ENVIRONMENTAL ASSESSMENT

CO-MANAGEMENT AGREEMENT BETWEEN THE NATIONAL MARINE FISHERIES SERVICE AND THE COOK INLET MARINE MAMMAL COUNCIL FOR THE YEAR 2000

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Abbreviations and Acronyms

ADFG	Alaska Department of Fish and Game
ANO	Alaskan Native organization
CI	Cook Inlet
CIMMC	Cook Inlet Marine Mammal Council
DEIS	Draft Environmental Impact Statement
ESA	Endangered Species Act, as amended
FWS	U.S. Fish and Wildlife Service
MMPA	Marine Mammal Protection Act
MNPL	Maximum Net Productivity Level
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OSP	Optimum Sustainable Population
RIR	Regulatory Impact Review
RFA	Regulatory Flexibility Act

Summary

Description of the Proposed Action

The National Marine Fisheries Service (NMFS) is entering into a co-management agreement with the Cook Inlet Marine Mammal Council (CIMMC) for the year 2000. The co-management agreement specifies the conditions, and the number of strikes allowed, under which a subsistence harvest on Cook Inlet (CI) beluga whales could be undertaken during the year 2000. The agreement specifies a harvest level of one (1) whale strike during 2000.

Abundance estimates for the CI beluga whale stock indicate a decline of nearly 50 percent between 1994 and 1998, which caused NMFS to designate the stock as depleted under the Marine Mammal Protection Act (MMPA). Federal authority to enter into the co-management agreement for the year 2000 derives from Public Law 106-31, which prohibits the hunting of CI beluga whales prior to October 1, 2000 except pursuant to a cooperative agreement between NMFS and Alaskan Native organizations (ANOs); and Section 119 of the MMPA which allows the Secretary to enter into cooperative agreements with ANOs to conserve marine mammals and provide co-management of subsistence use by Alaska Natives.

Because the CI beluga whale stock is depleted, any long-term, Federally-approved management plan that includes harvest is considered a major action subject to the requirements of the National Environmental Policy Act (NEPA). Therefore, NMFS is separately preparing an Environmental Impact Statement (EIS) on conservation actions from 2001 and beyond, including proposed regulations to Federally regulate the subsistence harvest of CI beluga whales by Alaska Natives after 2000 and, thereby, to recover this stock.

NMFS has determined that the harvest of one whale during the year 2000, as specified in the co-management agreement, will not significantly impact the overall quality of the human environment or cause any adverse impacts on wildlife species listed under the Endangered Species Act (ESA) or MMPA.

NMFS evaluated the impact of allowing the harvest of a single whale in 2000 using computer simulations. These simulations indicated that the harvest of a whale in 2000 would not delay recovery of the stock. Recovery in the simulation occurred after 22 years (with no harvest), and the harvest of a single whale did not increase the time beyond 2000. The final abundance, upon achieving the recovery goal of 780 whales, was 1-2 whales fewer than when no harvest occurred.

Summary of Major Environmental Impacts

Alternative 1 (Status Quo or No Action) would result in the diminishment of cultural values and traditional needs within the local Cook Inlet Native community and the Native Village of Tyonek.

Alternative 2 would allow for the harvest of one whale during 2000 from a stock which has been significantly exploited in recent history, and which is now depleted. The level of removal under this alternative would meet NMFS intent to provide opportunity for continued traditional Native harvest while not significantly extending time to recovery. The delay in recovery time by selecting this alternative is negligible. This is the preferred alternative by NMFS.

Required Actions or Approvals

Under the preferred alternative, NMFS would enter into a co-management agreement with CIMMC under section 119 of the MMPA for 2000. A harvest of one whale would be authorized in this agreement under the provisions of Public Law 106-31 for the year 2000. Harvest in future years would be subject to Federal regulations under section 101(b) of the MMPA following the finalization of an EIS drafted by NMFS to assess the impacts of Federal regulations that allow for a long-term, sustainable harvest on CI beluga whales.

1.0 PURPOSE AND NEED FOR ACTION

1.1 Introduction

The purpose of the MMPA is to conserve and protect amrine mammals by regulating activities of U.S. citizens and activities of all persons within the jurisdiction of the United States. The MMPA imposes a general moratorium on the taking of marine mammals. However, section 101(b) of the MMPA provides an exemption from the Acts' take prohibitions allowing Alaskan Natives to harvest marine mammals for subsistence use or for purposes of traditional Native handicraft. Under the MMPA, the Federal Government may regulate Native subsistence harvest if (1) the stock in question is depleted, and (2) specific regulations are issued (16 U.S.C. 1371).

The CI beluga whale stock is hunted by Alaskan Natives, some of whom reside in communities on or near Cook Inlet and some of whom are from other Alaskan towns and villages. The whales concentrate off the mouths of several rivers entering upper Cook Inlet during the ice-free season, making them especially vulnerable to hunting. Most hunters use small motorboats launched from Anchorage, and hunt near these river mouths. The most common hunting technique is to isolate a whale from a group and pursue it into shallow waters. Whales are shot with high powered rifles and may be harpooned to aid in retrieval. The muktuk (skin with some of the underlying blubber attached) flippers, and tail flukes are normally harvested for food, and some hunters also retain the meat.

The CI stock of beluga whales is genetically and geographically isolated from other Alaskan populations of beluga whales. NMFS has conducted annual surveys of the CI beluga whale since 1994. Results of these surveys indicated that the CI beluga whale stock declined by approximately 50 percent between 1994 (estimate of 653 whales) and 1998 (estimate of 347 whales.

The over harvest of beluga whales in Cook Inlet for subsistence purposes is believed to be the primary factor responsible for the decline. Historically, harvest levels have been largely unreported. However, during a study between 1995 and 1997, NMFS estimated that the average annual harvest (including struck and lost whales) of CI beluga whales averaged 77 whales per year. Harvest at these rates could account for the 50 percent decline observed between 1994 and 1998.

Responding to the dramatic decline in this stock, NMFS initiated a Status Review of the Cook Inlet stock pursuant to the MMPA and ESA on November 11, 1998. The CI beluga whales' present status

and health was reviewed and recommendations were made for possible designation as depleted under the MMPA and/or listing as endangered or threatened under the ESA. The comment period on the status review (November 19, 1998 through January 19, 1999) was initiated at the same time that workshops were being convened to review beluga whale stocks throughout Alaska. The workshops were held by the Alaska Beluga Whale Committee (November 16-17, 1998) and the Alaska Scientific Review Group (November 18-20, 1998), a body established under the MMPA to provide scientific advice to NMFS regarding marine mammal conservation. To further ensure the status review was comprehensive and based on the best available scientific data, the closure of the public comment period was followed by a NMFS-sponsored workshop that reviewed relevant scientific information on this stock and received additional public comments and recommendations on March 8-9, 1999, in Anchorage, Alaska. The proceedings and abstracts of presentations from that workshop are summarized at Moore et. al. (1999).

On March 3, 1999, NMFS received a petition from seven organizations and one individual to list the CI stock of beluga whale as “endangered” under the Endangered Species Act of 1973, as amended (ESA). This petition requested emergency listing under section 4 (b)(7) of the ESA, designation of critical habitat, and immediate action to implement regulations to regulate the subsistence harvest of these whales. NMFS determined that these petitions presented substantial information which indicated the petitioned action(s) may be warranted (64 FR 17347, April 9, 1999).

At the time of the petitions, Federal regulations did not exist to control the subsistence harvest, and cooperative management agreements were not in place. To address this critical issue, Senator Stevens of Alaska introduced the following legislation:

> Notwithstanding any other provision of law, the taking of a CI beluga whale under the exemption provided in section 101(b) of the Marine Mammal Protection Act [16 U.S.C. 1371 (a)] between the date of the enactment of this Act and October 1, 2000, shall be considered a violation of such Act unless such taking occurs pursuant to a cooperative agreement between the National Marine Fisheries Service and affected Alaska Native organizations.

President Clinton enacted the bill on May 21, 1999 (Public Law 106-31).

Subsequent to the harvest prohibition, NMFS conducted a survey in June 1999. The abundance estimate from this survey was 357

whales. As a result of the abundance data, and other information presented in the status reviews, NMFS published a proposed rule to designate the Cook Inlet, Alaska, stock of beluga whales as depleted under the MMPA on October 19, 1999 (64 FR 56298). NMFS has issued a final rule designating the CI beluga whale stock as depleted. While the declining trend from 1994-1998 remained significant, the 1999 estimate was not significantly different from the 1998 estimate of 347 whales, and indicated a slight increase in the population size. One abundance estimate following the restriction of the harvest is insufficient evidence for a conclusive evaluation of the restriction; however, the apparent increase in the stock over the 1998 level is encouraging.

An agreement under section 119 of the MMPA for the cooperative management of CI beluga whales for the year 2000 has been developed between NMFS and CIMMC. This 2000 agreement, and any harvest during 2000, would fall under the provisions of Public Law 106-31. The agreement is presented in Appendix A. NMFS anticipates developing similar agreement(s) to address the management of this stock from 2001 to recovery.

1.2 Purpose of the Action

In order for a harvest to occur prior to October 2000, NMFS and an ANO must enter into an co-management agreement under section 119 of the MMPA. The purpose of this action is to enter into a co-management agreement to authorize the taking of one whale in 2000 for traditional and cultural subsistence purposes. Issues associated with this action include the impact of the level of harvest and its effects on the recovery of this stock, the impacts of not authorizing this harvest on Native culture, and how Native subsistence harvest may be managed in the future.

CIMMC is an organization comprised of Native Alaskans residing in the CI region who share an interest in local marine mammals. CIMMC includes Cook Inlet treaty tribes, Native hunters, and concerned Alaskan Natives. CIMMC was established to protect cultural traditions and promote conservation, management, and utilization of Cook Inlet marine mammals by Alaskan Natives.

The primary reason supporting this action is the need to recognize the importance of the CI beluga whale to Native culture and nutrition, and to provide for the continued opportunity to harvest these whales within the recovery phase. The subsistence harvest and use of the beluga whale is a component of Alaskan Native culture. The importance of the harvest transcends the

nutritional or economic value of the whale and provides identity to the cultures which now harvest the whales. Native hunters have stated their willingness to reduce harvest levels during the recovery period, but also express their belief that the skills, knowledge, and traditions associated with the subsistence hunting of these whales cannot be passed on to younger generations unless some level of harvest continues.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 General Considerations

The principal objectives of this document are to assess the consequences of entering into a co-management agreement allowing for one strike on a CI beluga whale during 2000 on the recovery of this depleted stock to its OSP level, and to provide for the continued traditional subsistence use by Alaskan Natives to support their cultural needs.

The NMFS/CIMMC agreement for 2000 represents a sharing of responsibilities and is intended to provide for the necessary authorities to manage this harvest while allowing Native Alaskans to manage many aspects of the hunt. The agreement will minimize wasteful practices and improve the efficiency of the harvest. All hunting parties must have a Native elder, experienced with beluga hunting, present to direct the harvest. This will reduce the chances of striking a calf, or female accompanied by a calf, or of striking any whale in an area or manner that may result in the loss of the whale. The agreement requires hunters to have equipment necessary to recover and process the harvested whale. All beluga hunting will be required to occur within the Susitna River delta area to minimize disproportionate impacts to smaller family groups. Hunting will be confined to certain time periods to reduce the possibility of harvesting pregnant females. Taking of calves, or adults accompanied by calves, will be prohibited. The sale of edible portions will be prohibited. These, and several other conditions to the hunt that have been agreed upon and specified in the agreement, will greatly improve harvest efficiency. Some of these requirements will be contained in subsequent Federal regulations under the MMPA, while others will remain the responsibility of the ANO.

Another provision of the agreement is the requirement for the parties to consult whenever any unusual event has occurred which might affect the impact of each year’s harvest on recovery, such as a mass stranding or oil spill. The harvest would not proceed after such an event until NMFS and the CIMMC had both given their approval.

The environmental consequences section (Chapter 4) of the EA discusses the impacts of a harvest of one whale (alternative 2) as compared to alternative 1 which would result in a moratorium on CI beluga whales. Chapter 4 also reviews the socio-cultural impacts of the harvest on the traditional Native Alaskan cultures of Cook Inlet. The alternatives are presented in Section 2.2. The impacts of these alternatives are evaluated from information and analyses presented in Chapters 3 (Affected Environment) and 4 (Environmental and Socio-cultural Consequences). This document also addresses other issues that may impact beluga whales and their habitat in Cook Inlet.

2.2 Alternatives

2.2.1 Alternative 1 - Status Quo or No Action

NMFS would not enter into any cooperative agreements under the provisions of Public Law 106-31 for the 2000 harvest under this alternative. There would be no harvest authorized under this alternative. This alternative would maximize the recovery potential of the CI beluga whale stock.

2.2.2 Alternative 2 -NMFS enters into an agreement with CIMMC that provides for one strike of a CI beluga whale

Alternative 2 establishes a harvest at one (1) strike in 2000. The goal of Alternative 2 is to allow the traditional subsistence harvest of CI beluga whales by Alaskan Natives to continue while recovering this stock.

Subsistence hunting for CI beluga would only occur under the terms of a co-management agreement (Appendix 1) under this alternative. The terms of the agreement would (1) specify the level of allowable take as described by this alternative; (2) require all hunting to occur between July 1 and July 31 to minimize the harvest of pregnant females; (3) prohibit the taking of calves or beluga accompanied by a calf, and (4) provide other measures to improve harvest efficiency.

This harvest would be administered jointly with Alaskan Natives through a cooperative agreement under section 119 of the MMPA. The cooperative agreement would specify the level of harvest as one (1) strike. A strike would be considered any event in which a bullet, harpoon, spear, or other device intended to take a whale contacts a beluga whale. Multiple strikes on a single whale would be considered one strike.

3.0 AFFECTED ENVIRONMENT

The purpose of this chapter is to describe the existing environment, including conditions and trends, that may be affected by the management alternatives. Descriptions focus on the physical features of Cook Inlet, Alaska, living marine resources, and habitat. The following description(s) of the physical environment of Cook Inlet provides a setting for subsequent discussions on the environmental impacts of each alternative. These descriptions are necessary for understanding how the alternatives being considered may affect the marine resources of Cook Inlet.

Because this assessment focuses only on the development of a co-management agreement between NMFS and CIMMC, and the biological and cultural environment surrounding that activity, this section focuses only on beluga whales and the use of beluga whale for subsistence purposes. The reader may find a more detailed discussion of the region's natural and human environments in the following reference documents: the University of Alaska's 1974 Alaska Regional Profiles: Southcentral Alaska (UAF 1974), and the Minerals Management Service's Final Environmental Impact Statement for the Cook Inlet Planning Area Oil and Gas Sale 149 (MMS 1996).

3.1 Biological Environment: Beluga Whales

Beluga whales are circumpolar in distribution and occur in seasonally ice-covered arctic and sub-arctic waters. In Alaska, beluga whales are found in marine waters from Yakutat to the Alaska-Canada border in the Beaufort Sea. These comprise five distinct stocks; Beaufort Sea, eastern Chukchi Sea, eastern Bering Sea, Bristol Bay, and Cook Inlet (Hill and DeMaster, 1998). Of these, the Cook Inlet stock is now considered to be the most isolated, based on the degree of genetic differentiation between the CI beluga whale stock and the four other stocks (O'Corry-Crowe et al., 1997). The observed differences in mitochondrial DNA found the Cook Inlet stock was the most genetically distinct of the Alaska beluga stocks, suggesting the Alaska Peninsula may be an effective barrier to genetic exchange. Supporting this assessment is the lack of observations of beluga whales along the southern side of the Alaska Peninsula. Murray and Fay (1979) postulated that this stock has been isolated for several thousand years.

3.1.1 Life History: The beluga whale is a small, toothed whale in the family Monodontidae, the only other member of which

is the narwhal. Beluga whales may reach lengths of 16 feet, although adult size is more often 12-14 feet. Native hunters report some whales may reach 20 feet. Males may weigh about 1,500 kg, or 3,307 pounds and females 1,360 kg or 2,998 pounds (Nowak, 1991). Calves are born dark gray to brownish gray and become lighter with age. Adults become white to yellow-white upon sexual maturity, although Burns and Seaman (1986) report females may retain some gray coloration for as long as 21 years. Beluga whales lack a dorsal fin and do not typically produce a visible "blow" on surfacing. Native hunters report these whales often surface with only the blowhole out of the water. For these reasons they are often obscure and difficult to see.

Beluga whales typically give birth to a single calf every two to three years after a gestation period of approximately 14 months. Calves are gray to brownish gray at birth. In Cook Inlet, calving is assumed to occur from mid-May to mid-July (Calkins, 1983), although Native hunters have observed calving from April through August (Huntington, 1999). Alaskan Natives described calving areas within Cook Inlet as the northern side of Kachemak Bay in April and May, off the mouths of the Beluga and Susitna Rivers in May and in Chickaloon Bay and Turnagain Arm during the summer. The warmer waters from these freshwater sources may be important to newborn calves during their first few days of life (Katona, Rough, and Richardson, 1983; Calkins, 1989). Mating shortly follows the calving period. Reports on the age of sexual maturity vary from ten years for females and 15 for males (Suydam, Burns, and Carroll, 1999), to four to seven years for females and eight to nine years for males (Nowak, 1991). Beluga whales may live more than 30 years (Burns and Seaman, 1986).

Beluga whales are covered with a thick layer of blubber, which accounts for as much as 40 percent of its body mass (Sergeant and Brodie, 1969). This fat provides thermal protection and stores energy. Native hunters in Cook Inlet report beluga whale blubber is thinner in the early spring than later in summer, suggesting that feeding in the northern inlet is important to the energetics of these animals. NMFS has measured blubber thickness to be in excess of 9 cm on CI beluga whales.

Beluga whales are extremely social animals which typically migrate, hunt, and interact together. Nowak (1991) reports average pod size as ten animals, although belugas may occasionally form much larger groups, often during migrations. Within Cook Inlet, groups of 10 to more than 100 beluga whales are typically observed during the summer. It is unclear whether these represent distinct social divisions. Native hunters have stated that beluga whales form family groups and that there are four types of belugas in Cook Inlet, distinguished by their size

and habits (Huntington, 1999).

3.1.2 Stock Abundance: Abundance surveys of CI beluga whales prior to 1994 were often incomplete, highly variable, and involved non-systematic observations or counts of concentrations in river mouths and along the upper Inlet. Based on aerial surveys in 1963 and 1964, Klinkhart (1966) estimated the stock at 300-400 animals, but the methodology for the survey was not described. Sergeant and Brodie (1975) presented an estimate for the Cook Inlet stock as 150-300 animals, but offer no source for this figure. Murray and Fay (1979) counted 150 beluga whales in the central Inlet on 3 consecutive days in August 1978, and estimated the total abundance would be at least three times that figure to account for poor visibility. Calkins (1984) reported on surveys of the upper Inlet between May and August of 1982, and estimated 200-300 belugas were seen in one concentration area. Hazard (1988) stated that an estimate of 450 whales may be conservative because much of Cook Inlet was not surveyed in these efforts.

An aerial survey of Cook Inlet in August 1979 resulted in a minimum direct count of 479 beluga whales (Calkins 1989). Using a correction factor of 2.7 developed for estimating submerged whales under similar conditions in Bristol Bay, he estimated maximum abundance of 1,293 whales. Because this is the most complete survey of the inlet prior to 1994 and incorporated a correction factor for animals missed during the survey in the estimate, the Calkins summary provides the best available data for estimating the historical abundance of CI beluga whales.

NMFS began systematic aerial surveys of beluga whales in Cook Inlet in 1994. Unlike previous efforts, these surveys included the upper, middle, and lower Inlet. Using both observers and videotape, this method also developed correction factors to account for whales not observed due to coloration (calves and juveniles are gray colored and do not contrast with the Inlet water), diving patterns, or because whales were missed by the survey track. These surveys have continued annually and have tracked a decline in abundance of nearly 50 percent between 1994 and 1999.

3.1.3 Distribution and Movements of CI Beluga Whales: Beluga whales generally occur in shallow, coastal waters, often in water barely deep enough to cover their bodies (Ridgway and Harrison, 1981). Some beluga whale populations make seasonal migrations, while others remain in relatively small areas year round. It is presently unknown whether this stock migrates seasonally from Cook Inlet and, if so, where it goes. Sightings from 1976 to 1979 and in 1997 indicate that at least some beluga whales are

present in Cook Inlet year round, although they are not likely to occupy the northernmost reaches (Calkins, 1983; MMS, 1999)

The whales begin to return to the upper Inlet in April and early May, commensurate with the eulachons' returning migrations to several streams entering the northern portion of Cook Inlet. It appears that a relatively few discrete sites exist within upper Cook Inlet which are very important in terms of feeding habitat for the Cook Inlet stock of beluga whales. Alaska Natives attribute this early movement into the upper Inlet to whales following the whitefish migration (Huntington, 1999). Beluga whales congregate at the mouths of several larger river systems during early spring, feeding on eulachon, salmon smolt, and adult salmon. The beluga whales typically form several large groups during this period, and may reside in and near the Susitna River, the Little Susitna River, Turnagain Arm, and several streams to the west of the Susitna River. Beluga whales may ascend these river systems: Native hunters report belugas once reached Beluga Lake from the Beluga River, and belugas are often seen well upstream in the Kenai and Susitna Rivers. By the end of June the beluga whales may disperse throughout much of the upper Inlet. Important feeding and concentration areas at this time include the Eagle River estuary, Chikaloon River mouth, and Ship Creek mouth, as well as the sites used earlier in the spring.

A satellite tag was placed on a beluga whale captured near the mouth of the Little Susitna River in late May of 1999. This adult male was subsequently tracked over the next three months, signals from the tag ended on September 17. This animal remained in the upper Inlet during this entire period, and was observed within a large group of about 90-100 beluga whales at the mouth of the Little Susitna River from late May to mid June. The whale remained off the Susitna River and in Knik and Turnagain Arms until the tag quit transmitting.

The whales begin to leave the upper Inlet sometime in mid to late October, although small groups or individual animals are seen near Anchorage well into November. The winter distribution of this stock is poorly understood. Calkins (1983) postulated the whales leave the inlet entirely, particularly during heavy ice years. Dedicated survey efforts by MMS in the winter 1997 found few belugas within Cook Inlet. Ten aerial surveys between February 12 and March 14, 1997, resulted in several beluga whale sightings in Cook Inlet. The number of animals represented by these sightings is not reported.

Sightings of beluga whales outside of Cook Inlet (but in the northern Gulf of Alaska region) further indicate that the CI beluga whale stock ranges well beyond the inlet in the winter.

These sightings include sporadic observations of beluga whales near Yakutat, 640 km southeast of Cook Inlet. Twenty one adult and five juvenile beluga whales were seen near Yakutat in May of 1976 (Fiscus, Brahan, and Mercer, 1976). The MMS 1997 winter surveys observed 10 beluga whales off Hubbard Glacier near Yakutat, and the U.S. Coast Guard reported sighting 10 to 11 beluga whales there in November 1998. It is possible these beluga whales are part of the Cook Inlet stock that move out of the inlet in winter and return again in spring. Consiglieri and Braham (1982) reported annual observations of these whales by local fishermen. Calkins (1986), however, found these observations to be unsupported and believed the Yakutat sightings to be belugas from the Cook Inlet stock.

Sightings have also occurred in Shelikof Strait, Kodiak Island, Resurrection Bay and Prince William Sound. However, sightings in these locations are rare and involve relatively few animals. For example, a single beluga whale was observed in Aialik Bay near Seward in 1988 (Morris, 1992). Another single whale was reportedly seen near Montague Strait in 1978 (Harrison and Hall, 1978) and in St. Matthew's Bay in 1998 (D. Janka, Pers. Comm.). An exception is a report in Calkins (1986) of approximately 200 beluga whales observed in July 1983 in western Prince William Sound near Knight Island.

3.1.4 Feeding Behavior: Beluga whales are opportunistic feeders, and are known to prey on a wide variety of animals. They eat octopus, squid, crabs, shrimp, clams, mussels, snails, sandworms, and fish such as capelin, cod, herring, smelt, flounder, sole, sculpin, lamprey, and salmon (Perez, 1990; Haley, 1986; Klinkhart, 1966). Cook Inlet Natives also report that CI beluga whales feed on freshwater fish; lingcod, trout, whitefish, northern pike, and grayling (Huntington, 1999), and on tomcod during the spring (Fay et al., 1984). Calkins (1989) reported recovering 13 fish tags from the stomach of an adult beluga whale found dead in Turnagain Arm. These salmon had been tagged in the Susitna River, as much as 80 miles upriver of Cook Inlet. In captivity, beluga whales may consume 2.5-3 percent of their body weight daily, or 40-60 pounds. Wild beluga populations, faced with an irregular supply of food, may easily exceed these amounts while feeding on concentrations of eulachon and salmon. Cook Inlet beluga hunters report one whale having nineteen adult king salmon in its stomach (Huntington, 1999).

The smelt-like eulachon (also named hooligan and candle fish) is undoubtedly a very important food source for beluga whales in Cook Inlet. Eulachon may contain as much as 21% oil (total lipids) (Payne et al., 1999). These fish enter the upper Inlet in May. Two major spawning migrations of eulachon occur in the

Susitna River, in May and July. The early run is estimated at several hundred thousand fish and the later run at several millions (Calkins, 1989). Stomachs of beluga whales harvested from the Susitna area in spring have been filled with eulachon.

Salmon smolt are also an important prey item, as large numbers leave these river systems in spring and summer and are available to the belugas. Pink and chum salmon are most numerous during June and July, and all five species of Pacific salmon are present in the upper Inlet. Interestingly, a 1993 smolt survey of the upper Inlet found juvenile herring the second-most abundant fish species collected (Moulton, 1994).

Dense concentrations of prey appear essential to beluga feeding behavior. Hazard (1988) reports belugas were more successful in feeding in rivers where prey were concentrated than in bays where prey were dispersed. Frost et al. (1983) noted that belugas in Bristol Bay feed at the mouth of the Snake River, where salmon runs are smaller than in other rivers in Bristol Bay. However, the mouth of the Snake River is shallower and, hence, may concentrate the prey.

3.1.5 Natural Mortality: Three sources of natural mortality are considered in this section: strandings, predation and disease.

3.1.5.1 Strandings: Beluga whales commonly strand in upper Cook Inlet. NMFS estimates that over 590 whales have stranded (both individual and mass strandings)in upper Cook Inlet since 1988[1]. Mass strandings have been most common along Turnagain Arm, often coinciding with extreme tidal fluctuations ("spring tides"). These mass strandings involve both adult and juvenile beluga whales. NMFS has responded to such events since 1989 and has observed the stranded animals usually swim away with the returning tide. However, mortalities have also been observed. A 1996 mass stranding of approximately 60 beluga whales in Turnagain Arm resulted in the death of four adult whales. Five adult beluga whales died from another stranding of approximately 70 whales in August of 1999.

3.1.5.2 Predation: The number of killer whales visiting the upper inlet appears to be small. However, they may prey upon CI beluga whales. NMFS has received reports of killer whales in Turnagain and Knik Arms, between Fire Island and Tyonek, and near

[1]This estimate includes 44 beluga whale carcasses found along the shoreline which had been harvested for subsistence.

the mouth of the Susitna River. Native hunters have recently reported killer whales along the tide rip that extends from Fire Island to Tyonek (Huntington, 1999) and in Kachemak Bay.

No quantitative data exist on the level of removals from this population due to killer whale predation or its impact; however, killer whale pods prey selectively on salmon or marine mammals, including beluga whales, in Cook Inlet. During a killer whale stranding in Turnagain Arm in August 1993, one observer reported that a killer whale regurgitated pieces of beluga flesh. A potential dietary shift may account for some of the more recent sightings of killer whales in Cook Inlet.

On the other hand, pods of killer whales also feed on salmon, a prey of beluga whales. Therefore, seeing killer whales near beluga whales in the inlet does not necessarily imply that they are searching for beluga whales.

Assessing the impact of predation by killer whales on CI beluga whales is difficult. Anecdotal reports often highlight the more sensational, mortalities on beluga whales due to killer whales, thereby overemphasizing their impact. Further, these reports are from the early 1980s when beluga whales were more abundant. Consequently, they are of minimal value in evaluating current impacts to the population of beluga whales in Cook Inlet.

3.1.5.3 Disease: Bacterial infection of the respiratory tract is one of the most common diseases encountered in marine mammals. Bacterial pneumonia, either alone or in conjunction with parasitic infection, is a common cause of beach stranding and death (Howard et al., 1983). From 1983 to 1990, 33 percent of stranded beluga whales in the St. Lawrence estuary (n = 45 sampled) were affected by pneumonia (Martineau et al., 1994). One beluga whale apparently died from the rupture of an "aneurysm of the pulmonary artery associated with verminous pneumonia" (Martineau et al., 1986).

Beluga whales appear relatively free of ectoparasites, although both the whale louse, Cyamus sp., and acorn barnacles, Coronula reginae, are recorded from stocks outside of Alaska (Klinkhart, 1966). Endoparasitic infestations are more common. An acanthocephale, Coryosoma sp., was identified in beluga whales, and Pharurus oserkaiae has been found in Alaskan beluga whales. Anisakis simplex is also recorded from belugas in eastern Canada (Klinkhart, 1966). Results of necropsies from CI beluga whales have found heavy infestations in adult whales. Approximately 90 percent of CI beluga whales examined have had kidneys parasitized by the nematode Crassicauda giliakiana. This parasite occurs in other cetaceans, such as Cuvier’s beaked whale, but has not been

extensively reported in other Alaskan beluga stocks. Although extensive damage and replacement to tissues has been associated with this infection, it is unclear whether this results in functional damage to the kidney (Burek 1999a).

Parasites of the stomach (most likely Contracecum or Anisakis) are often present in CI beluga whales. These infestations have not, however, been considered to be extensive enough to have caused clinical signs. Also recorded within muscle tissues of CI beluga whales is Sarcocystis sp. The encysted (muscle) phase of this organism is thought to be benign; however, acute infections can result in tissue degeneration leading to lameness or death (Burek, 1999b).

The arctic form of Trichenella spiralis (a parasitic nematode) is known to infect many northern species including polar bears, walrus, and to a lesser extent ringed seal and beluga whales (Rausch, 1970). The literature on "arctic trichinosis" is dominated by reports of periodic outbreaks among Native people (Margolis et al., 1979). The effect of the organism on the host marine mammal is not known (Geraci and St. Aubin, 1987). Trichenella has not been recorded within the CI stock of beluga whales.

3.2 Cultural Environment: History of Beluga Whale Hunting in Cook Inlet

Throughout the Cook Inlet basin and specifically in Knik Arm and the Kenai River, archeological research has found items both from the Dena'ina Athabaskan and historic Eskimo cultures. The Pacific Eskimos occupied Cook Inlet as late as between A.D. 1000 - 1500 (Ackerman, 1975). The Dena'ina[2], also called the Tanaina, is one of the Athabaskan peoples of Alaska that live in the Cook Inlet region. The Dena'ina moved to the Cook Inlet area to escape the harsher extremes of the interior (Chandonnet, 1985).

Historically the Dena'ina Indians lived in an area that extended around Cook Inlet and inland, west to Iliamna Lake and Lake Clark, north to the Devil's Canyon in the Susitna River and the Matanuska River drainage, east to the Kenai Mountains, and south to Kachemak Bay. Unique among Alaskan Athabaskan people, the

[2]Russian scholars recorded the word *Dena'ina* with an initial "t," often spelling it "Tnana". Cornelius Osgood used the spelling "Tanaina" in his 1937 ethnology. The spelling *Dena'ina* is the modern orthography (the apostrophe is the glottal stop). This word means 'the people' and is cognate with the Navajo term *dine*' of the same meaning (Ackerman, 1975).

Dena’ina live along the Pacific Ocean and exploited the marine resources, as well as lake, riverine, and interior environments. The good climate and constant supply of adequate food made it possible for the Dena’ina to live in semi-sedentary villages throughout the Cook Inlet region.

The Dena’ina seasonally crossed the Inlet in skin covered single- or double-holed kayaks and the larger open boat, the *badi*, that resembled the Eskimo *umiak*. In Knik and Turnagain Arms, with the dangerous bore tides, the Dena’ina rarely traveled far by boat. The Dena’ina originally learned how to make and use both types of boats from their Eskimo neighbors (Ackerman, 1975).

Cook Inlet offered a rich supply of marine resources such as beluga whales, sea lions, seals, porpoise, and sea otter that fed on salmon, eulachon, herring, cod, halibut, and shellfish. The Dena’ina did not hunt the larger whales, as it was said that they lacked the proper magic to kill them (Ackerman, 1975). Instead this meat was obtained by trade. However, if they found a beached whale, it was used.

3.2.1 Beluga Whale Use: The beluga whale provided meat and oil to the hunter’s family and dogs. The meat was generally cut into strips and dried. The blubber was rendered into oil and put into containers with lids for the winter. Their sinews were made into ropes and string for bow, because the beluga sinew string is strong (Pete, 1987). Their stomachs were used as oil containers. Beluga (and bear) intestines were made into gut parkas for wet weather gear (Ackerman, 1975). Belugas were an important food source for the upper and outer Inlet Dena’ina, especially before the moose arrived in the Inlet region in the late 1800's (Kari and Kari, 1982). As important as the meat was, whale blubber and oil were of even greater economic importance (Fitzhugh and Crowell, 1988).

The blubber from the beluga whale was rendered into oil to store other foods or used in lamps for heat and light. Kalifornsky (1991) reported that cooked clams were placed in a beluga stomach and covered with oil to preserve the clams over the winter. The clams were then washed in hot water and cooked during the winter months. The meat is eaten fresh, dried, roasted, boiled, and ground. The skin and a layer of fat (*kimmuq*, or muktuk) are eaten raw, pickled, canned, or boiled. The ivory teeth are used in a variety of functions and were important trade items (Fitzhugh and Crowell, 1988). Whale bone was used in Native art (e.g., masks) and handicraft work.

3.2.2 Historical Methods of Hunting Beluga Whales in Cook Inlet: The *Susi Kaq* "sand island mouth" (the Susitna Delta area, including Big Island and the west channel of the lower Susitna)(Pete 1987) was an important spring camping area on the Inlet at the mouth of the Susitna River. Dena'ina gathered to hunt beluga, ducks, and geese, to fish for salmon and eulachon, and to trade.

Beluga whales were hunted between May and August at the mouths of the rivers and streams (Pete, 1987). It required several hunters to successfully harvest the beluga whale. The upper Inlet Dena'ina method of catching the small white beluga seems to be unique in North America, not borrowed from the Eskimo or Alutiiq people (Pete, 1987). The Dena'ina used the tidal flats in the Susitna Delta to hunt beluga whales. According to Pete's (1987) description, the hunters erected a *yuyqul* (beluga spearing trees), which are dead spruce trees, root side up, in the mud during a low tide. Each spruce tree had many ropes extending from it and five or more people would pull on each rope to lift the tree up. The sinew ropes were then secured to stakes. The hunters climbed into the "nest" formed by the tree roots (Fall *et al*., 1984) to wait for the beluga that would swim by with the incoming tide. The hunters had harpoons fitted with a toggle point and attached with braided sinew ropes (about 25 fathoms long) to floats (usually inflated sealskin). Similar gear was used to hunt Steller sea lions at Kachemak Bay. During the incoming tide, the belugas would chase the salmon and the hunters would strike the beluga many times as it came by (Pete, 1987). The struck whales with the attached floats were pursued by the hunters in boats until the whales tired and could be killed by a hunter with a boneheaded spear. The whales were then taken to shore and butchered.

With the introduction of firearms around the turn of the century, the Dena'ina abandoned the *yuyqul* and weir methods for beluga whale hunting, and used boats and firearms to shoot beluga whales at the shallow river mouths. The three-man skin kayaks and baidarkas were used on the Inlet, as late as the turn of this century, to hunt seal, beluga whales, ducks and to collect clams (Kalifornsky, 1991).

Beluga whales were hunted in Kachemak Bay, at Halibut Cove in the 1920's (Stanek, 1996). Hunters would line up along the point and shoot the belugas and seals as they swam in with the tide. The animals were retrieved from the lagoon where they floated, from the beaches where they stranded, and from the shallow waters where they sank. Kalifornsky (1991) reports that beluga whales were regularly hunted at the mouth of the Kenai River before

1929.

Stanek (1996) reports that the residents of Tyonek historically used another method to hunt beluga whales. A fence or weir was constructed at the Beluga River and a movable dam made of poles placed in "Takasitna Harbor," which may have been Tuxedni Bay. The beluga whales and seals chased the fish upstream with the incoming tide. The movable poles were then placed to trap the animals behind these structures with the outgoing tide and they were then harvested.

Prior to the 1940's, beluga whales were a major part of Tyonek's diet, with Tyonek hunting six or seven whales annually in the 1930's and 1940's (Pete, 1987). Between the late 1940's and 1978, with a growing number of moose in the area, there was little interest in beluga whales or any other marine mammal hunting. However, since 1979, the beluga whale hunt has been re-established in Tyonek. The meat and blubber are shared throughout the village (Fall *et al.*, 1984).

3.2.3 <u>Contemporary Beluga Whale Hunting</u>: In the late 1700's there were about 5,000 or more people around the Cook Inlet area (Ackerman, 1975). Today there are only about 1,000 people of Dena'ina ancestry living in the villages of Eklutna, Knik, Kenai, Seldovia, Tyonek, Pedro Bay, Nondalton, Lime Village, and Stony River, as well as in Anchorage. About 60 percent of Alaska's population lives within the traditional lands of the Dena'ina (Matanuska Valley, Anchorage Municipality, and the Kenai Peninsula). In this dynamic region, about 30,000 people are Alaska Natives.

The Cook Inlet marine mammal hunters who hunt beluga whales consist of (1) the Dena'ina of Tyonek, who continue their historical hunting of belugas near their village, (2) hunters who have lived in other parts of Alaska, but have made the Cook Inlet area their home, and (3) visitors to the Cook Inlet area from other parts of the state. As the participants increase in these hunter groups, the demand for CI beluga whale grew. However, the actual number of CI beluga whale hunters is unknown due to the dispersal of hunting "communities" and hunting locations. The number of Eskimo, or non-area, hunters greatly exceeds that of the Cook Inlet tribal hunters, although no detailed estimates exist. NMFS believes there were approximately 16 Eskimo whaling crews in 1997. The CIMMC has estimated the number of people currently hunting beluga whales to be approximately 50. It is common for whalers to be accompanied by friends and relatives while on hunting trips. Of the six Cook Inlet Treaty Tribes and villages, only the Native village of Tyonek has regularly harvested beluga whales in recent history. Tyonek's harvest of

beluga whales has been modest; residents there report about six to seven whales were taken annually during the 1930's and 1940's, but very little beluga hunting occurred between the 1940's and the late 1970's (Stanek, 1994). About three were taken in 1979, and one whale was harvested annually between 1981 and 1983 (ADFG, undated). Recently, Tyonek's harvest has averaged one to two beluga whales each year. The Beluga and Theodore Rivers are major hunting areas for this village.

Beluga whales are now hunted with high powered rifles from April through October. Most of the hunting occurs between May and August at the Susitna Delta area (Little Susitna River, west to the Beluga River). Hunters use small motorboats launched from Anchorage to access these camps and hunt in or near the river mouths. Crews are often small, two to four persons, although hunters may also hunt in groups. Kachemak Bay is usually hunted in April and May, especially if the ice has not yet left the upper Inlet. Knik Arm and Chickaloon River are occasionally hunted in late summer and early fall, through October. The hunters always collect the muktuk. Sometimes they collect the meat and blubber for food and bones and teeth for handicrafts. The hunters wait at camp for the whales to enter shallow water or chase whales already in the shallow waters. The dark, murky waters of upper Cook Inlet prevent detection of submerged whales, so the hunters follow the beluga whale's "covenough," or, wake, that is created by the whale in shallow water. As the whale breaches, the hunters generally shoot, then harpoon immediately after, or harpoon first and then shoot. When the whale is dead, the hunters attach a line through the lower mandible or around its tail to tow it to shore.

The flippers and tail are considered a delicacy by some people, and are generally removed first. The muktuk is taken from the whale in large strips, about 24" to 36" in length and 18' to 24" in width. The blubber is removed in square chunks. If any meat is collected, it is the back strap and ribs. The remaining skeleton, meat, and organs are often left on site, or if near a village (like Tyonek), these parts may be used for dog food. In Tyonek, the muktuk, blubber, and meat are shared throughout the village. In Anchorage, portions are kept and shared with family and friends. CI beluga whale parts have been sold in Anchorage to Alaska Native food stores, sold within the Anchorage Native community, and sold to Alaska Natives who live outside the Anchorage

With the rise of alternative means of subsistence, reliance on whales as a primary food source diminished, but the importance of whaling in economic and cultural terms never disappeared (Fitzhugh and Crowell, 1988). Alaska Natives continue to share

the meat and blubber in traditional patterns that reaffirm social ties and provide a strong sense of ethnic identity (Fitzhugh and Crowell, 1988). The use of the beluga whale and other wild resources continues to be economically, nutritionally, and culturally valuable to the Dena'ina and other Alaska Natives in the Cook Inlet area.

The village of Tyonek has customary local rules which guide their beluga hunters. These rules commonly guide aspects of the hunt such as seasons, hunting areas, harvest methods, the social group hunting, selection of types of animals, processing of animals, uses of parts of the animals, and distribution of products.

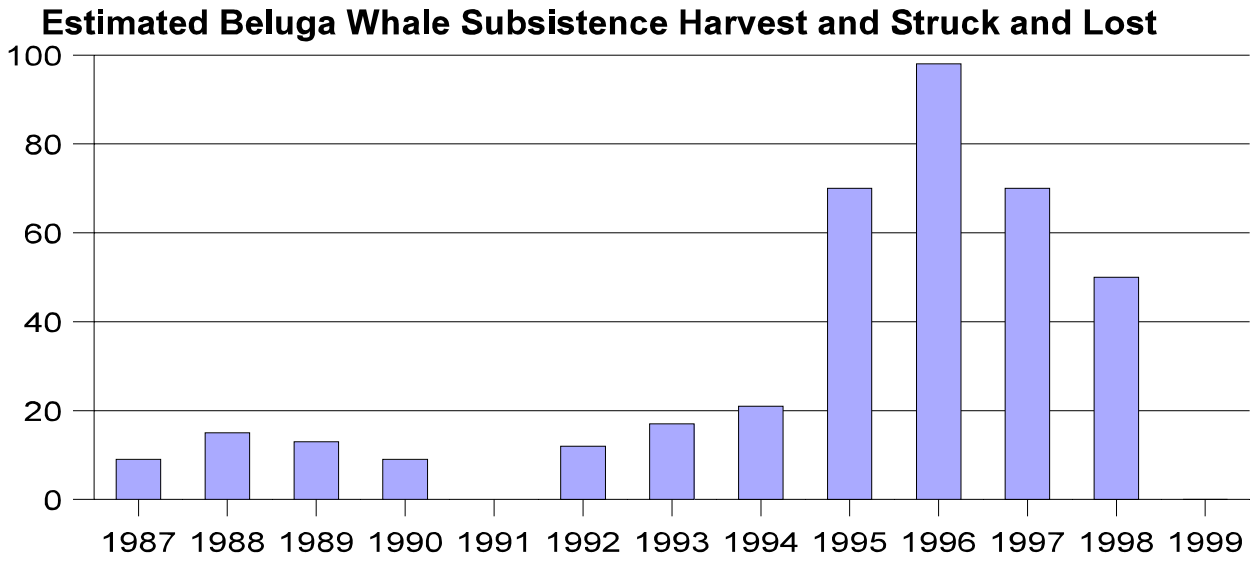
Recently, a significant portion of the hunters that hunt within Cook Inlet are not originally from the area, although they hunted beluga whales in their villages and continued to hunt belugas when they moved to the Cook Inlet area (Anchorage, Matanuska Valley, or Kenai Peninsula). There is some development of a "community" from similar geographic areas, but most hunters are independent. Other hunters, who are not local residents, but regularly visit the CI area, hunt with family or friends in Cook Inlet where belugas are available all season

Historically, subsistence harvest levels of CI beluga whales have been largely unreported. Estimated harvest for the years 1987-1999 are presented in the figure. The sources of these data include estimates by ADFG, reports from CIMMC, and data compiled by NMFS based on reports from hunters and direct observations of harvested whales. The large difference in the number of beluga whales harvested before and after 1995 is due, in large part, to improved efforts in reporting and the application of a correction factor for struck and lost whales. No whales were reported harvested in 1999 as a result of the moratorium created by the May 1999 amendment to the MMPA.

The 1995-1998 estimates include animals struck, but lost, using a ratio of one beluga whale lost for each landed. Struck and loss estimates may be highly variable, although CIMMC (1997) reported that this may be between one and two for each whale landed. Data compiled by CIMMC for the 1995 harvest estimated strike and loss at less than 1:1 (44 CI beluga whales were landed and 26 were struck and lost) (CIMMC, 1996). NMFS estimates that this harvest averaged 77 whales taken annually between 1995 and 1997. At such a level of harvest, this stock could be reduced by 50 percent of its current level within five years.

It is not uncommon for beluga harvest efficiencies to be low. Native hunters, themselves, reported an increase in the number of struck and lost beluga whales, evidenced by whales observed

washed up on shore along the west side of the Inlet (Huntington, 1999). An efficient harvest in Cook Inlet is confounded by the turbidity of the water, large tidal fluctuations and currents.



4.0 ENVIRONMENTAL CONSEQUENCES

This chapter evaluates the probable environmental, biological, cultural, economic, and social consequences of the presented alternatives. Generally, the direct biological consequences of the alternatives concern the impacts of harvest on the recovery of the CI beluga whales. Cultural and social impacts or consequences would be realized within local Alaskan Native communities who are dependent on subsistence resources. There are no apparent consequences of either of the alternatives on the physical environment of Cook Inlet, or on activities other than hunting, that are ongoing in Cook Inlet.

Alternative 2 provides for a strike which would require a co-management agreement to be signed between NMFS and an ANO. NMFS has drafted such an agreement with CIMMC. In the process of negotiating the agreement, both parties believe that beneficial results to the efficiency of the harvest have been achieved through the development and adoption of guidelines or requirements intended to reduce struck and loss rate, avoid wasteful practices, and minimize interference with other uses of the Inlet.

Co-management of Alaska's marine mammals has generally proven to be very successful in allowing self-determination among Native Alaskans in their subsistence harvest practices while allowing for the necessary conservation of important stocks. The endangered bowhead whale is harvested under such an agreement between the Alaska Eskimo Whaling Commission (AEWC) and NOAA. Under that agreement, the bowhead whale harvest has been successfully harvested under the direction of the AEWC, and the bowhead stock has increased steadily. The AEWC is responsible for monitoring and reporting on the harvest, as well as enforcing certain actions within their membership, while Federal authority is retained.

4.1 Biological Model of Effects of Harvest on the Recovery Time of CI Beluga Whales

NMFS evaluate the effects of the two harvest alternative presented in this assessment using a generalized logistics model. Model parameters included the following: carrying capacity = 1,300, Maximum Net Productivity Level = 780, and Maximum Net Productivity Rate = 4%. The starting population size was 357, which was estimated abundance in 1999. Using these simulations, NMFS compared the time to recovery (abundance greater than 780 whales) when no harvest was allowed and when the harvest of a

single whale was authorized in 2000. The time to recovery without harvest was 22 years. The simulation in which harvest was allowed also exceeded 780 whales in 22 years, and the ending abundance level was about 1-2 whales lower when the 2000 harvest was included. Such a difference in results of these simulations indicates that the results of the harvest would be negligible on the CI beluga whale stock.

4.2 Evaluation of Alternative 1 - Status Quo or No Action

NMFS would not enter into an agreement with an ANO under Alternative 1. Therefore, under the requirements of Public Law 106-31, there could be no harvest on the CI stock of beluga whales. This would set up a de facto moratorium on the stock during 2000. Human-caused mortalities would be eliminated, or significantly reduced, in 2000. The stock's recovery would be affected only by natural mortality.

4.2.1 Biological Consequences

Alternative 1 has few direct biological effects. A harvest would not occur and whales would not be removed from this population by hunting in 2000. Several indirect biological effects have been identified as a possible result of selecting Alternative 1. The lack of CI beluga whales taken in subsistence harvest by Alaskan Natives might place additional hunting pressure on other marine mammal stocks in Cook Inlet. Of these other marine mammals, only the harbor seal occurs regularly in upper Cook Inlet and increased harvest for subsistence uses would be expected. Similarly, there may be increased pressure on the harvest of beluga whales from other stocks throughout Alaska. The stock considered most likely as an alternative source of beluga whale muktuk for those living in the Cook Inlet region would be from Bristol Bay because of its proximity and ease of shipping to Anchorage. The muktuk from one beluga whale harvested in Bristol Bay was delivered to the Anchorage Native community in 1999. That whale had been incidentally caught in a fishing net and was sent to a local hunter who then distributed it to Alaskan Natives in both Tyonek and Anchorage. In another instance, muktuk from a beluga whale taken in October 1999 on the Naknek River was subsequently sold in Anchorage. Some level of importation of beluga whale products into the Cook Inlet region may be expected. The four other Alaskan beluga stocks are currently healthy and could support an additional small level of harvest. However, the subsistence use of these stocks is managed through an agreement between NMFS and the Alaska Beluga Whale Committee, who would address any management or village concerns associated with this trade.

Without a beluga whale harvest additional subsistence take of waterfowl and fish in the region may occur. However, it is difficult to predict whether or not there would be an increased harvest of other subsistence species. Traditional Native foods consist of a variety of things that are not necessarily equivalent on a pound-for-pound basis (i.e, beluga muktuk would not be replaced by a pound of fish or seal). Therefore, there may be little interest among hunters in harvesting more of these other resources than they currently do. Also, the amount of these resources harvested is determined in part by their availability, which is not expected to change.

Despite the loss of the opportunity to harvest beluga whales, Alaskan Natives would be expected to continue to utilize Cook Inlet for purposes of subsistence hunting, fishing, and gathering. These activities may include large game hunting (moose and bear), hunting of fur bearing animals, waterfowl hunting, marine mammal hunting (mainly harbor seal), fishing for salmon and eulachon (smelt), and plant and berry picking. The harvest and use of these foods are activities with significant social and cultural meaning as well as having economic importance.

4.2.2 Social and Cultural Consequences

Alternative 1 is expected to impact traditional Native culture in at least two ways. Alaskan Natives who have recently participated in the hunting of CI beluga whales would not have the opportunity to harvest this resource. Although this action concerns only the 2000 harvest, Native hunters have expressed their belief that traditional hunting skills and knowledge must be passed on first-hand and that the tradition would die if no hunting occurs for many years. This would be the second year in a row with no take of belugas, as no harvest of occurred in 1999 due to a voluntary stand-down by Native hunters and provisions of Pub. L. 106-31. Social standing within the Native community is based, in part, on the station of an individual. Whaling captains, and those who secure and distribute Native foods, are highly regarded. Those hunters who have relied on beluga whales as part of their annual Native food source, or for money through sale of edible portions, would be adversely affected by this alternative. The cultural aspects of this harvest would continue to erode under this alternative, if the traditional skills and knowledge associated with this hunt are lost through time. Without direct experience in this harvest, these skills may not be taught and passed on with the consequence that when hunting resumed after recovery the low skill levels of the hunters could result in inefficient and wasteful harvest practices.

4.3 Evaluation of Alternative 2

NMFS would establish a harvest level at one (1) strike for the year 2000 under Alternative 2. The agreement authorized under this alternative would expire at the end of 2000.

4.3.1 Biological Consequences

The direct biological consequence of this alternative would be the removal of one (1) adult whale from this population. With this harvest, the impact would be negligible and would not delay the rate at which the CI beluga whale stock would recover. Removing one whale as a result of a subsistence harvest would still result in a 22 year period for the stock to recover to the lower level of OSP. Therefore, the biological consequences would not be distinguishable from the no-harvest regime in Alternative 1.

4.3.2 Social and Cultural Consequences

A few Alaskan Natives who have recently participated in the hunting of CI beluga whales would have the opportunity to harvest this resource, while additional Alaskan Natives would benefit as the beluga is shared with others under Alternative 2. Native hunters have expressed their belief that the skills, cultural values, and knowledge associated with this harvest must be passed on first-hand to younger generations, and that the tradition would die if no hunting occurs for many years.

Those hunters who have relied on the beluga for money would be adversely impacted by this alternative, as the agreement prohibits such sales. The intent of this harvest is to enrich and maintain the cultural tradition of hunting. The traditional skills and knowledge associated with this hunt would not be lost, and direct experience in this harvest would continue to be taught and passed on.

4.4 Impacts on Endangered or Threatened Species

The ESA provides for the conservation of endangered and threatened species of fish, wildlife, and plants. The program is administered jointly by NMFS for most marine species, and the US Fish and Wildlife Service (FWS) for terrestrial and freshwater species.

The ESA procedure for identifying or listing imperiled species involves a two-tiered process, classifying species as either threatened or endangered, based on the biological health of a

species. Threatened species are those likely to become endangered in the foreseeable future [16 U.S.C. § 1532(20)]. Endangered species are those in danger of becoming extinct throughout all or a significant portion of their range [16 U.S.C. § 1532(20)]. The Secretary of Commerce, acting through NMFS, is authorized to list marine mammal and fish species. The Secretary of the Interior, acting through the FWS, is authorized to list all other organisms. Species listed as threatened or endangered under the ESA that occur in waters off Alaska are presented in Table 1.

In addition to listing species under the ESA, the critical habitat of a newly listed species must be designated concurrent with its listing to the maximum extent prudent and determinable [16 U.S.C. § 1533(b)(1)(A)]. The ESA defines critical habitat as those specific areas that are essential to the conservation of a listed species and that may be in need of special consideration. The primary benefit of critical habitat designation is that it informs Federal agencies that listed species are dependent upon these areas for their continued existence, and that consultation with NMFS on any Federal action that may affect these areas is required.

Table 1. Species currently listed as endangered or threatened under the ESA and occurring in waters off Alaska

Common Name	Scientific Name	ESA Status
Northern Right Whale	*Balaena glacialis*	Endangered
Bowhead Whale [1]	*Balaena mysticetus*	Endangered
Sei Whale	*Balaenoptera borealis*	Endangered
Blue Whale	*Balaenoptera musculus*	Endangered
Fin Whale	*Balaenoptera physalus*	Endangered
Humpback Whale	*Megaptera novaeangliae*	Endangered
Sperm Whale	*Physeter macrocephalus*	Endangered
Snake River Sockeye Salmon	*Onchorynchus nerka*	Endangered
Short-tailed Albatross	*Phoebastria albatrus*	Endangered
Steller Sea Lion	*Eumetopias jubatus*	Endangered and Threatened [2]
Snake River Fall Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Snake River Spring/Summer Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Puget Sound Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Lower Columbia River Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Upper Willamette River Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Upper Columbia River Spring Chinook Salmon	*Onchorynchus tshawytscha*	Endangered
Upper Columbia River Steelhead	*Onchorynchus mykiss*	Endangered
Snake River Basin Steelhead	*Onchorynchus mykiss*	Threatened

Lower Columbia River Steelhead	*Onchorynchus mykiss*	Threatened
Upper Willamette River Steelhead	*Onchorynchus mykiss*	Threatened
Middle Columbia River Steelhead	*Onchorynchus mykiss*	Threatened
Spectacled Eider	*Somateria fishcheri*	Threatened
Steller's Eider	*Polysticta stelleri*	Threatened

[1] The bowhead whale is present in the Bering, Chukchi, and Beaufort Seas.
[2] Steller sea lions are listed as endangered west of Cape Suckling and threatened east of Cape Suckling.

4.5 Coastal Zone Management Act of 1972 (CZMA)

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 307(c)(1) of the CZMA and its implementing regulations.

4.6. 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 proposed regulation 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 proposed 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." This proposed regulation is not considered to have a significant economic effect because it does not result in any of the impacts described above.

4.6.1 Non-consumptive Resource Use

While no market exists within which CI beluga whales 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 Alaskan 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, CI beluga whales are flourishing in their natural environment.

A substantial body of 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 beluga whales in Cook Inlet; society further “values” the *option* it retains through the continued existence of the resource for future access to the CI beluga whale population; and society places “value” on providing future generations the opportunity to enjoy and benefit from this resource. These estimates are 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., beluga whales), is a complex but

technically feasible task. However, in the current situation, an empirical estimation of these values is unnecessary, because the MMPA and the ESA implicitly assumes 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 CI beluga whales do exist. Therefore, the effect of implementing the proposed action is likely to produce an overall net social and economic benefit.

4.7 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, 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 IRFA, 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 group, 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 proposed rulemaking does not have negative economic impacts to small entities as defined and, as such, an Initial Regulatory Flexibility Analysis, pursuant to 5 USC 603, is not required.

5.0 CONSULTATION AND COORDINATION

This following groups or agencies have been consulted in the preparation of this EA.

Cook Inlet Marine Mammal Council
Native Village of Tyonek
National Marine Mammal Laboratory
Alaska Beluga Whale Committee
Alaska Department of Fish and Game
U.S. Army Corps of Engineers

The development of the agreement is the product of many discussions, public meetings and coordination between NMFS and CIMMC since the first public review of this issue which occurred in Anchorage, Alaska, March 1999. The agreement had many drafts and the final product is the result of review by CIMMC, and legal counsel from both parties.

6.0 CONCLUSIONS: FINDING OF NO SIGNIFICANT IMPACT

The National Marine Fisheries Service proposes to enter into an agreement with an ANO authorizing the take of one beluga whale during 2000. This Environmental Assessment has been prepared to evaluate the environmental impacts of this proposal and to provide sufficient evidence to determine the level of significance of this action. Based on this analyses, NMFS has determined that the harvest of one whale during the year 2000, as specified in the co-management agreement, neither significantly impacts the overall quality of the human environment or cause any adverse impacts on any wildlife species listed under the Endangered Species Act (ESA) or MMPA. Therefore, NMFS has determined that preparation of an environmental impact statement for the proposed action is not required by Section 102 (2) (C) of NEPA or its implementing regulations.

_____ July 13, 2000

Assistant Administrator for Fisheries — Date

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8.0 LITERATURE CITED

Ackerman, R.E. 1975. The Kenaitze people. Indian Tribal Series, Phoenix, Arizona.

Alaska Department of Fish and Game (ADFG). Undated. The use of fish and wildlife resources in Tyonek, Alaska. Tech. Paper No. 105. Division of Subsistence. 8 p.

Burek, Kathy, D.V.M. 1999a. Biopsy report of beluga whale: Case

No. 98V0581. NMFS, Anchorage, Alaska. 3p.

Burek, Kathy, D.V.M. 1999b. Biopsy report of beluga whale: Case No. 98V0579. NMFS, Anchorage, Alaska. 2p.

Burns, J.J., and G.A. Seaman. 1986. Investigations of belukha whales in coastal waters of western and northern Alaska. II. Biology and ecology. U.S. Dept. Commer., NOAA, OCSEAP Final Rep. 56(1988): 221-357.

Calkins, Donald G. 1983. Susitna hydroelectric project phase II annual report: big game studies. Vol. IX, belukha whale. ADFG, Anchorage, Alaska. 15p.

Calkins, Donald G. 1984. Susitna hydroelectric project final report: volume IX, beluga whale. ADFG Document No. 2328. 17p.

Calkins, Donald G. 1986. Marine mammals. *In*: The Gulf of Alaska physical environment and biological resources. D.W. Hood and S.T. Zimmerman, eds. OCS study, MMS 86-0095. pp. 527-558.

Calkins, Donald G. 1989. Status of belukha whales in Cook Inlet. *In*: Gulf of Alaska, Cook Inlet, and North Aleutian Basin information update meeting. L.E. Jarvela and L.K. Thorsteinson (Eds). Anchorage, Ak., Feb. 7-8, 1989. Anchorage, Ak.: USDOC, NOAA, OCSEAP, pp. 109-112.

Chandonnet, A. 1985. On the trail of Eklutna. User Friendly Press. Anchorage, Alaska.

Consiglieri, L.D., and H.W. Braham. 1982. Seasonal distribution and relative abundance of marine mammals in the Gulf of Alaska. Research Unit 68. NOAA, OCSEAP, Juneau. 212p.

Cook Inlet Marine Mammal Council. 1996. Native harvest and use of beluga in the upper Cook Inlet from July 1 through November 15, 1995. NMFS, Anchorage, Alaska. 3p.

Cook Inlet Marine Mammal Council. 1997. Native harvest and use of beluga in Cook Inlet from April throughout November 1996. NMFS, Anchorage, Alaska. 5p.

Fall, J.A., D.J. Foster, and R.T. Stanek. 1984. The use of fish and wildlife resources in Tyonek, Alaska. Alaska Department of Fish and Game, Division of Subsistence. Technical Paper Number 105.

Fay, J.A., D.J. Foster, and R.T. Stanek. 1984. The use of fish and wildlife resources in Tyonek, Alaska. ADFG, Div. Subsistence, Anchorage, Tech. Rep. Ser. 105. 219p.

Fiscus, C.H., H.W. Brahan, and R.W. Mercer. 1976. Seasonal distribution and relative abundance of marine mammals in the Gulf of Alaska. Process report, marine mammal division, NMFS, Seattle. 238p.

Fitzhugh, W.W. and A. Crowell. 1988. Crossroads of continents, cultures or Siberia and Alaska. Smithsonian Institution Press.

Frost, K.J., L.F. Lowry, and R.R. Nelson. 1983. Investigations of belukha whales in coastal waters of western and northern Alaska, 1982-1983: marking and tracking of whales in Bristol Bay. U.S. Dept. Commer., NOAA, OCSEAP Final Rep. 43(1986):461-585.

Geraci, J.R. and D.J. St. Aubin. 1987. Effects of parasites on marine mammals. International Journal for Parasitology 17(2):407-414.

Haley, Delphine. 1986. Marine Mammals. Second edition. Seattle: Pacific Search Press.

Harrison, C.S. and J.D. Hall. 1978. Alaskan distribution of the beluga whale, *Delphinapterus leucas*. Can. Field Nat. 92(3): 235-241.

Hazard, Katherine. 1988. Beluga whale, *Delphinapterus leucas*. *In*: Selected marine mammals of Alaska: species accounts with research and management recommendations. J.W. Lentfer, ed. Mar. Mammal Comm., Washington, D.C.

Hill, P.S., and D.P. DeMaster. 1998. Alaska marine mammal stock assessments, 1998. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-97, 166p.

Howard, E.B., J.O. Britt, G.K. Marsumoto, R. Itahara, and C.N. Nagano. 1983. Bacterial Diseases. Pp. 70-118 in: E.B. Howard (ed.) Pathology of marine mammal diseases, Vol. 1. CRC Press, Boca Raton, FL. 238p.

Huntington, Henry P. 1999. Traditional ecological knowledge of beluga whales in Cook Inlet, Alaska. Report to the Alaska Beluga Whale Committee and Cook Inlet Marine Mammal Council.

13p.

Kalifornsky, P. 1991. A Dena'ina Legacy (K'tl'egh'i sukdu), the collected writings of Peter Kalifornsky. Edited by J. Kari and A. Borass. Alaska Native Language Center. Fairbanks, Alaska.

Kari, J. and P.R. Kari. 1982. Dena'ina Elnena, Tanaina Country. Alaska Native Language Center, University of Alaska, Anchorage, Alaska.

Katona, Steven K., V. Rough, and D.T. Richardson. 1983. A field guide to the whales, porpoises and seals of the Gulf of Maine and eastern Canada. New York: Charles Scribner's Sons.

Klinkhart, E.G. 1966. The beluga whale in Alaska. Alaska Dept. Fish and Game. Fed. Aid in Wildlife Restoration Proj. Rep. Vol. VII. 11p.

Margolis, H.S., J.P. Middaugh, and R.D. Burgess. 1979. Arctic trichinosis: two Alaskan outbreaks from walrus meat. Journal of Infectious Diseases 139:102-105.

Martineau, D., S. De Guise, M. Fournier, L. Shugart, C. Girard, A. Lagace, and P. Beland. 1994. Pathology and toxicology of beluga whales from the St. Lawrence Estuary, Quebec, Canada. Past, present and future. The Science of the Total Environment 154:201-215.

Martineau, D., A. Lagace, P. Beland and C. Desjardins. 1986. Rupture of a dissecting aneurysm of the pulmonary trunk in a beluga whale (Delphinapterus leucas). Journal of Wildlife Disease 22(2):289-294.

Minerals Management Service. 1996. Cook Inlet planning area oil and gas lease sale 149. Final Environmental Impact Statement. U.S. Dept. Int. Alaska OCS Region.

Minerals Management Service. 1999. Distribution of Cook Inlet beluga whales (Delphinapterus leucas) in winter. U.S. Dept. Int. Alaska OCS Region. OCS Study MMS 99-0024. 30p.

Moore, Sue. E., D.J. Rugh, K.W. Shelden, and B.A. Mahoney. 1999. Beluga whale habitat in Cook Inlet, Alaska. Unpub. Report National Marine Mammal Laboratory, NMFS., Seattle, Washington.

Morris, Ronald J. 1992. Status report on Cook Inlet belugas (Delphinapterus leucas). NOAA, NMFS. Anchorage, Alaska. 22p.

Moulton, Lawrence L. 1994. 1993 northern Cook Inlet smolt studies. Draft report for ARCO Sunfish project. MJM Research. 100p.

Murray, N.K., and F.H. Fay. 1979. The white whales or belukhas, Delphinapterus leucas, of Cook Inlet, Alaska. Draft prepared for June 1979 meeting of the Sub-committee on Small Cetaceans of the Scientific Committee on Small Cetaceans of the Scientific Committee of the Int'l Whaling Comm. College of Environmental Sciences, Univ. Alaska, Fairbanks. 7pp.

Nowak, Ronald M. 1991. Walker's marine mammals of the world. Volume 2. Fifth Ed. Baltimore: The Johns Hopkins University Press.

O'Corry-Crowe, G.M., R.S. Suydam, A. Rosenberg, K.J. Frost, and A.E. Dizon. 1997. Phylogeography, population structure and dispersal patterns of the beluga whale Delphinapterus leucas in the western Nearctic revealed by mitochondrial DNA. *In*: Molecular Ecology, Vol. 6: 955-970.

Payne, Susan A., B.A. Johnson, and R.S. Otto. 1999. Proximate composition of some north-eastern Pacific forage fish species. Fish Oceanogr. 8:3, 159-177.

Perez, Michael A. 1990. NOAA technical memorandum NMFS F/NWC-186. Review of marine mammal population and prey information for Bering Sea ecosystem studies.

Pete, S. 1987. Shem Pete's Alaska, the Territory of the upper Cook Inlet Dena'ina. Alaska Native Language Center, University of Alaska, Anchorage, Alaska.

Rausch, R.L. 1970. Trichinosis in the Arctic. Pp. 348-373 in: S.E. Gould (ed.) Trichinosis in man and animals. Charles C. Thomas, Springfield, IL.

Richardson, W.J. 1995. Marine mammal hearing. *In*: Marine mammals and noise. W.J. Richardson, C.R. Greene, Jr., C.I. Malme, and D.H. Thomson, eds. Academic Press. 576 p.

Ridgway, Sam and Sir Richard Harrison. 1981. Eds., Handbook of marine mammals. Volume 4. London: Academic Press.

Selkregg, Lidia L., Ed. 1974. Alaska regional profiles; southcentral region. University of Alaska, Arctic

Environmental Information and Data Center. 225 pp.

Sergeant, D.E. and P.F. Brodie. 1969. Body size in white whales, *Delphinapterus leucas.* Journal Fisheries Research Board of Canada 26(10), pp. 2561-2580.

Sergeant, D.E. and P.F. Brodie. 1975 Identity, abundance, and present status of white whales, *Delphinapterus leucas,* in north America. Journal Fisheries Research Board of Canada 32(7), 1975, pp. 1047-1054.

Stanek, Ronald T. 1994. The subsistence use of beluga whale in Cook Inlet by Alaskan natives, 1993. Draft Final report for year two, subsistence study and monitoring system No. 50ABNF200055. ADFG, Juneau, Alaska. 23 pp .

Stanek, Ronald T. 1996. Belukha hunters of Cook Inlet, Alaska. *In* Adventures through time: readings in the anthropology of Cook Inlet, Alaska. Edited by N. Yaw Davis and W.E. Davis. The Cook Inlet Historical Society, Inc. Anchorage, Alaska.

Suydam, Robert, J.J. Burns, and G. Carroll. 1999. Age, growth, and reproduction of beluga whales from the eastern Chukchi Sea, Alaska. Paper presented to the Alaska Beluga Whale Committee workshop, March 30-April 1, 1999. 5 pp.