA) in 1988. The reason for the designation was the steep decline in numbers (NMFS 1993). It is doubtful now whether the trends in fur seals can be attributed to the residual effects of the commercial harvest.

Direct Effects of Commercial Fishing on Northern Fur Seals

Past external effects on northern fur seals due to incidental mortality in fisheries have been considerable and have contributed to population declines, especially from foreign fisheries. Present and predicted external effects include mortality sources while these animals are outside the EEZ and small levels of take in State-managed gillnet fisheries. Generally, however, the incidental take of northern fur seals is uncommon in the groundfish fisheries. The last recorded mortality in any Alaskan groundfish fishery occurred in 1996, when the take rate was one animal per 1,862,573 mt of groundfish harvested. This level of take contributes little to the northern fur seal PBR of 16,162 (Angliss and Lodge 2003) and is inconsequential to population trends. There is an insignificant effect from incidental take of northern fur seals from commercial fishing.

Entanglement in marine debris is more common in fur seals than any other species of marine mammal in Alaskan waters (Laist, 1987, 1997; Fowler, 1988). Mortality of northern fur seals from entanglement in marine debris contributed significantly toward declining trends in the Pribilof Islands during mid to late 1970s and early 1980s (Fowler, 1988). The contribution of the groundfish fishery is thought to be less than in previous years and, at this time, is considered insignificant (NMFS 2001).

The potential for disturbance effects caused by vessel traffic, fishing vessels or gear, and noise appears limited for northern fur seals. Interactions with other types of fishing gear, such as trawl nets, also appear limited based on the rare incidence of takes in groundfish fisheries. Disturbance effects on northern fur seal prey are difficult to identify. Thus, a cumulative effect might be identified for disturbance but lacking information on the actual effect of disturbance, the cumulative effects were also considered unknown.

4.5.4.2 Indirect Cumulative Effects

Effects of Fishing on Prey Availability: Northern fur seals are apex predators much like Steller Sea lions and as such, ecological interaction between northern fur seals and the groundfish fisheries are caused by the spatial and temporal overlap between fur seal foraging areas and groundfish fisheries and from competition for target and bycatch species. Additional information on the life history and ecology of the northern fur seal is presented in Section 3 of NMFS (2001).

Fisheries regulations implemented in 1994 (50 CFR 679.22(a)(6)) created a Pribilof Islands Area Habitat Conservation Zone, in part to protect northern fur seals. Trawl closures around the Pribilof Islands, established mainly for the protection of crab stocks, may offer positive benefits for fur seals by limiting prey removals in waters surrounding the Pribilof Island rookeries. However, only northern fur seals that forage close to the islands would benefit by the availability of prey and recent tracking studies show that foraging trips of both adult female and juvenile male fur seals extend well beyond the trawl closure boundaries. Partitioning of foraging habitat by lactating fur seals on the Pribilof Islands indicates that the Pribilof Islands Area Habitat Conservation Zone would primarily benefit females from northwest St. Paul Island

and provide less protection to the foraging habitat of females from southwest St. Paul Island or St. George Island.

Effects on Prey Abundance: Since groundfish fisheries do harvest prey of northern fur seals (i.e., pollock and Pacific cod), competition due to the harvest rates of those species may vary depending on several factors. The potential competitive overlap between fisheries for Pacific cod and pollock and northern fur seals is influenced by several factors determining whether removals are concentrated in space or time:

- competition may vary depending on the availability of smaller prey in foraging areas.
- 45% of the catch from both fisheries occurs during the A Season in winter when female and juvenile male fur seals are not commonly found in the areas used by fisheries.

- fishery harvest rates during summer on adult pollock and Pacific cod in areas used by fur seals are below the annual target rates for the fish stocks as a whole (NMFS, 2000c).

- pollock fishery in the Bering Sea (summer season) begins on September 1, late into the fur seal breeding season (June-October).

- Fisheries for pollock do not target fish younger than 3 years of age, the preferred size by foraging fur seal (Ianelli et al., 1999; Dorn et al., 1999). The overall catch of pollock smaller than 30 cm is small, and thought to be only 1 to 4 percent of the number of one- and two-year olds each year in the eastern Bering Sea and GOA (Fritz, 1996).

While these factors lower the probability of adverse impacts stemming from spatial or temporal concentration of fisheries in northern fur seal foraging areas, changes in harvesting activity and/or concentration of harvesting activity in space and time may differentially impact fur seal foraging habitat at both the population and sub-population level. Given the uncertainty in the degree to which fur seals compete with the fishery for adult pollock in fur seal foraging areas where spatial and temporal overlap has been identified, it is assumed that conditionally significant adverse effects could occur (NMFS 2001).

The harvest of prey is considered to have cumulative impacts based on the potential overlap between fisheries and fur seal foraging habitat and based on uncertainty as to the effect of harvest on fur seal populations. This cumulative effect is considered conditionally significant adverse (NMFS 2001). Further, given the uncertainty of the effect of increased fishing in fur seal habitat during June-August (NMFS 2003), the effects of fishing were rated as conditionally significant adverse.

Catches of squid and small schooling fish in the groundfish fisheries of the BSAI and GOA are very low and are not expected to affect fur seal populations.

Potential Cumulative Effects of Regime or Environmental Changes on the Northern Fur Seal: The present and predicted external effects of the environment on northern fur seals and their prey associated with climate change or regime shifts are likely based on the seals' wide distribution in the BSAI and EBS which would make them susceptible to large-scale regional changes in climate. Given recent declining trends in fur seal abundance, these effects are considered conditionally significant adverse.

Therefore, the direct and indirect cumulative effects on fur seals as a result of other activities are rated as conditionally significant adverse. These include the potential negative effects of the environmental shifts that might affect prey or the carrying capacity of fur seals, and the effects of commercial fishing on availability of fur seal prey based primarily on the spatial and temporal overlap of the groundfish fisheries with fur seal foraging ranges, significant increases in prey removal around St. George Island, and on the lack of information from the groundfish fisheries that food availability is not related to recent population declines.

Table 4.2 is taken from the Steller Sea Lion Protection Measures Final SEIS (NMFS 2001) as it is applicable to this action.

Table 4.2 Direct and Indirect Effects on Fur Seals Taking into Account Incremental or Cumulative Impacts of Other Activities (NMFS 2001).	
Activity	**Description of Effect on Fur Seal Stock or Habitat**
DIRECT	
Commercial Fur Seal Harvest	**S- Historically Significant Adverse**
On-land Natural Mortality (pup mortality at rookery)	**I**
Incidental Take in Fisheries	**I**
Disturbance due to Fishing	**I**
Entanglement in Debris	**I Historically has been high but at present is considered insignificant**
Disease and Parasites	**I**
Predation	**U Relationship to predation by killer whales is unknown**
Research	**I**
Other Factors	**I**
INDIRECT	
Harvest of Fur Seal Prey and prey availability to fur seals	**CS- Commercial fisheries target pollock a principal prey of fur seals**
Spatial/Temporal Effects of Fishing-localized Effects	**CS-/S- Overlap between commercial fishing and foraging areas of fur seals has increased substantially around St. George**
Environmental Effects	
Impacts of Environmental Shifts on Foraging Habitat	**CS- Fur Seal Stock is in decline and its relationship to recent environmental regime shifts is considered significant**
Regime Shift - Effects on Carrying Capacity	**CS- Recent trends in fur seals and Steller sea lions indicate that carrying capacity for these species has declined from historical highs**
S = Significant, CS = Conditionally Significant, I = Insignificant, U = Unknown, + = positive, - = negative	

4.6 Coastal Zone Management Act of 1972

Implementation of the preferred alternative would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Management Program within the meaning of Section 30 (c) (1) of the Coastal Zone Management Act and its implementing regulations.

4.7 Regulatory Impact Review

The requirements for all regulatory actions specified in Executive Order (E.O.) 12866 are summarized in the following statement from the order:

> In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.
>
> E.O. 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be "significant." The preferred alternative is not considered a "significant regulatory action" because it does not: (1) have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raise policy issues arising out of the President's priorities or the principles set forth in this Executive Order. Based on these criteria, NMFS determines that the preferred alternative is not significant for purposes of E.O. 12866.

The Regulatory Impact Review is also designed to provide information to determine whether the proposed regulation is likely to be "economically significant." The preferred alternative is not considered to have a significant economic effect because it does not result in any of the impacts described above.

4.8 Effects of Non-consumptive Resource Use

While no market exists within which northern fur seals are “traded” (in the traditional economic sense), they nonetheless have had economic value to a few subsistence users. They also have a large cultural value to Alaska Natives, as well as a large non-consumptive value to the non-Native public. In general, it can be demonstrated that society places economic value on (relatively) unique environmental assets, even if those assets are never directly exploited. That is, for example, society places real (and measurable) economic value on simply “knowing” that, in this case, northern fur seals are flourishing in their natural environment.

Substantial literature has developed which describes the nature of these non-use values to society. In fact, it has been demonstrated that these non-use economic values may include several dimensions, among which are "existence" value, "option" value, and "bequest" value. As the respective terms suggest, society places an economic "value" on, in this case, the continued *existence* of northern fur seals; society further "values" the *option* it retains through the continued existence of the resource for future access to the northern fur seal population; and society places "value" on providing future generations the opportunity to enjoy and benefit from this resource. These estimates are additive and mutually exclusive measures of the value society places on these natural assets, and are typically calculated as "willingness-to-pay" or "willingness-to-accept" compensation (depending upon with whom the implicit ownership right resides) for non-marginal changes in the status or condition of the asset being valued.

Quantitatively measuring society's non-use value for an environmental asset (e.g., northern fur seal), is a complex but technically a feasible task. However, in the current situation, an empirical estimation of these values is unnecessary, because the MMPA and the ESA implicitly assume that society automatically enjoys a *"net benefit"* from any action which protects marine mammal species (including the habitat they rely upon), and/or facilitates the recovery of populations of such species (or their habitat). Therefore, it is neither necessary nor appropriate to undertake the estimation of these benefits. It is sufficient to point out that these very real "non-use" values to society from conservation measures for northern fur seals do exist. Therefore, the effect of implementing the preferred alternative is likely to produce an overall net social and economic benefit.

4.9 Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA), first enacted in 1980, was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, a unit of government, or nonprofit organization frequently has a bearing on its ability to comply with a federal regulation. Major goals of the RFA are: (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require that agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group distinct from other entities and on the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action.

On March 29, 1996, President Clinton signed the Small Business Regulatory Enforcement Fairness Act. Among other things, the new law amended the RFA to allow judicial review of an agency's compliance with the RFA. The 1996 amendments also updated the requirements for a final regulatory flexibility analysis, including a description of the steps an agency must take to minimize the significant economic impact on small entities. Finally, the 1996 amendments expanded the authority of the Chief Counsel for Advocacy of the Small Business Administration (SBA) to file *amicus* briefs in court proceedings involving an agency's violation of the RFA.

In determining the scope, or 'universe', of the entities to be considered in an RFA, NMFS generally includes only those entities, both large and small, that can reasonably be expected to be directly or indirectly affected by the proposed action. If the effects of the rule fall primarily on a distinct segment, or portion thereof, of the industry (e.g., user groups, geographic area), that segment would be considered the universe for the purpose of this analysis. NMFS interprets the

intent of the RFA to address negative economic impacts, not beneficial impacts, and thus such a focus exists in analyses that are designed to address RFA compliance. NMFS has determined that this final DEIS does not have negative economic impacts to small entities as defined and, as such, an Initial Regulatory Flexibility Analysis, pursuant to 5 U.S.C. 603, is not required.

4.10 Consultation and Coordination with Tribal Governments

This DEIS is consistent with policies and guidance established in the Presidential Memorandum of April 29, 1994 "Government-to-Government Relations with Native American Tribal Governments." NMFS has taken several steps to consult and inform affected tribal governments and solicit their input during development of these final regulations including the development of co-management agreements with the Tribal Governments of St. Paul (in 2000) and St. George (in 2001). See Appendix A.

Chapter 5 Consultation and Coordination

5.1 Summary of Public Involvement

A Notice of Intent (NOI) announcing scoping meetings and request for comments for the "Intent to Analyze the Effects of the Subsistence Taking of Northern Fur Seals on the Pribilof Islands, Alaska," was published in the 68 Federal Register 36539, Wednesday June 18, 2003. Comments were accepted through September 16, 2003. St. Paul and St. George have sent letters regarding northern fur seal subsistence changes. No comments were received from the general public in response to the NOI. Scoping meetings were held on St. Paul Island during the last week of October 2003 and on St George Island during the first week of November 2003.

5.2 Comments from Scoping Meetings on St. Paul and St. George

Scoping discussions covered a wide range of topics and issues in addition to those regarding review and revision of the regulations governing the subsistence fur seal harvest on the Pribilofs as announced in the FR notice.

Regarding changes to the current harvest regulations, the individual opinions and perspectives ranged from more stringent regulations to removal of all regulations. It was expressed that co-management under the MMPA is the preferred approach to the management and conduct of the subsistence fur seal harvest on the Pribilofs, and that any regulations which inhibit or restrict further implementation and application of the co-management process should be modified or removed. It was also the consensus of both communities that the lengthy process to review and revise the harvest regulations, including the fulfillment of any required NEPA documents, should not interfere with the continuation of the annual subsistence harvests on either island.

Discussions during each of the scoping meetings also included the review and revision of the Conservation Plan for the Northern Fur Seal which the NMFS and tribal governments are currently involved in. Though this and other issues were not intended to be part of the scoping process regarding changes to the harvest regulations, the relationship between the two was clearly identified and was therefore included in the community discussions. The consensus perspective and opinion of each community reflected a serious commitment to the co-management process. They regarded the revision of the conservation plan to be fundamental to that process, considering that the plan was published (1993) prior to the MMPA amendments of 1994 which included Section 119 authority for the NMFS to enter into marine mammal co-management agreements with Alaskan Native Organizations such as the Pribilof islands tribal governments.

As co-management is not included in the current conservation plan, revisions to incorporate and apply Section 119 of the MMPA as the primary management authority and approach regarding northern fur seals and their Pribilof Islands habitat, both communities expressed their concern and desire to minimize any conflicts or avoidable delays to the interrelated effort and progress to revise both the current regulations and conservation plan. It was further agreed in general that many potential conflicts and delays could be avoided or mitigated by combining both revision efforts/products into one NEPA process if at all possible. An additional recognized value of this approach was that the resulting NEPA document would provide a fundamental, programmatic description of and basis for the long-term management of the northern fur seal under co-

management to rebuild the species to a non-Depleted status and, for the conservation of the essential habitat and resources necessary to maintain this status.

The tribal governments have expressed an interest in a more comprehensive cooperative management regime for the Northern fur seal, which would include shared responsibility for setting harvest limits, research, and addressing conservation issues such as habitat protection and the effects of commercial fishing on this stock. NMFS is addressing these suggestions, which will entail changes to existing Federal regulations and the development of additional documentation

5.3 Additional Coordination and Consultation with the Pribilof Islands Subsistence Communities

The harvest process described herein is the product of consistent consultations and coordination between NMFS and the local subsistence communities as represented by the tribal governments. This process has continued to evolve and improve over the many years the federal government has been involved with the management of the northern fur seal and administration of the Pribilof Islands. With the adoption of co-management agreements between NMFS and Pribilof tribal governments, the harvest process and operations have continued to improve in spite of significant changes within the natural environment and subsistence communities of the Pribilof Islands.

This action and the estimates of subsistence need contained herein are also the result of discussions between NMFS and the respective tribal governments of St. Paul and St. George Islands under provisions of the official co-management agreements between NMFS and the tribal governments, as provided for by Section 119 of the MMPA as amended in 1994.

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Chapter 7 List of Preparers

David R. Cormany

Fishery Biologist, and coordinator of the Northern Fur Seal and Pribilof Islands Program for NMFS, Alaska Region, Anchorage, Alaska.

P. Michael Payne

Michael Payne received a M.S. Degree in Fishery Biology, Iowa State University in 1975. He was the Marine Mammal Recovery Program Coordinator in the Marine Mammal Division, Office of Protected Resources, NMFS, 1991 through 1996; the Chief of the Marine Mammal Division, the Office of Protected Resources, NMFS, NOAA, Silver Spring, Maryland, 1996 to 1999; Assistant Regional Administrator, PRD, AKR, NMFS, from 1999 to 2003; and since 2004 is the Chief of the Marine Mammal Division, the Office of Protected Resources, NMFS, NOAA, Silver Spring, Maryland.

Bradley K. Smith

Coordinator, Anchorage Field Office, NMFS, Alaska Region, Juneau, Alaska. Mr. Smith received a B.S. in Fisheries Science from Colorado State University in 1975. He has worked with as a Federal biologist since 1977.

Daniel J. Vos

Daniel J. Vos is a biologist, NMFS, Alaska Region, Anchorage, Alaska. He received a M.S. Degree in Environmental Science from Alaska Pacific University in 2003. He has been with NMFS since 1998 and has worked as a Federal Biologist since 1988.

Tamra Faris

Tamra Faris is a Fisheries Biologist, AKR, NMFS, at Juneau, Alaska, and Nepa Coordinator. She reviewed this document. Ms. Faris received her B.S. Degree from the University of Alaska, Fairbanks, Alaska, and a M.S. Degree from the University of Washington, Seattle, Washington. Ms. Faris has conducted workshops on NEPA process for Alaska Region. She has been with NMFS for 25 years.

Chapter 8 List of Interested Parties, Agencies, Organizations and Persons

Alaska Center for the Environment
519 W. 8th Ave., #201
Anchorage, AK 99501

ADF&G - Wildlife Conservation Division
P.O. Box 25526
Juneau, AK 99802-5526

Alaska Department of Fish & Game
333 Raspberry Road
Anchorage, AK 99518

Alaska Department of Fish & Game
P.O. Box 25526
Juneau, AK 99802-5526

Alaska Division of Governmental Coordination
P.O. Box 110030, 240 Main Street, Suite 500
Juneau, AK 99811-0030

Alaska Marine Conservation Council
Box 101145
Anchorage, AK 99510

Alaska Native Marine Mammal Hunter's Committee
c/o 6430 Norm Drive
Anchorage, AK 99507

Aleut Marine Mammal Commission
P.O. Box 920045
Dutch Harbor, AK 99692

Center for Marine Conservation
425 G. St., Suite 400
Anchorage, AK 99501

City of St. George
P.O. Box 960
St. George Island, AK 99591

City of St. Paul
P.O. Box 108
St. Paul Island, AK 99660

Environmental Protection Agency, Region 10
1200 6th Avenue ECO-088
Seattle, WA 98101

Environmental Protection Agency, Region 10
222 West 7th Avenue #19
Anchorage, AK 99513

LGL Alaska
4175 Tudor Centre Dr., #202
Anchorage, AK 99508

Marine Mammal Commission
4340 East-West Hwy., Room 905
Bethesda, MD 20814

National Audubon Society, Alaska State Office
308 G Street, Suite 217
Anchorage, AK 99501

North Pacific Fishery Management Council
605 W. 4th Ave. Room 306
Anchorage, AK 99510

The Nature Conservancy
715 L St., Suite 100
Anchorage, AK 99501

Oceana
175 South Franklin Street, Suite 418
Juneau, AK 99801

The Ocean Conservancy
425 G. Street, Suite 400
Anchorage, AK 99501

Pribilof Islands Marine Mammal Commission
P.O. Box 11
St. Paul Island, AK 99660

Pribilof Islands Stewardship Program
P.O. Box 306
St. Paul Island, AK 99660

St. George Fishermen's Association
P.O. Box 969
St. George Island, AK 99591

St. George Tanaq Corporation
P.O. Box 951
St. George Island, AK 99591

St. George Traditional Council
P.O. Box 940
St. George Island, AK

Sierra Club - Alaska Field Office
201 Barrow St.
Anchorage, AK 99501

Tanadgusix Corporation (TDX)
P.O. Box 88
St. Paul Island, Alaska 99660

Tribal Government of St. Paul
P.O. Box 86
St. Paul Island, AK 99660

Trustees for Alaska
1026 W. 4th Ave., Ste. 201
Anchorage, AK 99501

USFWS - Marine Mammal Management
1011 East Tudor Road
Anchorage, AK 99501

Appendix A- NMFS/St. Paul Co-management Agreement

AGREEMENT
BETWEEN THE
ALEUT COMMUNITY OF ST. PAUL ISLAND
AND THE
NATIONAL MARINE FISHERIES SERVICE

I. PARTIES AND SCOPE

This document constitutes an agreement between the National Marine Fisheries Service (NMFS) and The Aleut (Unangan) Community of St. Paul Island, Alaska, otherwise referred to as the Parties.

A. This Agreement covers the species *Callorhinus ursinus* and *Eumetopias jubatus*, referred to as the laaqun (Unangan) or northern fur seal, and the qawan (Unangan) or Steller sea lion, hereafter referred to as fur seal and sea lion, respectively. It encompasses St. Paul Island, Alaska and associated interaction areas (Walrus, Otter Islands and Sea Lion Rock). However, specific actions taken or recommendations made pursuant to this Agreement may be limited to certain regions or sub-areas, as deemed appropriate.

B. NMFS is the congressionally mandated federal agency responsible for the protection, conservation and management of fur seals and sea lions within jurisdiction of the United States of America.

(III) The Tribal Government of St. Paul (TGSNP) represents the conservation and co-management interests of fur seal and sea lion hunters and customary/traditional practices of the Aleut Community of St. Paul Island, Alaska.

II. AUTHORITIES

The Parties recognize and acknowledge that:

A. NMFS has the authority to enter into this Agreement with the TGSNP under Section 119 (16 U.S.C. 1388) of the Marine Mammal Protection Act of 1972, as amended (MMPA), and the Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. 1531 et seq.).

B. The TGSNP has the authority to enter into this Agreement according to its constitution and bylaws for the Aleut Community of St. Paul Island.

III. PURPOSE

The TGSNP, representing the interests of the Unangan (Aleuts) of St. Paul Island and NMFS, representing the interests of the citizens of the United States of America, desire to work in partnership for the purpose of:

A. Promoting the conservation and preservation of fur seals and sea lions;

B. Utilizing traditional knowledge, wisdom and values, and conventional science in research, observation, and monitoring efforts to establish the best possible management actions for the protection and conservation of fur seals and sea lions;

C. Establishing a process of shared local responsibilities regarding the management and research of fur seals and sea lions on behalf of the citizens of the United States;

D. Identifying and resolving through a consultative process any management conflicts that may arise in association with fur seals and sea lions; and

E. Providing information to hunters and the affected community, as a means of increasing the understanding of the sustainable use, management, and conservation of fur seals and sea lions.

To achieve these purposes, this Agreement provides for:

1. Cooperation between members of the TGSNP and NMFS in the conservation and management of fur seals and sea lions for the year 2000 and thereafter; and

2. The establishment of a St. Paul Island Co-Management Council under this Agreement.

IV. BACKGROUND

In April 1994, the MMPA was amended to include Section 119 "Marine Mammal Cooperative Agreements in Alaska." Section 119 formalizes the rights of Alaska Native Organizations to participate in conservation-related co-management of subsistence resources and their use. Section 119 also authorized the appropriation of funds to be transferred by NMFS to Alaska Native Organizations to accomplish these activities.

V. GUIDING PRINCIPLES

A. The best way to conserve and provide for stewardship of fur seals and sea lions critical to traditional practices and the Unangan way of life is through a partnership between the TGSNP and NMFS that provides for full participation by the Unangan of St. Paul, through the TGSNP, in decisions affecting the management of marine mammals used for subsistence purposes .

B. As the primary customary/traditional users of the fur seals and sea lions in the Bering Sea Region, the Aleut Community of St. Paul is committed to long term sustainable use of these animals for cultural continuity, food, clothing, arts, and crafts. The rich Unangan tradition and ancestral interaction with fur seals and sea lions provides a unique understanding and knowledge of these animals.

C. Under the MMPA as amended, NMFS is mandated to employ the best conventional science and natural resource management practices available to maintain marine mammal stocks and populations at levels necessary to sustain customary/traditional uses by indigenous peoples of Alaska, including the Unangan of St. Paul.

D. A key to the success of this partnership is to incorporate the spirit and intent of co-management by building trust and by establishing close cooperation and communication between the two Parties. Shared decision making shall be through consensus, based on mutual respect and understanding the cultural perspective of each party.

VI. CO-MANAGEMENT OF FUR SEALS AND SEA LIONS ON ST. PAUL ISLAND, ALASKA

Understanding that the structure, process and responsibilities associated with the successful implementation of this Agreement and effective co-management of fur seals and sea lions on St. Paul must be clearly defined, the Parties agree that;

A. Operational Structure

1. Regarding the need for a cooperative effort to conserve fur seal and sea lion populations and to maintain a sustainable harvest for traditional uses, the Parties agree to establish a St. Paul Island Co-Management Council (hereafter referred to as Council).

2. Upon the effectness of this Agreement, the TGSNP and NMFS shall each appoint three (3) members to the Council. The members of the Council shall serve at the pleasure of the Party by which they were appointed. The Council shall select co-chairs by consensus. One (1) co-chair shall be a representative of the TGSNP and one (1) a representative of NMFS.

3. The Council shall hold at least two (2) meetings a year and may hold other meetings, as necessary, at the request of either Party. Council meetings shall be held and conducted on St. Paul Island Alaska, unless mutually agreed otherwise. The Co- Chairs shall circulate a draft agenda for comment two (2) weeks prior to each meeting. A quorum of four (4) members is required to conduct a meeting. Decisions of the Council shall be through consensus, based on mutual respect. Meetings of the Council shall be open to the public.

4. The Council shall perform the following actions:

a. Develop annual management plans, monitoring programs, and research programs for St. Paul Island;

b. Review annually the contents, performance and responsibilities in this Agreement;

c. Review and assess progress towards implementation of this Agreement;

d. Identify challenges to achieving the purpose of this Agreement;

e. Recommend solutions to any identified challenges;

f. Identify future courses of action; and

g. Review laws and regulations governing the subsistence take and use of fur seals and sea lions.

B. Cooperative Responsibilities:

Guided by the Council, the TGSNP and NMFS will share the following responsibilities in each of the subject areas identified:

1. Management Plans: Develop local management plans for fur seals, sea lions, and their associated haul-out and rookery areas. The management plans will be reviewed annually. The management plans will include the topics and items deemed appropriate and necessary by the Council such as:

a. Monitoring and Research Programs; Harvest and Rookery Management; Local Regulations and Enforcement Plans for the protection of fur seals, sea lions and their haulouts or rookeries;

b. Education and Information; Training; Funding; Summary of recent progress and new information;

c. Outline of future goals and activities; Identify information and conservation needs and; and

d. Other items as deemed necessary.

2. Monitoring Programs: To establish consistent year-round rookery and shoreline observations to document and respond to activities on the rookeries that might include, but not be limited to, wildlife behavior, disturbance, oil spills, and other activities as appropriate. The Parties agree to:

a. Develop and implement long term monitoring programs for local fur seal and sea lion populations, associated rookeries and haul out areas to document and respond to any observed changes;

b. Conduct seasonal debris clean-ups and surveys at rookeries and beaches identified by the Council; and

c. Identify the appropriate equipment, facilities, and technical assistance to conduct rookery and beach clean up programs and surveys as necessary.

3. Research Programs: As advised and monitored by the Council, the Parties agree to promote and continue the following specific research efforts:

a. Assessment of population abundance and trends by stock and, as possible, by sub-areas within those stocks using conventional science methods;

b. Assessment of habitat use and seasonal movements (including information on preferred haulout sites, foraging areas, and prey composition);

c. Assessment of sources of mortality and the extent, timing, and location of such mortality; and

d. Assessment of population status (including age structure, vital rates, and indices of physical condition).

4. Disentanglement Program: To reduce the level of entanglement and effect the release of fur seals and sea lions from marine debris, the Parties agree to promote and continue the following efforts and activities :

a. Collection of information regarding date, location, sex, age, age class, debris type, capture attempts, disentanglements, degree of wound, re-sightings, animals sheared, animals with shear marks, scarred animals, and tagged animals and numbers;

b. Calculation of entanglement rates incorporating data from the annual subsistence fur seal harvest including debris type, width, mesh diameter, twine size and other information as appropriate; and

c. Maintenance of existing research and identification of the appropriate equipment, facilities, and technical assistance to conduct the disentanglement program.

5. Local Opportunities for Scientific Research Projects: Recognizing the need for and value of community awareness and involvement regarding the protection and conservation of fur seals and sea lions, the Parties agree to undertake a collaborative effort to accomplish the following:

a. Establish mentoring opportunities for local youth regarding environmental science and natural resource management;

b. Work with the local school district regarding support of and participation in science fairs and special projects regarding environmental education and natural resource management; and

c. Coordinate with local entities and programs to establish employment opportunities regarding environmental science and natural resource management.

6. Maintenance of Fur Seal Rookeries: To improve the condition and ensure continued use of the fur seal rookery and haulout areas, the Parties agree to:

a. Design, construct, and maintain permanent signs for each rookery;

b. Put up road barricades at Reef, Ketovi, and Northeast Point Rookeries as specified by the governing regulations;

c. Identify the appropriate equipment and materials to maintain the rookery catwalks, tripods, signs, and barricades; and

d. Repair and maintain annually, all catwalks and tripods identified by the Council.

7. Co-Managing the Harvest: To improve and advance the viability and sustainability of the subsistence take of fur seals the Parties agree:

a. To support and continue the annual Humane Observer contract for the subsistence fur seal harvest to ensure that the harvest continues to be conducted in a humane manner;

b. To negotiate and establish the beginning date of each annual fur seal harvest, in accordance with current regulations;

c. That the Tribal Ecosystem Conservation Office (ECO) Co-Directors, in consultation with the Harvest Foreman and the NMFS Representative, and in accordance with current regulations, will determine which fur seal rookery to harvest on a daily basis;

d. That the ECO Co-Directors and Harvest Foreman will accept responsibility for ensuring an absolute minimum of heat stressed animals as is possible. Jointly with the Humane Observer and NMFS Representative, they will have the authority to shut down the harvest for that day due to temperature or other factors contributing to heat stress;

e. The ECO Co-Directors and Harvest Foreman will accept responsibility for keeping the number of females taken to the following levels;

(i). When five (5) females have been killed the harvest will stop for a period of two (2) days so that the harvest workers can discuss the reasons why females were harvested and correct problems contributing to the take of females, and

(ii). When eight (8) females have been killed the harvest may be stopped for that season.

f. The ECO Co-Directors and Harvest Foreman will insure the entire harvest operation is done in an efficient manner to avoid or minimize unnecessary injury and mortality, and also that the harvest fields are left litter-free;

g. The ECO Co-Directors will work with NMFS to promote and establish "full utilization" by making every attempt within the law to use all parts of the animals taken at the harvest. All parts means the pelts, teeth, guts, bacula ("seal sticks"), carcasses and other inedible by-products of the subsistence harvest the Tribe can use within existing laws and regulations to cover harvest and processing costs;

h. The ECO will conduct local surveys of the subsistence take of fur seals and sea lions. The surveys will include:

(i). Number harvested;
(ii). Number struck and/or lost;
(iii). Total take (harvest plus struck and lost);
(iv). Sex of harvested or recovered animals;
(v). Categories harvested or recovered (number of pups, subadults, or adults);
(vi). Designated fur seal haul outs and sea lion hunting sites as determined annually by the Council; and
(vii). The collection of biological samples if deemed necessary by the Council;

8. Providing Education and Information: Recognizing the value of an informed public regarding the protection, conservation and management of fur seals and sea lions, the Parties agree to:

a. Educate and inform subsistence harvest workers in the most appropriate methods for harvesting and processing fur seals;

b. Educate and inform the Aleut Community of St. Paul about the health and status of northern fur seals and sea lion populations on St. Paul Island including factors contributing to the sea lion's decline or increase;

c. Educate and inform St. Paul sea lion hunters in the proper methods for hunting sea lions;

d. Develop a training and internship program to directly involve local people in harvest monitoring, bio-sampling, and research programs;

e. Involve hunters and customary/traditional users in the development of regulatory and management decisions affecting the subsistence use of fur seals and sea lions through representation on the Council; and

f. Designate the TGSNP as the primary local contact for exchange of information regarding fur seals and sea lions.

C. Training

To establish a fair and equitable co-management relationship and a level of practical experience and technical expertise, the Parties agree to:

1. Work in partnership to develop and provide cross cultural information, including understanding of Unangan ways of life, traditional ways of knowing, local concerns and issues regarding fur seal and sea lion use by the Aleut Community of St. Paul (e.g., food, medicinal, handicraft, arts, and spiritual uses), as well as agency policies, legal and administrative constraints, and scientific approaches for managers, researchers and others coming to the island;

2. Obtain appropriate training for local Conservation Officers in Tribal and federal regulations;

3. Provide mentors and research opportunities for local individuals whenever possible; and

4. Share TGSNP/NMFS planning, research, and data collection procedures and provide appropriate training in those procedures.

VII. CONSULTATION

To facilitate the implementation of this Agreement and ensure an equitable working relationship, the Parties agree that:

A. The TGSNP and NMFS shall consult on a routine basis as set forth in this Agreement. In addition, the TGSNP President and NMFS Representative for St. Paul Island shall communicate on an as needed basis concerning matters related to northern fur seals and sea lions; and

B. Should disagreement arise on interpretation of the provisions of this Agreement (or amendments and/or revisions thereto) that cannot be resolved at the operating level, the Parties shall submit written statements regarding the disagreement to the Council. Within thirty (30) days from receipt of the written statements, the Council shall provide copies to each Party and convene a meeting of the Council for the purpose of resolving the disagreement. If disagreement remains unresolved after the thirty day period and absent a mutual agreement by the Parties to extend the time period, the Council shall refer the matter to higher levels of the respective Parties for appropriate action.

VIII. REGULATION AND ENFORCEMENT

To effectively implement this Agreement, the Parties agree that:

A. The TGSNP recognizes the Secretary of Commerce's authority to enforce the provisions of the MMPA, ESA and Fur Seal Act applicable to the subsistence harvest of fur seals and sea lions; and

B. NMFS recognizes the existing Tribal authority to govern and regulate their members and conduct regarding the traditional uses of fur seals and sea lions, and acknowledges tribal authority to conduct the following in cooperation with NMFS:

1. Conduct rookery disturbance monitoring and local enforcement upon closing of the rookeries and to monitor sea lion hunting activities;

2. Conduct access permitting for the fur seal viewing blinds and fur seal harvest;

3. Develop and implement Tribal ordinances governing the hunting of sea lions and harvesting of fur seal and provide NMFS with up to date Tribal ordinances;

4. Develop and implement effective local processes for informing the public regarding applicable Federal and Tribal laws and regulations;

5. Develop and implement cooperative enforcement plans between Federal, local and Tribal authorities; and

6. Review, recommend, and advise on revisions to federal regulations governing fur seals and sea lions.

IX. FUNDING

A. Recognizing that certain costs may be associated with the implementation of this Agreement, both Parties agree that long term funding for sustained co-management and conservation programs is important for the health of fur seals and sea lions. No financial commitment on the part of any Party is required by this Agreement. Any requirement of this Agreement for the obligation or expenditure of funds by NMFS or TGSNP shall be subject to the availability of appropriated funds.

B. The TGSNP and NMFS will assist each other in seeking funding from a variety of sources to support research and management projects of mutual benefit regarding fur seals and sea lions.

C. TGSNP will submit a yearly budget to NMFS to fulfill specific responsibilities stated in this Agreement for each fiscal year the Agreement is in effect.

D. NMFS will review the annual budget and, after consultation with the TGSNP, will assist with the obligation and provision of funding as deemed appropriate under the authorities specified in Section II (A) of this Agreement.

X. OTHER PROVISIONS

A. Nothing in this Agreement is intended or shall be construed to authorize any expansion or change in the respective jurisdiction of Tribal, Federal, or State Governments over fish and wildlife resources, or alter in any respect the existing political or legal status of Alaska Native entities.

B. Except as expressly provided herein, nothing in this Agreement shall restrict or limit any right or privilege of the TGSNP (Unangan Community of St. Paul) with respect to fisheries, customary/traditional uses, or other use of any species.

C. Nothing herein is intended to conflict with current National Oceanic and Atmospheric Administration or NMFS directives. If the terms of this Agreement are inconsistent with existing laws, regulations, or directives of either of the Parties entering into this Agreement, then those portions of this Agreement which are determined to be inconsistent shall be invalid, but the remaining terms and conditions not affected by the inconsistency shall remain in full force and effect. At the first opportunity for revision of this Agreement, all necessary changes will be accomplished by either an amendment to this Agreement or by entering into a new Agreement, whichever is deemed expedient to the interests of both Parties.

D. This Agreement will stand as an official management tool for fur seals and sea lions as identified in Section I (A) of this Agreement.

E. Both Parties shall strive to support a policy of "no surprises" concerning contact with the media on potentially sensitive issues pertaining to northern fur seals and Steller sea lions. Each Party shall endeavor to consult with the other prior to initiating contact with the media on topics contained within this Agreement. Under circumstances in which the media initiates contact with one Party, the contacted Party shall inform the other Party and provide details on the nature of the information communicated. In addition, when a Party is contacted by the media concerning issues relevant to this Agreement, that Party shall provide the other Party's contact information to the media representative and request that the media representative contact the other Party.

F. Whenever possible, all scientists who plan to conduct research on behalf of either Party on or around St. Paul (as defined in Section I of this agreement) are required to advise the Council established herein in a timely manner as to the purpose, goals, and time-frame of the research, data gathering techniques, expected results and possible adverse impacts of the proposed research. The Council shall review this information and upon reaching a consensus, may provide comments and recommendations accordingly.

XI. ADOPTION, DURATION, AND MODIFICATION

A. This Agreement shall take effect upon the latest date of signature of the respective Parties and shall remain in effect until terminated by either of the Parties in accordance with the termination provision of this Agreement.

B. Modification of this agreement may be proposed at any time by either Party and shall become effective upon written approval by both Parties.

C. This Agreement may be terminated by either Party by providing forty-five (45) days prior written Notice of Termination to the other Party. Such Notice shall be addressed to the principal contact for the receiving Party.

XII. SIGNATORIES

In Witness Whereof, the Parties hereto have executed this Agreement to be effective as of the last written date below:

National Marine Fisheries Service

Signed by: 13 June 2000
James W. Balsiger Date
Administrator, Alaska Region
National Marine Fisheries Service
U. S. Department of Commerce
P. O. Box 21668
Juneau, Alaska 99802

Aleut Community of St. Paul Island

Signed by:
Richard Zacharof
President, Tribal Government of St. Paul
P.O. Box 86
St. Paul Island, Alaska 99660

Appendix B- NMFS/St. George Co-management Agreement

CO-MANAGEMENT AGREEMENT BETWEEN THE ALEUT COMMUNITY OF ST. GEORGE ISLAND AND THE NATIONAL MARINE FISHERIES SERVICE

I. PARTIES AND SCOPE

This document constitutes an agreement between the National Marine Fisheries Service and The Aleut (Unangan) Community of St. George Island, Alaska, otherwise referred to as the Parties.

A. This Agreement covers the species *Callorhinus ursinus* and *Eumetopias jubatus*, referred to as the laaqux (Unangan) or northern fur seal, and the qawax (Unangan) or Steller sea lion, hereafter referred to as fur seal and sea lion, respectively; and in addition, the use and management of the structure referred to locally as the old sealing plant. This Agreement encompasses activities and program developed and/or conducted by the parties on and adjacent to St. George Island, Alaska in the geographical and topical areas specified by the Co-management Council established pursuant to this Agreement.

B. The National Marine Fisheries Service (NMFS) is the congressionally mandated federal agency responsible for the protection, conservation and management of fur seals and sea lions within jurisdiction of the United States of America.

C. The St. George Traditional Council (STGTC), organized pursuant to the Indian Reorganization Act of 1934, is the legally recognized tribal organization for the Aleut people of St. George and it represents the conservation and co-management interests of fur seal and sea lion hunters and customary/traditional practices of the Aleut Community of St. George Island, Alaska.

II. AUTHORITIES

The Parties recognize and acknowledge that:

A. NMFS has the authority to enter into this Agreement with the STGTC under Section 119 (16 U.S.C. 1388) of the Marine Mammal Protection Act of 1972, as amended (MMPA), and the Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. 1531 et seq.), and the Department of Commerce Joint Project Authority (15 U.S.C. 1525).

B. The STGTC has the authority to enter into this Agreement according to its constitution and bylaws for the Aleut Community of St. George Island. Additional guidance is provided by Executive Order #13084, May 14, 1998 ("Consultation and Coordination with Indian Tribal Governments"; 63 FR 27655"); Presidential Memorandum, April 29, 1994 ("Government-to-Government Relations with Native American Tribal Governments"; 59 FR No.85).

III. PURPOSE

The STGTC, representing the interests of the Unangan (Aleuts) of St. George Island and NMFS, representing the interests of the citizens of the United States of America, desire to work in partnership for the purpose of:

A. Promoting the conservation and preservation of fur seals and sea lions;

B. Utilizing traditional knowledge, wisdom and values, and the best available science in research, observation, and monitoring efforts to establish the best possible management actions for the protection and conservation of fur seals and sea lions;

C. Establishing a process of shared local responsibilities regarding the management and research of fur seals and sea lions.

D. Identifying and resolving, through a consultative process, any conflicts that may arise in association with the management and conservation of fur seals and sea lions on and adjacent to St. George Island, Alaska.

E. Providing information to hunters and the affected community, as a means for increasing the understanding of sustainable use, management, and conservation of fur seals and sea lions.

F. Establishing a process of shared responsibility for the use, management, operation, and upkeep of the structure locally known as the old sealing plant.

To achieve these purposes, this Agreement provides for:

1. Cooperation between members of the STGTC and NMFS in the conservation and management of fur seals and sea lions for the year 2001 and thereafter, and;

2. The establishment of a St.George Island Co-Management Council under this Agreement.

IV. BACKGROUND

In April 1994, the MMPA was amended to include Section 119 "Marine Mammal Cooperative Agreements in Alaska." Section 119 formalizes the rights of Alaska Native Organizations to participate in conservation-related co-management of subsistence resources and their use. Section 119 also authorized the appropriation of funds to be transferred by NMFS to Alaska Native Organizations to accomplish these activities.

V. GUIDING PRINCIPLES

A. The best way to conserve and provide for stewardship of fur seals and sea lions critical to traditional practices and Unangan way of life, is through a partnership between the STGTC and the federal statutory management authority, which to the maximum extent allowed by law, provides for full participation by Unangan of St. George, through the STGTC, in decisions affecting the management of marine mammals used for subsistence purposes.

B. As the primary customary/traditional users of the fur seals and sea lions on and adjacent to St. George Island, Alaska, the Aleut Community of St. George is committed to long term sustainable use of these animals for cultural continuity, food, clothing, arts, and crafts. The rich Unangan tradition and ancestral interaction with fur seals and sea lions provides a unique understanding and knowledge of these animals.

C. Under the MMPA as amended, NMFS is mandated to employ the best available science and natural resource management practices to maintain marine mammal stocks and populations at levels necessary to sustain customary/traditional uses by Unangan of St. George Island and other indigenous peoples of Alaska.

D. A key to the success of this partnership is to incorporate the spirit and intent of co-management by building trust and by establishing close cooperation and communication between the two Parties. Shared decision making shall be through consensus, based on mutual respect and understanding of each Party's cultural perspectives.

VI. CO-MANAGEMENT OF FUR SEALS AND SEA LIONS ON ST. GEORGE ISLAND, ALASKA

Understanding that the structure, process and responsibilities associated with the

successful implementation of this Agreement and effective co-management of fur seals and sea lions on St. George Island must be clearly defined, the Parties agree that;

A. Operational Structure

1. Regarding the need for a cooperative effort to conserve fur seal and sea lion populations and to maintain a sustainable harvest for traditional uses, the Parties agree to establish a co-management body to be called the St. George Island Co-Management Council (here after referred to as the Co-Management Council).

2. Upon effect of this Agreement, the STGTC and NMFS shall each appoint three (3) members to the Co-Management Council. The members of the Co-Management Council shall serve at the pleasure of the Party by which they were appointed. The Co-Management Council shall select co-chairs by consensus. One (1) co-chair shall be a representative of the STGTC and one (1) a representative of NMFS.

3. The Co-Management Council shall hold at least two (2) meetings a year and may hold other meetings, as necessary, at the request of either Party. Co-Management Council meetings shall be held and conducted on St. George Island Alaska, unless mutually agreed otherwise. The Co- Chairs shall circulate a draft agenda for comment two (2) weeks prior to each meeting. A quorum of four (4) members is required to conduct a meeting. Decisions of the Co-Management Council shall be through consensus, based on mutual respect. Meetings of the Co-Management Council shall be open to the public. The Co-Management Council may also hold executive sessions.

4. The Co-Management Council shall perform the following actions:

   a. Develop annual management plans, monitoring programs, and research programs for St. George Island.

   b. Annually review the contents, performance and responsibilities in this Agreement.

   c. Review and assess progress towards implementation of this Agreement.

   d. Identify challenges to achieving the purpose of this Agreement.

   e. Recommend solutions to any identified challenges.

   f. Identify future courses of action.

g. Review applicable laws and regulations governing the subsistence take and use of fur seals and sea lions for the purpose of making recommendations for appropriate change to NMFS.

B. Cooperative Responsibilities:

Guided by the Co-Management Council and process, the STGTC and NMFS will share the following responsibilities in each of the subject areas identified:

1. **Management Plans:** Develop local management plans for fur seals, sea lions, and their associated haul-out and rookery areas. Develop a management plan for the sealing plant. The management plans will be reviewed annually. The management plans will include the topics and items deemed appropriate and necessary by the Co-Management Council such as:

a. Monitoring and Research Programs; Harvest and Rookery Management; Local Regulations and Enforcement for the protection of fur seals, sea lions and their haul-outs or rookeries;

b. Education and Information; Training; Funding; Summary of recent progress and new information;

c. Outline of future goals and activities; Identify information and conservation needs;

d. A joint-use agreement for the use of the structure locally known as the old sealing plant for fur seal pelt processing, research, and interpretation and:

e. Other items as deemed necessary.

2. **Monitoring Programs:** To establish consistent year-round rookery and shoreline observations to document and respond to unusual or specific events including wildlife behavior, disturbance, oil spills, etc. the Parties agree to;

a. Develop and implement long term monitoring programs for local fur seal and sea lion populations, associated rookeries and haul out areas to document and respond to any observed changes;

b. Conduct seasonal debris clean-ups and surveys at rookeries and beaches identified by the Co-Management Council; and

c. Identify the appropriate equipment, facilities, and technical assistance necessary to conduct rookery and beach clean up programs and surveys.

3. **Research Programs:** As directed by the Co-Management Council, the Parties agree to promote and continue the following specific fur seal and sea lion research efforts, including, but not limited to:

a. Assessment of population abundance and trends by stock and, as possible, by sub-areas within those stocks using conventional science methods;

b. Assessment of habitat use and seasonal movements (including information on preferred haul-out sites, foraging areas, and prey composition);

c. Assessment of sources of mortality and the extent, timing, and location of such mortality;

d. Assessment of population status (including age structure, vital rates, and indices of physical condition);

4. **Disentanglement Program:** To reduce the level of entanglement and effect the release of fur seals and sea lions from marine debris, the Parties agree to promote and continue the following efforts and activities:

a. Collection of information regarding date, location, sex, age, age class, debris type, capture attempts, disentanglements, degree of wound, re-sightings, animals sheared, animals with shear marks, scarred animals, and tagged animals and numbers;

b. Calculation of entanglement rates incorporating data from the annual subsistence fur seal harvest including debris type, width, mesh diameter, twine size and other information as appropriate;

c. Maintenance of existing research and identify the appropriate equipment, facilities, and technical assistance to conduct the disentanglement program.

5. **Local Opportunities for Scientific Research Projects:** Recognizing the need for and value of community awareness and involvement regarding the protection

and conservation of fur seals and sea lions, the Parties agree to undertake a collaborative effort to accomplish the following:

a. Establish mentoring opportunities for local youth regarding environmental science and natural resource management;

b. Work with the local school district regarding support of and participation in science fairs and special projects regarding environmental education and natural resource management;

c. Coordinate with local entities and programs to establish employment opportunities regarding environmental science and natural resource management.

d. Annually meet for the purpose of assessing progress under this section, and to strategically plan new initiatives.

e. Develop such other activities, projects, and/or programs as the parties may agree to undertake from time to time.

6. **Maintenance of Fur Seal Rookeries:** To improve the condition and ensure continued use of the fur seal rookery and haul-out areas by local people and visitors, the Parties agree to:

a. Design, construct, and maintain permanent signs for each rookery.

b. Such other actions as deemed appropriate by the Co-Management Council.

7. **Co-Managing the Harvest:** To improve and advance the viability and sustainability of the subsistence take of fur seals the Parties agree:

a. To negotiate and establish the beginning date of each annual fur seal harvest, in accordance with applicable federal regulations;

b. That the Harvest Foreman and NMFS Representative will, in accordance with applicable federal regulations determine which fur seal rookery subsistence seal harvesting will be conducted on a daily basis;

c. That the Harvest Foreman will accept responsibility to ensure that the number of fur seals experiencing heat stressed is kept to the absolute minimum number as possible. The Harvest Foreman and the NMFS

Representative, will have the authority to shut down the subsistence harvest any day when the temperature or other factors contributing to heat stress;

d. The Harvest Foreman will accept responsibility for keeping the number of females taken to the following levels:

(i). When five (5) females have been killed the subsistence harvest will stop for a period of two (2) days so that the subsistence harvest workers can discuss the reasons why females were harvested and correct problems contributing to the take of females.

(ii). When eight (8) females have been killed the subsistence harvest may be stopped for that season.

e. The Harvest Foreman will insure the entire subsistence harvest operation is done in an efficient manner, and which avoids or minimizes unnecessary injury and mortality to the fur seals and the subsistence harvest workers;

f. The Harvest Foreman will ensure that the subsistence harvesting activities will not result in litter or undue damage to habitat and tundra;

g. The Co-Management Council will work with NMFS to promote and establish "full utilization" of fur seals taken in the subsistence harvest by making every attempt to use, to the maximum extent practical and allowed by law, all parts of the animals taken at the subsistence harvest. In addition to edible parts, the term "all parts" includes the pelts, teeth, guts, bacula ("seal sticks"), carcasses and other inedible by-products of the subsistence harvest which may be legally utilized to cover subsistence seal harvest and processing costs.

h. The Co-Management Council will conduct local surveys of the subsistence take of fur seals and sea lions on an annual basis. The surveys will include:

(i). Number harvested.
(ii). Number struck and/or lost.
(iii). Total take (harvest plus struck and lost).
(iv). Sex of harvested or recovered animals.
(v). Categories harvested or recovered (number of pups, sub-adults, or adults).

(vi). Designated fur seal haul outs and sea lion hunting sites as determined annually by the Co-Management Council.

(vii). The collection of biological samples if deemed necessary by the Co-Management Council.

i. Identify the appropriate equipment, facilities, and technical assistance necessary to conduct the subsistence fur seal harvest.

8. **Providing Education and Information:** Recognizing the imperative and value of an informed public regarding the protection, conservation and management of fur seals and sea lions, the Parties agree to:

a. Educate and inform subsistence harvest workers as to the most appropriate and best available methods for harvesting and processing fur seals;

b. Educate and inform the Aleut Community of St. George as to the health and status of northern fur seals and sea lion populations on St. George Island including factors contributing to the fur seal's and/or sea lion's decline or increase;

c. Educate and inform St. George Island sea lion hunters in the proper methods for hunting sea lions;

d. Develop a training and internship program to directly involve local people in harvest monitoring, bio-sampling, and research programs;

e. Involve hunters and customary/traditional users in the development of regulatory and management decisions affecting the subsistence use of fur seals and sea lions through representation on the Co-Management Council;

f. Designate the STGTC as the primary local contact for exchange of information regarding fur seals and sea lions.

C. Training

To establish a fair and equitable co-management relationship and an appropriate level of practical experience and technical expertise, the Parties agree to:

1. Work in partnership to develop and provide cross cultural training and information for efforts to increase understanding of Unangan ways of life,

traditional ways of knowing, local concerns and issues regarding fur seal and sea lion use by the Aleut Community of St. George (i.e. food, medicinal, handicraft, arts, and spiritual uses). In addition, the training will involve orientation on such issues as agency policies, legal and administrative constraints, and scientific approaches;

2. Obtain appropriate training for a local Conservation Officer, especially regarding the identification and proper documentation of Tribal and federal regulations;

3. Provide mentors and research opportunities for local individuals whenever possible;

4. Network and share STGTC/NMFS planning, research, and data collection procedures with the community of St. George and to provide the appropriate training in those procedures.

VII. CONSULTATION

To facilitate the implementation of this Agreement and ensure an equitable working relationship, the Parties agree that:

A. The STGTC and NMFS shall consult on a routine basis as set forth in this Agreement. In addition, the STGTC President and NMFS Representative for St. George Island shall communicate on an "as needed basis" concerning matters related to northern fur seals and sea lions that either Party deems suitable for such consultation.

B. Should disagreement arise on the interpretation of the provisions of this Agreement, or amendments and/or revisions thereto, that cannot be resolved at the operating level, the Parties shall submit written statements regarding the disagreement to the Co-Management Council created herein. Within thirty (30) days from receipt of the written statements, the Co-Management Council shall provide copies to each Party and convene a meeting of the Co-Management Council for the purpose of resolving the disagreement. In the event that the disagreement remains unresolved after the thirty day period and absent a mutual agreement by the Parties to extend the time period, the Co-Management Council shall refer the matter to higher levels of the respective Parties for appropriate action.

VIII. REGULATION AND ENFORCEMENT

To effectively implement this Agreement, the Parties agree that:

A. The STGTC recognizes the Secretary of Commerce's authority to enforce the provisions of the MMPA, ESA and Fur Seal Act applicable to the subsistence harvest of fur seals and sea lions.

B. NMFS recognizes the existing STGTC authority to govern and regulate their own members and their conduct regarding the traditional uses of fur seals and sea lions, and all parties acknowledge the authority of the tribe to conduct the following in cooperation with NMFS:

1. Conduct rookery disturbance monitoring and local enforcement upon closing of the rookeries and to monitor sea lion hunting activities;

2. Conduct access permitting for the fur seal viewing blinds and subsistence fur seal harvest;

3. Develop and implement Tribal ordinances governing the hunting of sea lions and harvesting of fur seal and provide NMFS with up to date Tribal ordinances;

4. Develop and implement an effective local processes for informing the public regarding fur seal and sea lion federal and tribal laws and regulations;

5. Review, recommend, and advise on revisions to federal regulations governing fur seals and sea lions.

IX. FUNDING

Recognizing that certain costs may be associated with the implementation of this Agreement, both Parties agree:

A. That long term funding for sustained co-management and conservation programs is important for the health of fur seals and sea lions. No financial commitment on the part of any Party is required by this Agreement. Any requirement of this Agreement for the obligation or expenditure of funds by NMFS or STGTC for the use of staff or agency resources provided by specific appropriations, shall be subject to the availability of appropriated funds.

B. The STGTC and NMFS will assist each other in seeking funding from a variety of sources to support research and management projects of mutual benefit regarding

fur seals and sea lions, as stated in this Agreement.

C. The STGTC will submit a yearly budget to NMFS to fulfill specific responsibilities stated in this Agreement for each fiscal year the Agreement is in effect.

D. The NMFS will review the annual budget and after consultation with the STGTC, will assist with the obligation and provision of funding as deemed appropriate under the authorities specified in Section II (A) of this Agreement.

X. OTHER PROVISIONS

A. Nothing in this Agreement is intended or shall be construed to authorize any expansion or change in the respective jurisdiction of Tribal, Federal, or State Governments over fish and wildlife resources, or alter in any respect the existing political or legal status of Alaska Native entities.

B. Except as expressly provided herein, nothing in this Agreement shall restrict or limit any right or privilege of the STGTC (Unangan Community of St. George Island) with respect to fisheries, customary/traditional uses, or other use of any species.

C. Nothing herein is intended to conflict with current National Oceanic and Atmospheric Administration or NMFS statutory requirement and mandate. If the terms of this Agreement are inconsistent with existing laws, regulations, or legal mandates of either of the Parties entering into this Agreement, then those portions of this Agreement which are determined to be inconsistent shall be invalid, but the remaining terms and conditions not affected by the inconsistency shall remain in full force and effect. At the first opportunity for revision of this Agreement, all necessary changes will be accomplished by either an amendment to this Agreement or by entering into a new Agreement, whichever is deemed appropriate to the interests of both Parties.

D. This Agreement will stand as an official management tool for fur seals, sea lions and the structure locally know as the old seal plant as identified in Section I (A) of this Agreement.

E. Both Parties shall strive to support a policy of "no surprises" concerning contact with the media on potentially sensitive issues pertaining to northern fur seals and Steller sea lions. Each Party shall endeavor to consult with the other prior to initiating contact with the media on topics

contained within this Agreement. Under circumstances in which the media initiates contact with one Party, the contacted Party shall inform the other Party and provide details on the nature of the information communicated. In addition, when a Party is contacted by the media concerning issues relevant to this Agreement, that Party shall provide the other Party's contact information to the media representative and request that the media representative to contact the other Party.

F. All scientists who plan to conduct research on behalf of either Party on or around St. George Island as defined in Section I of this agreement are required to advise the Co-Management Council established herein in a timely manner as to the purpose, goals, and time frame of the research, data gathering techniques, expected results and possible adverse impacts of the proposed research. The Co-Management Council shall review this information and upon reaching a consensus, may provide comments and recommendations accordingly.

XI. ADOPTION, DURATION, AND MODIFICATION

A. This Agreement shall take effect upon the latest date of signature of the respective Parties and shall remain in effect until terminated by either of the Parties in accordance with the termination provision of this Agreement.

B. Modification of this agreement may be proposed at any time by either Party and shall become effective upon approval by both Parties.

C. This Agreement may be terminated by either Party by providing forty-five (45) days prior written Notice of Termination to the other Party. Such Notice shall be addressed to the principal contact for the receiving Party.

XII. SIGNATORIES

In Witness Whereof, the Parties hereto have executed this Agreement to be effective as of the last written date below:

National Marine Fisheries Service

7/22/01

James Balsinger — Date

for

Administrator, Alaska Region
National Marine Fisheries Service
U. S. Department of Commerce
P. O. Box 21668
Juneau, Alaska 99801

Aleut Community of St. George Island

Boris Merculief — Date

President, St. George Traditional Council
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St. George Island, Alaska 99591