

**The Subsistence Use of
Beluga Whale in Bristol Bay
by Alaska Natives, 1993**

Technical Paper No. 231

by Molly Chythlook and Philippa Coiley

Final Report for Year Two
Subsistence Study and Monitor System (No. 50ABNF200055)
Subsistence Research and Monitoring
of Beluga Whale, Bristol Bay and Cook Inlet
Prepared for the National Marine Fisheries Service

Alaska Department of Fish and Game
Division of Subsistence
Juneau, Alaska
July 1994

Frontispiece. Beluga toggling harpoon points similar to those from the Bristol Bay area, southwest Alaska (Yup'ik), from historic [top] and contemporary [bottom] periods. The historic piece (from the Seward Peninsula area, *Okvik* design, unknown date) has a ground slate point set in an ivory foreshaft, while the contemporary piece (from Dillingham) has a point and foreshaft of steel. Historic point courtesy of the Samuel K. Fox Museum in Dillingham. Photo courtesy of Philippa Coiley and Fritz Johnson.

The Alaska Department of Fish and Game conducts all programs and activities free from discrimination on the basis of sex, color, race, religion, national origin, age, marital status, pregnancy, parenthood, or disability. For information on alternative formats available for this and other department publications, please contact the department ADA Coordinator at (voice) 907-465-4120, (TDD) 1-800-478-3648 or (FAX) 907-586-6595. Any person who believes s/he has been discriminated against should write to: ADF&G, P.O. Box 25526, Juneau, Alaska 99802-5526; or O.E.O., U.S. Department of the Interior, Washington, D.C. 20240.

ABSTRACT

This report describes the subsistence use of beluga whale by Alaska Natives in the Bristol Bay area of southwest Alaska. Information derives from interviews with beluga hunters by the Division of Subsistence, Alaska Department of Fish and Game, with funding from the National Marine Fisheries Service. As described in the report, currently residents of at least twelve communities in the Bristol Bay area are known to harvest or use beluga, including Aleknagik, Clark's Point, Dillingham, Igiugig, Iliamna, King Salmon, Levelock, Manokotak, Naknek, South Naknek, Togiak and Twin Hills. Historic harvests also occurred at Kulukak and *Kangimaq* southeast of Platinum. Beluga are used for human consumption and dog food. Beluga meat, skin, and oil are shared between families. Beluga are taken by hunters in shallow water associated with tidal flats or within rivers, primarily during spring or fall, with preferred seasons differing among communities. Beluga are hunted from skiffs with harpoons, floats, and rifles; taken with set nets; and hunted from shore with rifles. Based on interviews with hunters, about 39 beluga were taken by hunters from nine communities in Bristol Bay in 1993. Of these, 33 beluga (84.6 percent) were harvested and 6 beluga (15.4 percent) were struck and lost. Historic takes were reported to be higher when there were greater numbers of dog teams to feed. Beluga hunters convened in Dillingham in March 1994 and voted to form the Bristol Bay Cetuarcutulit, a beluga whale committee representing hunters in the Bristol Bay area.

ACKNOWLEDGEMENTS

This report was made possible through the efforts of many people. Homer Bartman conducted the surveys in Manokotak; and Nina Fuller, Steve Nowatak, Trefim Andrew, Vicki Vanek (Division of Subsistence), and Ted Krieg (Bristol Bay Native Association) conducted many of the surveys in South Naknek, Kokhanok, Igiugig, and Levelock. Larry Van Daele and Richards Sellers of the Division of Wildlife Conservation along with Kathy Frost, who is also a member of the Alaska and Inuvialuit Beluga Whale Committee, were generous with their support. We also thank Bob Wolfe, Division of Subsistence, for reviewing the report. The Bristol Bay Cetuarcutulit, the Natural Resources Department staff at the Bristol Bay Native Association, and the Alaska and Inuvialuit Beluga Whale Committee, especially Robert Suydam, all gave us valuable support without which this research would not have been possible. And most of all, we thank the many people in the Bristol Bay area who volunteered their time and offered their knowledge about beluga whale, which we have attempted to record here.

TABLE OF CONTENTS

SECTION.....	PAGINATION
INTRODUCTION.....	1
HISTORIC USE OF BELUGA IN BRISTOL BAY	2
CONTEMPORARY USE OF BELUGA IN BRISTOL BAY	4
Communities Harvesting and Using Beluga in the Bristol Bay Area	4
General Seasons of Beluga Hunting in the Bristol Bay Area	7
General Hunting Locations in the Bristol Bay Area	7
General Beluga Hunting Methods in the Bristol Bay Area	7
Uses of Beluga in the Bristol Bay Area.....	9
Sharing and Exchange of Beluga Products	9
Estimated Beluga Take in Bristol Bay, 1993.....	10
COMMUNITY USE PATTERNS.....	11
Beluga Use at Manokotak.....	11
Beluga Use at Aleknagik.....	15
Beluga Use at Levelock.....	15
Beluga Use at Dillingham	18
Beluga Use at Clark's Point	20
Beluga Use at Igiugig.....	20
Beluga Use at Naknek, South Naknek, and King Salmon	21
Historic Beluga Use at Togiak, Kulukak, and <i>Kangimaq</i>	22
THE BRISTOL BAY CETUARCUTULIT.....	24
BELUGA SKIN SAMPLES COLLECTED IN 1993	25
SUMMARY.....	25
REFERENCES	27
REFERENCE LIST OF YUP'IK TERMS USED IN REPORT.....	29

LIST OF TABLES AND FIGURES

FIGURE OR TABLE PAGINATION

Figure 1. The Bristol Bay Area..... 3

Table 1. Estimated Take of Beluga Whale (*Delphinapterus leucas*)
by Alaska Native Hunters in the Bristol Bay Area, 1993 6

INTRODUCTION

This report describes the subsistence harvest and use of beluga whale (*cetuaq*, *Delphinapterus leucas*) in Bristol Bay by Alaska Natives in 1993. This report provides information on the number, seasons, and geographic distribution of harvested animals. The report also provides descriptions of the patterns of use of beluga in Bristol Bay, based on interviews with marine mammal hunters. The report derives from a two-year study of beluga, harbor seal, and sea lion in Alaska. The research was conducted by the Division of Subsistence of the Alaska Department of Fish and Game under contract with the National Marine Fisheries Service. The study was conducted in cooperation with the Alaska and Inuvialuit Beluga Whale Commission and the Indigenous People's Council for Marine Mammals.

The beluga whale is one of several toothed whales in Alaska. In the Gulf of Alaska, beluga range from Yakutat to Kodiak Island, with the main concentration of animals in the Cook Inlet area. A much larger beluga group ranges seasonally throughout the Bering, Chukchi, Beaufort seas in open water areas. Major distinct concentrations of this second group occur along the coast of Alaska in Bristol Bay, Norton Sound, Kotzebue Sound, and Kasegaluk Lagoon (Klinkhart 1966).

Beluga whale seasonally range in the near-shore waters of Bristol Bay of southwest Alaska. Beluga are found in abundance, primarily from spring through fall, near the mouths of the Kvichak, Nushagak, and Igushik rivers (Fig. 1). Beluga commonly travel many miles up these river systems, to the flats just below Igiugig on the Kvichak River, to Portage on the Nushagak River, and almost to Manokotak on the Igushik River. Beluga are also observed in the Naknek and Wood rivers. Beluga are occasionally seen in the Bristol Bay area during winter in areas of open

water. Since 1953, the beluga population of the Bristol Bay area has been estimated to number between about 1,000 to 1,500 animals. The preliminary results of population surveys conducted by the state for the Alaska and Inuvialuit Beluga Whale Committee during the summers of 1993 and 1994 suggest the population continues at that level (Lowry 1994).

HISTORIC USE OF BELUGA IN BRISTOL BAY

The subsistence use of beluga has a long tradition in the Bristol Bay area, continuing down to the present day. Beluga bones were recovered in archaeological excavations at Old Togiak (Kowta 1963), the Naknek River (Dumond 1981), and Nushagak (VanStone 1972). Use of beluga by people in the Bristol Bay area was recorded by Russians visiting in the 19th century. In 1818, Korsakovskiy met men hunting beluga near Egegik (VanStone 1988:28-31). At a village near the Naknek River, he was offered dried, smoked, and boiled beluga meat, fat, and flippers, as well as beluga sinew used for making seines and fish lines (VanStone 1988:28-31, 47). In 1822, Khromchenko said of hunters he met on Nushagak Bay, "they take many belugas [white whales] and seals and trade the skins and blubber to neighboring Indians [Eskimos] for beaver and otter skin" (VanStone 1973:53; notes in brackets from VanStone). In 1829, Vasilev noted beluga hunting at a village near the mouth of the Togiak River, and reported that people traded marine mammal products with others living inland (VanStone 1988:99). In late April 1883, Jacobsen encountered a large group of men hunting beluga in Kvichak Bay (Jacobsen 1977:189).

Descriptions of technology used for hunting beluga during the late 19th century in Bristol Bay, including detachable toggle-headed points, have been made by VanStone (1972:31). Of beluga technology collected between 1882-86 from

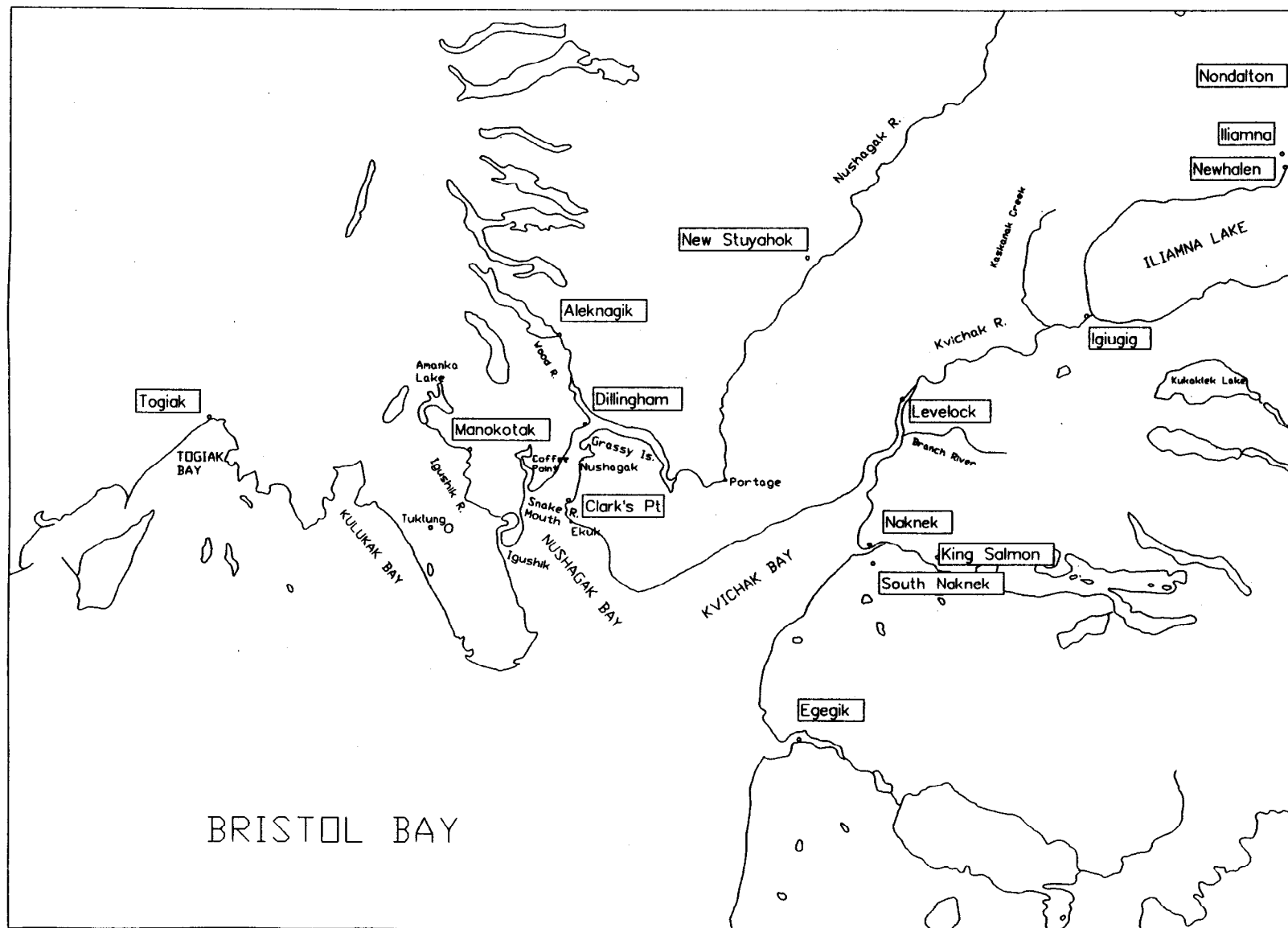


Fig. 1. Bristol Bay Area

Nushagak, kept at the U.S. National Museum in the McKay-Johnson collection, he writes:

A complete beluga harpoon in the collections is 155 cm [5 feet] long. At one end is a hollowed-out walrus tusk with a metal ring in the end to which a line was attached. There is an ivory finger rest about midway along the thick, heavy shaft, and at the other end is a heavy bone socketpiece with a wedge-shaped tang. The foreshaft and harpoon head unfortunately are missing. Three additional socketpieces resemble the one just mentioned. One of these is illustrated by Mason (1902, fig. 92, p. 302). There is also a float made of a whole seal skin intended for use with a beluga harpoon. It is 66 cm long, 41 cm wide [26 x 16 inches], and has an ivory plug with a wooden stopper. (VanStone 1972:31)

Beluga harpoons were thrown by hand and, compared with seal harpoons, had larger shafts, socket pieces, and foreshafts for deeper penetration (Nelson 1983:135-140; VanStone 1972:31).

CONTEMPORARY USE OF BELUGA IN BRISTOL BAY

Communities Harvesting and Using Beluga in the Bristol Bay Area

Currently, residents of at least twelve southwest Alaska communities are known to harvest beluga for subsistence in the Bristol Bay area, including Aleknagik, Clark's Point, Dillingham, Igiugig, Iliamna, King Salmon, Levelock, Manokotak, Naknek, South Naknek, Togiak and Twin Hills. Historic communities that used beluga in the recent past include Kulukak on Kulukak Bay, and *Kangirnaq* (USGS Kinegnak), southeast of Platinum. Beluga is widely shared between families living in and outside the southwest region, so a larger, though undetermined, number of communities make use of beluga products that come from the Bristol Bay region. Communities in the Bristol Bay area where no beluga hunters were identified during the first year of this project included some inland Nushagak River communities (Ekwo, Koliganek, New Stuyahok, and Portage Creek), some inland Iliamna Lake area communities (Newhalen, Kokhanok, Nondalton, and Pedro Bay),

and three Alaska Peninsula communities (Egegik, Pilot Point, and Ugashik).

It is difficult to precisely estimate the number of beluga hunters in the Bristol Bay area. For this project, known beluga hunters were contacted to learn about the pattern of beluga use in Bristol Bay. Key respondents were asked about active beluga hunters in their home community. Some of these hunters also were contacted and interviewed. Through this chain referral method, an estimate of the number of hunters was made for the Bristol Bay area (Table 1).

As shown in Table 1, the project identified about 42 active beluga hunters in the Bristol Bay area. Some hunters of beluga probably were missed by the chain referral method, particularly persons who harvested beluga more occasionally, so this is a conservative estimate of beluga hunters in the Bristol Bay area. Not all hunters identified in Table 1 were active each year, so this probably is a high estimate for the number of persons actually hunting beluga on an annual basis in the Bristol Bay area.

By community, the numbers of hunters were as follows: King Salmon-Naknek-South Naknek (11 hunters), Dillingham (9 hunters), Manokotak (6 hunters), Levelock (5 hunters), Aleknagik (4 hunters), Clark's Point (3 hunters), Igiugig (2 hunters), and Iliamna (2 hunters). Beluga historically were taken in the Togiak-Twin Hills area, but currently, due to the absence of local beluga stocks, there were no active beluga hunters identified for these communities in Table 1. The counts of beluga hunters in each community indicate that beluga hunting was a relatively specialized subsistence activity in each community, compared with subsistence activities like salmon fishing or moose hunting, for which there are larger number of harvesters. As discussed below, the numbers of persons using beluga products are substantially larger than the number of harvesters, because beluga products are widely distributed.

TABLE 1
Estimated Subsistence Take of
Beluga Whale (*Delphinapterus leucas*)
By Alaska Native Hunters
In the Bristol Bay Area, 1993

Community	Estimated Number of Current Hunters*	Spring (May-June)			Summer-Fall (July-Sept)			Total 1993		
		Struck			Struck			Struck		
		Harvest	and Lost	Take	Harvest	and Lost	Take	Harvest	and Lost	Take
King Salmon, Naknek										
South Naknek	11	0	0	0	2	0	2	2	0	2
Aleknagik	4	2	0	2	1	1	2	3	1	4
Clark's Point	3	0	0	0	4	3	7	4	3	7
Dillingham	9	1	0	1	2	0	2	3	0	3
Igiugig	2	1	0	1	2	0	2	3	0	3
Iliamna	2	0	0	0	0	0	0	0	0	0
Levelock	5	5	0	5	2	1	3	7	1	8
Manokotak	6	7	0	7	4	1	5	11	1	12
Togiak	0	0	0	0	0	0	0	0	0	0
Twin Hills	0	0	0	0	0	0	0	0	0	0
TOTAL	42	16	0	16	17	6	23	33	6	39

* Not all hunters are active each year

Source: Division of Subsistence, Alaska Department of Fish and Game

General Seasons of Beluga Hunting in the Bristol Bay Area

In the Bristol Bay area, beluga were taken primarily in spring and fall. Fall was reported to be the preferred time to hunt beluga in several communities, particularly near or after the close of commercial salmon fishing in September. Other communities preferred hunting in spring and early summer, before the commercial fishing seasons for herring and salmon. Some beluga are taken during summer as well. The preferred seasons and actual timing of beluga harvests varies somewhat between communities and between years because of a number of factors, as described below.

General Hunting Locations in the Bristol Bay Area

Beluga are taken in areas where they are accessible to hunters. Hunting locations are usually in areas of shallow water associated with wide tidal flats, or within rivers near communities. Hunting locations include the mouth of the Branch River (USGS Alagnak River) on the Kvichak River, near the mouth of the Igushik River, Grassy Island in Nushagak Bay, the Snake River mouth, Coffee Point, Combine Flats (between Clark's Point and Nushagak), and the area between Clark's Point and Ekuk. Historic areas for hunting beluga include Togiak and Kulukak bays. The areas used by hunters from particular communities are described below.

General Beluga Hunting Methods in the Bristol Bay Area

There are several hunting methods currently used to take beluga in the Bristol Bay area. Hunting methods differ somewhat between communities, depending upon local hunting traditions and local conditions. However, in general, there are three methods -- hunting from skiffs with harpoons, floats, and rifles; taking beluga in nets; and hunting from shore with rifles.

The most common hunting method is for hunters to use skiffs, harpoons, and rifles to take beluga. With this method, hunters chase or herd beluga in shallow, near-shore waters. A harpoon with a detachable toggle point attached to a line and float is thrown by hand, striking the animal. Hunters follow the whale, which further tires from dragging the float. Hunters shoot down the line, aiming at specific kill spots near the back of the beluga's head. Killed beluga are retrieved and towed to shore for processing. Whales were rarely struck and lost by this method, according to hunters.

Another method used by some hunters is to take beluga in nets. Nets are sometimes made specially for this activity, while at other times, beluga are taken in used salmon nets. Some hunters use beluga nets which are about 12-14 fathoms long (about 22-25.5 meters), 10 meshes deep (about 4.4 meters), with 17.5 inch mesh (about 44.5 centimeters). The set net is anchored in the shallow waters of tidal flats and checked periodically. At times, beluga break out of the net and swim free. Usually, a beluga becomes wrapped in the net and drowns. If still alive when the net is checked, the beluga is shot by the hunter. The beluga is towed to a beach for processing. Hunters report that few whales are lost when taken with nets. From one to three beluga can be caught at a time in a net. Hunters set short lengths of net to avoid catching too many.

A third hunting method is to shoot at beluga from the shore or from skiffs without the use of a harpoon and floats. Some hunters use this method in shallow, tidally-influenced areas with depressions or ridges. Killed or wounded beluga are caught by the depressions or beach ridges as the tide recedes, and are retrieved by hunters. Using this method, hunters report that some killed beluga may be carried away by the currents, winds, or tides and lost.

Uses of Beluga in the Bristol Bay Area

There are a number of traditional subsistence uses of beluga, including food for humans and for working sled dogs. Items commonly used from the beluga for human consumption include the skin, blubber (fat), flippers, and backstrap meat along the spine, particularly near the blow hole. Larger, adult white beluga are usually preferred over the younger grey whales. The skin of adult whales is firmer ("crunchier") compared with the skin of young grey calves. Beluga products are prepared a number of ways, such as boiling skin and meat (eaten hot or cold); flouring and frying or barbecuing backstraps; and processing fat into oil for use with dried fish and meat. Ways of preserving and using beluga products show local differences between communities and families.

Beluga also are used for feeding dogs in the Bristol Bay area. Use of beluga for dog food predates the time when snowmachines became common in the region. Dog teams continue to be used by some families in the Bristol Bay area, as has the traditional practice of using beluga products to feed them.

Sharing and Exchange of Beluga Products

Beluga is shared widely between families and friends, both in and outside the Bristol Bay area. Beluga products are shared and exchanged between relatives and friends in different households. Beluga skin and oil are shared and exchanged to inland communities along the Nushagak River and in the Iliamna Lake area. Another way beluga is shared is through a general distribution on the beach. News of the harvest is spread among families at the camp or community. People are invited to come to the beach and take pieces. It is common for a beluga to be reduced to almost nothing after such a public invitation.

Estimated Beluga Take in Bristol Bay, 1993

Based on reports of hunters, it is estimated that about 39 beluga were taken in Bristol Bay for subsistence uses in 1993 (see Table 1). Of the estimated total take, 33 beluga were harvested (84.6 percent) and 6 beluga were struck and lost (15.4 percent). The beluga take by community in 1993 was as follows: Manokotak (12 beluga), Levelock (8 beluga), Clark's Point (7 beluga), Aleknagik (4 beluga), Dillingham (3 beluga), Igiugig (3 beluga), and King Salmon-Naknek-South Naknek (2 beluga). Communities taking no beluga in 1993 included Iliamna, Togiak, and Twin Hills. Of the total harvest, 16 beluga (41 percent) were taken in spring (May-June), and 23 beluga (59 percent) were taken in summer-fall (July - November).

To estimate the subsistence take of beluga in 1993, the following methods were used. In Manokotak, a beluga survey was administered to sampled households by a local researcher, hired and trained to conduct a similar survey for harbor seal and sea lion. A two strata sampling design was used. In the "active household" stratum, 12 of 12 households were interviewed, while in the "other household" stratum, 20 of 65 households were interviewed. In Levelock, Igiugig, Kokhanok, and South Naknek, beluga harvest information was collected as part of a household survey of all subsistence resources. Using a census survey, the sample of households were as follows: Levelock (30 of 39 households), Igiugig (10 of 12 households), Kokhanok (36 of 39 households) and South Naknek (35 of 42 households).

Preliminary estimates of beluga take for 1993 were made for each community based on the household surveys and reports from hunters or households, as described above. The preliminary estimates were put into a table and presented to members of the Bristol Bay Cetuarcutulit during a meeting in March 1993. Based on additional information collected during that review, the harvest estimates were augmented and revised.

COMMUNITY USE PATTERNS

Beluga Use at Manokotak

The community of Manokotak is situated along the Igushik River, about 40 miles (64 kilometers) inland from its mouth and mid-way to Amanka Lake (Manokotak Lake). Manokotak residents are originally from several areas, including Platinum, Togiak, Kulukak, Tuklung (an old village site upriver from Igushik), and Iyussiiq (Igushik), the old village site located at the mouth of the Igushik River. Because many people have ancestors from coastal communities, hunters possess the knowledge and techniques for marine mammal hunting. In addition, because of their use of inland areas, hunters have knowledge of land hunting. Manokotak hunters consider themselves to be "hunters with two arms", that is, "complete" or "whole" hunters, in that they are knowledgeable about hunting on both the sea and the land.

During spring and fall, beluga enter the Igushik River at high tide and feed in *qanturarnik* (deep pools) located inside bends of the river. They are often seen in the river at high tides. Historically, the residents of Iyussiiq hunted them at these times. Some years, a few beluga travel up the Igushik River. They have been known to travel all the way up to Amanka Lake.

There are three different seasons that Manokotak hunters harvest beluga. The first is during early spring, about April and May, or soon after the Igushik River is becoming free of ice. At this time, beluga are sometimes seen near Manokotak in the Igushik River. The early spring harvest is more of a chance harvest than a targeted activity. Beluga do not appear every spring. Also, at this time, Manokotak residents are busy preparing for commercial herring and salmon fishing. The electricity is turned off in Manokotak after residents move to Igushik, the seasonal settlement at the mouth of the Igushik River used for fishing during summer.

Freezers in the community are turned off and cleaned out for the summer season. If a beluga is harvested from the river at this time, it is widely shared among families in the community. It is considered a treat and a change from eating freezer-stored food to have fresh beluga in early spring. Not much of a beluga taken in early spring will be left to store for later use.

The second season is during the salmon fishing season, while Manokotak residents are living at Igushik. Beluga are sometimes harvested near the Igushik River mouth at this time. Like the early spring harvest, the beluga harvests are widely shared among people living at the Igushik camp. This includes some families from Aleknagik, Dillingham, and other communities who are using the Igushik site as a base for commercial fishing. Beluga taken during summer supplements a diet containing large amounts of fresh salmon.

The third and main hunting season for Manokotak residents is during fall, after families have returned to Manokotak from Igushik. The fall hunts are done just before the Igushik River freezes in October. Beluga hunters travel to the mouths of the Igushik and Snake rivers and to Igushik Bay, using small skiffs like the 18-foot aluminum Lund boat. The fall beluga harvests are preserved and stored in freezers for later use by the immediate family members of the harvester. Portions of the harvest are shared with persons outside the immediate household as well.

Manokotak hunters harvest beluga in shallow water about 2-8 feet deep (0.6-2.6 meters), using harpoons similar to those used for taking seal, attached to a line with a buoy or float. The metal harpoon points are custom made and show differences between individuals, depending in part on where each person learned his technique. The line is commonly about 20-25 feet long (6-7.6 meters), but its length will be varied depending upon the water depths of the area being hunted. In the past, seal pokes were used as buoys. Currently, floats attached to the line are

made from a variety of things, including clorox bottles and neon red commercial salmon buoys. The float acts as a drag along the line, and helps hunters track and retrieve the harpooned animal.

A higher caliber rifle is commonly used to harvest beluga than to harvest seal. Like walrus, the beluga have a point at the back base of the neck, called the *tunucukvak*, where they can be shot and instantly killed.

Because of their large size, killed beluga are towed to a butchering area on a beach, instead of being processed from a skiff. Hunting in calm water makes retrieving and towing easier and safer. The entrails are removed soon after the beluga is harvested to avoid spoilage of the internal organs which are saved for eating, including the liver, intestines, and kidneys. The blubber and hide are carefully carved away from the meat and removed in block sections. The sections are placed skin side down to help the cooling process of the blubber. The remainder of the carcass is processed according to how the meat is going to be used. Flippers are commonly retained, and the harvesters have the priority over them.

In 1973-74, 19 households (50 percent) were surveyed in Manokotak by Gasbarro and Utermohle (1974). This survey counted 4 beluga harvested by 4 households. They estimated a total harvest of 8 beluga for the community by 21.0 percent of community households for the survey year 1973-74. More recently, systematic household surveys were conducted in Manokotak by the Division of Subsistence in 1985 and 1993. Based on household surveys, 25.9 percent of households attempted to harvest beluga, 22.2 percent harvested beluga, 50.0 percent used beluga, 31.5 percent gave away beluga, and 31.3 percent received beluga in 1985. Manokotak hunters harvested 7 beluga whales in 1985, according to the survey (Schichnes and Chythlook 1988; ADF&G 1994). In 1993, 15.6 percent of households attempted to harvest beluga, 15.6 percent harvested beluga,

100.0 percent used beluga, 34.4 percent gave away beluga, and 84.4 percent received beluga. In 1993, it is estimated that Manokotak hunters killed 12 beluga (Table 1).

The middle-sized, white-skinned beluga, which are reported to weigh up to a thousand pounds, are preferred by Manokotak hunters over the young, gray-skinned beluga. The outer gray skins of young beluga do not take to cooking before the skin turns soft and mushy. The white-skinned beluga can be blanched or boiled to soften the thin layer of gristle located between the white skin and the blubber. The *qecik* (skin) is best eaten with the blubber. The young gray whales have softer, thinner skins compared with the thicker, firmer skins of adults. Consequently, hunters target the white adult whales, and leave the gray beluga to mature.

In the past, the white beluga skins were well cooked, placed in *caqusayuk* (sealskin pokes), and stored in *uqucilek* (underground storage pits). Currently, some of the skin and blubber are placed in ziploc plastic bags and stored in freezers. Depending upon freezer space, some households will salt the skin and blubber for storage in a dark, cool place. Later, the salted skin and blubber are soaked of brine and cooked. The aged skin eaten raw is called *tamukassaaq*. Raw, fresh skin and flippers also can be eaten, but cooked beluga is usually preferred. The skin and blubber tend to be very rich in oil, and so are eaten with cooked fish or meat.

In the past, beluga intestines (*irnerrluk*, "beluga guts") were seldom used for making rain gear due to their narrow size. The process of sewing the narrow gut was time consuming. Walrus guts were preferred because they were larger and had a more durable texture. In the past, beluga blood also was used in certain recipes, cooked and thickened with flour into a sauce.

Beluga harvests in the Manokotak area were larger in the past, when dog teams were used for daily transportation and all households with active hunters

owned teams. The late fall beluga hunts were used to produce food for the dogs. The rich meat and blubber supplemented dried fish for feeding dogs during winter.

Beluga Use at Aleknagik

The community of Aleknagik is located at the outlet of Lake Aleknagik, where it is drained by the Wood River, about 20 miles (32 kilometers) inland from Nushagak Bay. Many residents of Aleknagik trace their origins to the Togiak and Kulukak areas. The knowledge of how to hunt and use beluga derives in part from those coastal areas.

Beluga harvest and use patterns by Aleknagik residents are similar to those of Manokotak, which were described above. Some beluga are harvested near the community, if they are encountered swimming up the Wood River toward the lake. Beluga are known to enter Lake Aleknagik during high tides through the Wood River. Beluga are also harvested at the mouth of the Wood River and other locations in Nushagak Bay. Hunters travel to hunt using small skiffs. Some Aleknagik residents camp at Igushik during summer to fish for salmon. Beluga are taken and used at this time, in the same manner as described for Manokotak residents.

Beluga Use at Levelock

The community of Levelock is located along the Kvichak River, mid-way between the coastal areas of Kvichak Bay and freshwater Lake Iliamna. The river is influenced by tides at Levelock, but access to beaching areas is possible at all tidal stages. Within the last ten years, the river channel has switched to the village side, which makes skiff access easier. Residents of Levelock trace their origins from several areas, including the Kvichak coast, Iliamna Lake, and the Yukon River. There has been a mixing of inland and coastal hunting traditions at Levelock.

Beluga travel up the Kvichak River during early spring. Beluga feed on salmon smolt coming out from Iliamna Lake during spring, according to local hunters. They are regularly seen in front of Levelock during in-coming tides. Small gray whales are seen with the adult white whales. The grey whales stick to their mothers' backs. When chased with boats, the mothers and babies separate, but then quickly come together again.

There are two distinct hunting seasons for Levelock beluga hunters, during spring (April and May), which is usually the larger harvesting period, and during fall (September). The spring hunt starts as soon as the Kvichak River is safe of flowing ice. The first beluga which reach the village during high spring tides are a welcome sight to hunters.

Beluga are available throughout spring, summer, and fall, but hunters prefer the spring season for several reasons. Hunters prefer to harvest beluga when they are close to the village in early spring, and target whales at that time. Later on, when skiff activity increases in the Kvichak River, beluga tend to move back down to the lower entrance of the river. The spring beluga provide a welcome change in diet after a winter of eating freezer-stored resources. The hunt provides fresh blubber to render into oil and fresh meat to dry for use during the approaching commercial salmon fishing season. The hunt provides men the first opportunity of the year to test their boats and motors which have been stored during winter. Beluga harvested in spring are used primarily for human food, although some are used for dog food.

Beluga harvests in the fall usually are lower than in spring, unless the spring hunts were not very successful. A smaller percent of the fall harvest is for human consumption. Households with dog teams store a winter supply of dog food from the fall harvests, because the cooler weather helps prevent cached dog food from spoiling.

Levelock hunters take beluga using small skiffs (such as the 18-foot Lund), harpoons with metal toggle points attached to a line and float, and rifles (such as the 270). Beluga are pursued, harpooned, and shot. Some traditional hunters thump against the sides of their skiffs to attract beluga into shallow water.

Most of the beluga taken in Levelock for human consumption is stored in freezers for later use. Levelock residents render some of the beluga fat into oil. Some residents say they prefer beluga oil over seal oil. Beluga products are widely shared with relatives and friends from other communities, such as Kokhanok, Iliamna, Igiugig, and Newhalen. If most of the cached beluga products have been given away during summer, they are replenished during the fall hunt for winter use.

In 1973-74, 16 households (100 percent) were surveyed in Levelock by Gasbarro and Utermohle (1974). This survey counted 4 beluga harvested by 3 households (19 percent of households) for the survey year 1973-74. More recently, systematic household surveys were conducted in Levelock by the Division of Subsistence in 1988 and 1993 (ADF&G 1994). In 1988, 27 of 33 households were surveyed in Levelock. The survey estimated that 23 beluga were harvested in 1988, 15 during spring and 8 during fall. That year, 33.3 percent of households harvested beluga and 55.6 percent of households used beluga products in Levelock. In 1993, the survey at Levelock estimated that 8 beluga were taken. In 1993, 19.2 percent of households hunted beluga, 11.5 percent harvested beluga, 53.8 percent used beluga, 42.3 percent gave away beluga, and 50.0 percent received beluga in Levelock.

In the past, there were larger numbers of beluga harvested by Levelock residents, due to greater numbers of dogs. The rich beluga meat and fat supplemented dried fish and other foods fed to dogs. The relatively large size of the animal was another reason it was harvested as dog food, as the processed meat and fat lasted for weeks. In response to the 1988 survey, beluga hunters reported

that 75 percent of the usable spring take was used for human consumption and 25 percent for dog food, while 25 percent of the fall take was used for human consumption and 75 percent for dog food.

In 1958, several Levelock residents helped researchers capture five beluga for the New York Zoological Society and the Pacific Ocean Park Aquarium in California. The beluga were captured at Halfmoon Bay on the north side of Kvichak Bay (Ray 1962; ADF&G 1958:87-88).

Beluga Use at Dillingham

Dillingham is a relatively large regional center in the Bristol Bay area. Its population has been drawn from a large number of communities in and outside the region, as well as from outside Alaska. Beluga are taken by a number of hunters in Dillingham, primarily in fall after commercial fishing. Hunting locations of Dillingham hunters include the mouths of the Igushik and Wood rivers, Grassy Island in Nushagak Bay, the Snake River mouth, Coffee Point, Combine Flats (between Clark's Point and Nushagak), and the area between Clark's Point and Ekuk.

Several harvest methods are used, including hunting from skiffs with harpoons, floats, and rifles in shallow water; setting beluga nets; and catching beluga in salmon nets. The most common method is chasing beluga in shallow water areas to take them with harpoon, floats, and rifles (described above for Manokotak). Other beluga are taken with nets by Dillingham residents. Short, large-mesh beluga nets are sometimes made specially for this activity. One hunter reported his net to be about 12-14 fathoms (22-25.5 meters) long, 10 meshes (4.4 meters) deep, with a 17.5 inch (44.5 centimeter) mesh. On this net, wood blocks were substituted for cork floats along the float line, as some beluga associate cork floats with fishing nets and will avoid set nets with cork floats. One hunter reportedly sets his net off a point while duck hunting in spring. He rechecks the net

at the end of the day. Some people use old salmon nets to harvest beluga, drifted from a boat like a salmon drift gill net by Grassy Island on Ralph's Slough, near shore where salmon migrate.

Dillingham residents report using beluga for a number of products, such as skin, blubber, meat, flippers, and the liver. Some hunters make beluga oil from the blubber, using it like seal oil. Beluga products are commonly cooked by boiling, sometimes with spices. Steaks from the backstrap are rolled in flour, salt, and pepper and fried. One hunter reported that spring and fall belugas have the same taste. Reportedly, some non-Native residents eat beluga taken by Native hunters, as do some seasonal Japanese workers. Beluga are also used for dog food in Dillingham.

Beluga products are widely shared among family and friends in Dillingham. Beluga products also are shared between Dillingham and other communities in the region, such as New Stuyahok. Kuskokwim residents who fish seasonally in Bristol Bay are known to take home beluga products. If beluga are taken near town in a fishing net, they are commonly pulled onto the beach, such as at Kanakanak or Snag Point, for butchering. People are notified and encouraged to come down to take a portion on a "first come, first serve" manner. Beluga is sometimes given to the Dillingham hospital and the senior center to serve at mealtime.

In 1991, an adult beluga was caught in a subsistence salmon net across the Wood River from Dillingham. The whale had drown. It was towed across the river to the Dagnet cannery, and the whale's location was broadcast on the radio for people to come and get it. Reportedly, the senior center drove over a van full of ladies and their ulus who cut up and took a good part of the whale. Later in the day, ADF&G staff checked on the site. Reportedly, there was nothing left but a "grease spot" and a backbone, which was transported to the Kanakanak hospital whose staff had requested it for soup.

In the summer of 1993, a young beluga was reported to be caught in a subsistence net on Snag Point near downtown Dillingham. When ADF&G staff arrived to see, about 25 people had come together at the net. Reportedly, about half the people wanted to let the whale go while the other half wanted to have the whale "for breakfast", and the people were discussing it. A decision was made that if in releasing the whale it was not hurt or wounded, it would be let go, but if it appeared to be injured, it would be harvested. As the whale appeared unhurt, it eventually was freed.

Beluga Use at Clark's Point

Beluga are attracted to the near shore waters around Clark's Point by large quantities of smelt. Residents of Clark's Point commonly harvest beluga during fall into November, just before freezeup. At times, hunters use the same equipment that they use while seal hunting: harpoon, buoy, rifle, skiff, and kicker. The beluga are taken in shallow water, about 3-4 feet (.9-1.3 meters) deep. At times, they are shot first, and then harpooned; at other times, beluga are harpooned first. When hunting in shallow water, beluga were reported to be rarely lost. At times, beluga are hunted from shore. Killed beluga are stranded in depressions with the falling tide. Reportedly, some whales were struck and lost by hunters using this method.

Residents of Clark's Point commonly used the skin, the meat, especially the rib sections, and flippers. Beluga oil was not made from the fat by Clark's Point residents. Seal oil is preferred over beluga oil. Currently, beluga is not used for dog food at Clark's Point.

Beluga Use at Igiugig

Igiugig is a community along the Kvichak River, near the outlet of Iliamna Lake. Igiugig residents have historic ties to the contemporary community of

Levelock, as well as former communities at Kaskanak Creek, Kukaklek Lake, and Branch River. Hunters from Igiugig take beluga in the Kvichak River during spring and fall, using techniques similar to those used at Levelock (see descriptions above). Families also receive beluga meat from relatives and friends in Levelock.

Beluga skin and a little of the fat are stored in freezers. Beluga fat is rendered for oil, which is highly regarded by Igiugig residents, reportedly tasting like Wesson oil. Beluga meat and flippers are used. It is said that potatoes take the fishy taste from beluga meat. Other beluga parts are used to feed dogs. Because the beluga are so huge, hunters share beluga products widely. Beluga products are commonly used during Slavi celebrations. One hunter from Igiugig stated, "Whale blubber goes a long way. By the time I send pieces away, I hardly have any left."

Beluga Use at Naknek, South Naknek, and King Salmon

In spring and in fall, beluga come into the Naknek River. In the past, hunters used to take beluga in the river. Hunters chased beluga up to the rapids on the Naknek River, and shot them when the whales turned to go down river. Currently during the summer, hunters report that the great amount of boat traffic tends to keep beluga and seals out of the river. Reportedly, the Bristol Bay Borough has regulations prohibiting shooting around town, including the Naknek River mouth. Because of this, some hunters now choose to travel away from town to hunt beluga, such as the sandbars of the Kvichak River to the northwest.

Hunters take beluga with harpoons, floats, and rifles, using small skiffs. One hunter reported shooting the beluga first with a large caliber rifle, and then immediately harpooning the animal. Then he shoots down the harpoon line with a 22 caliber rifle to kill the whale, which is towed to a bar or beach for butchering. Other methods reportedly used in the area included beluga nets and shooting from shore.

Parts of the beluga reportedly used for human food include the skin, fat, backstrap, and intestines. Backstrap meat is sometimes dried, and beluga skin is sometimes pickled. Other beluga parts are used for dog food at Naknek.

Historic Beluga Use at Togiak, Kulukak, and Kangirnaq

Togiak is situated at the mouth of the Togiak River, along the coast of Togiak Bay. Togiak's location makes it close to marine mammal hunting areas. The beaching area below the village is only accessible when the tide is in, so Togiak hunters work around the tides, leaving and returning with the water. The beach at Togiak is a mixture of sand and larger pebbles. It is not adequate as a marine mammal butchering area, because of sand getting into the meat and fat. When marine mammals are harvested, hunters usually take their harvests to other beaches nearby which are rocky for butchering.

Early in the 1900s, beluga appeared in large numbers in the Togiak area. During spring and again in fall, the beluga followed smelt, salmon, and other types of fish entering into the bay and river. Beluga were harvested at the mouth of the Togiak River when they became stranded during out-going tides. In the first few decades of the century, the beluga disappeared from Togiak Bay, and beluga harvesting by Togiak residents declined. One reason given in Togiak for the disappearance of beluga involves the grief of a powerful man (a shaman, or *angalkuk*) who lived in the Togiak area. According to local report, the man lost a child, and during his grieving, he transferred his grief for his deceased child to the beluga in Togiak Bay and sent them away, never to return. Since this time up to the present, there have been few beluga seen in the bay.

Kulukak Bay lies to the east of Togiak Bay. Beluga were hunted in Kulukak Bay, at least through the 1920s. Cleaned beluga skulls were placed at Quluut, a high point near the entrance of the bay, where they were visible from the sea. The

skulls were placed one beneath the other, horizontally. The skull location was cleaned every spring. The skulls were removed for cleaning and then exactly replaced in the same position. The respectful care of the skulls was done in hopes that the beluga would not completely disappear from the Kulukak area, as they had in Togiak Bay. The beluga gradually decreased in number from the Kulukak area, until by the early 1930s they were rarely seen or harvested.

Kangirnaq is an old village site located along the coast southeast of Platinum. The site has a small creek which can be entered by kayak or skiff for protection. The beach is accessible at both high and low tides. The area continues to be used by hunters from Platinum and Goodnews Bay for marine mammals and other resources.

Kangirnaq residents harvested beluga to help feed their dog teams. Some of the beluga was used as food for people, including skin, fat, and flippers. Most of the edible parts of beluga were fed to dogs. Beluga meat and rendered oil were not commonly used by people due to their strong wild taste (*ceturpagnik*, "smelling or tasting strongly of beluga"). People preferred to eat the oil, meat, and internal organs of seal.

Without refrigeration, beluga skins were processed and prepared for storage in underground pits located in the nearby tundra. Beluga skins were boiled until a sharp tester stick penetrated the skin with ease. The cooked skins were cooled, placed in seal poke containers, and placed in the pits until the first freeze in late fall. Flippers were prepared in the same fashion. Some flippers were aged and eaten cooked or uncooked.

THE BRISTOL BAY CETUARCUTULIT

On March 15, 1994, beluga hunters from eight communities in the Bristol Bay area (Aleknagik, Dillingham, Egegik, Igiugig, King Salmon, Levelock, Manokotak, and Togiak) convened in Dillingham for a one-day meeting. The session was organized through the Division of Subsistence in cooperation with the Natural Resources Department of the Bristol Bay Native Association, as part of this project. It was the first opportunity for beluga hunters in the region to formally meet to exchange information on issues concerning beluga whale use and management.

At the meeting, information was exchanged on several topics. A representative from the AIBWC presented materials on that organization, beluga management, beluga population in Alaska, and recent studies. The AIBWC representative introduced the draft Beluga Whale Management Plan from northern beluga hunting communities, and participants discussed the concept of a local management plan by hunters. Information on patterns of use of beluga whale was presented by ADF&G representatives, which was discussed and added to by participants.

After the exchange of information, the participants took action to formally organize into a group, called the *Bristol Bay Cetuarcutulit* (Bristol Bay Beluga Committee; *cetuaq*, "beluga"; *-tulit*, "people endowed with"). The group agreed to try to meet twice yearly, next in fall 1994 before the AIBWC meeting to discuss issues and record the fall harvest, and then in spring 1995 to hear reports back from the AIBWC. Participants nominated three individuals to serve as possible representatives to the AIBWC meeting.

BELUGA SKIN SAMPLES COLLECTED IN 1993

Attempts were made to collect beluga skin samples taken from whales harvested in the Bristol Bay area in 1993, for genetic testing by the National Marine Fisheries Service laboratory in La Jolla, California. Three samples of frozen beluga skin were collected:

1. Aleknagik. Female beluga, young (2-3 years). Date harvested: April 28, 1993. Date collected: March 11, 1994. Place harvested: Mouth of Snake River, Nushagak Bay.
2. Levelock. Male beluga, adult. Date harvested: mid-May 1993. Date collected: March 11, 1994. Place harvested: Shallows across from the entrance of the Branch River, Kvichak River area.
3. Manokotak. Beluga. No additional information.

The skin from which samples were taken had been frozen and stored by beluga hunting households during the previous year. Samples were shipped to Seattle for further testing.

SUMMARY

The use of beluga in Bristol Bay is part of a long subsistence tradition in the region. Currently, beluga are hunted in Bristol Bay for a number of purposes, including food for families, feeding dog teams, and sharing and exchange of beluga products between families and communities.

This research identified at least 42 beluga hunters from 12 communities in the Bristol Bay area. There are probably more hunters that were not identified who hunt beluga on some years. In 1993, we estimate that about 39 beluga were taken by hunters from nine communities in Bristol Bay. Of these, 33 beluga (84.6 percent) were harvested and 6 beluga (15.4 percent) were struck and lost.

According to hunters, the number of beluga taken for subsistence uses probably was greater in the past when there were greater numbers of dog teams to feed.

There are several hunting methods currently used in the Bristol Bay area, including hunting from skiffs with harpoons, floats, and rifles; taking beluga in nets; and hunting from shore with rifles. Beluga are hunted usually in areas of shallow water associated with tidal flats, or within rivers near communities. Beluga are taken primarily in spring and fall, with the preferred seasons differing between communities.

Currently, beluga hunting is guided by local rules passed down through families. The knowledge about the proper ways to hunt and to use beluga is taught by older adults to the younger generation.

The first meeting of beluga hunters in Bristol Bay to discuss beluga issues was held in Dillingham in March 1994. A group of fourteen hunters from eight communities exchanged information about beluga hunting, research, and management in Alaska. At the meeting, the hunters voted to create a group called the Bristol Bay Cetuarcutulit. The group agreed to try to meet twice each year to discuss beluga whale issues, and to try to send representatives to the annual meeting of the Alaska and Inuvialuit Beluga Whale Committee.

REFERENCES

- Alaska Department of Fish and Game
1958 **Annual Report**. On file, Division of Commercial Fisheries, Dillingham, Alaska.
- Alaska Department of Fish and Game
1994 **Community Profile Database**. Division of Subsistence, Juneau.
- Dumond, Don E.
1981 *Archaeology on the Alaska Peninsula: The Naknek Region, 1960-1975*. University of Oregon Anthropological Papers, No. 21. Eugene, Oregon.
- Gasbarro, Anthony G. and George Utermohle
1974 Unpublished field data, Bristol Bay Subsistence Survey. On file, Division of Subsistence, ADF&G, Anchorage.
- Jacobsen, Johan Adrian
1977 **Alaska Voyage 1881-1883: An Expedition to the Northwest Coast of America**. Translated by Erma Gunther. Chicago: University of Chicago Press.
- Klinkart, Edward G.
1966 **The Beluga in Alaska**. State of Alaska, Department of Fish and Game. Federal Aid In Wildlife Restoration Project, Volume VII.
- Kowta, Makoto
1963 **Old Togiak in Prehistory**. Unpublished Ph.D. Dissertation in Anthropology, University of California, Los Angeles.
- Lowry, Lloyd F.
1994 Personal Communication. Alaska Department of Fish and Game, Division of Wildlife Conservation, Fairbanks, Alaska.
- Mason, O.T.
1902 *Aboriginal American harpoons: a study in ethnic distribution and invention*. Report of the U.S. Natural History Museum for 1900, p. 189-304. Washington.
- Nelson, Edward William
1983 **The Eskimo About Bering Strait**. Washington: Smithsonian Institution Press.
- Ray, Carleton
1962 *Three whales that flew*. **National Geographic** 121(3):346-359.
- Schichnes, Janet C. and Molly B. Chythlook
1988 **Wild Resource Uses in Manokotak, Southwest Alaska**. Technical Paper No. 152, Division of Subsistence, Alaska Department of Fish and Game, Juneau.
- VanStone, James W.
1972 *Nushagak: An Historic Trading Center*. **Fieldiana Anthropology**, Volume 62. Chicago: Field Museum of Natural History.
- VanStone, James W. (editor)
1973 *V.S. Khromchenko's Coastal Explorations in Southwestern Alaska, 1822*. **Fieldiana Anthropology**, Volume 64. Chicago: Field Museum of Natural History.
- VanStone, James W. (editor)
1988 *Russian Exploration in Southwest Alaska: the Travel Journals of Petr Korsakovskiy (1818) and Ivan Ya. Vasilev (1829)*. The Rasmusen Library Historical Translation Series, Volume IV. Fairbanks: University of Alaska Press.

REFERENCE LIST OF
YUP'IK TERMS
USED IN THE REPORT

<i>caqusayuk</i>	Seal skin pokes used for storing subsistence foods, such as beluga skin and fat.
<i>cetuaq</i>	Beluga (<i>Delphinapterus leucas</i>)
<i>cetuarcutulit</i>	Beluga committee.
<i>ceturpagnik</i>	Smelling or tasting strongly of beluga.
<i>irnerrluk</i>	Intestines.
<i>Kangirnaq</i>	Old village site located along the coast southeast of Platinum.
<i>qanturarnik</i>	Deep pools in a river, where beluga sometimes feed.
<i>qecik</i>	Beluga skin.
<i>tamukassaaq</i>	Aged beluga skin.
<i>tunucukvak</i>	A point at the back base of the neck of a beluga or walrus, where they can be shot and killed quickly.
<i>uqucilek</i>	Underground storage pits used for storing subsistence foods, such as beluga skin and fat.