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Quantitative Description of

Potential Impacts of OCS Activities On Bowhead Whale Hunting Activities In the Beaufort Sea

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ACRONYMS AND ABBREVIATIONS

ACS	Alaska Clean Seas
ADF&G	Alaska Department of Fish and Game
AEWC	Alaska Eskimo Whaling Commission
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
ANWR	Arctic National Wildlife Refuge
ASRC	Arctic Slope Regional Corporation
ATV	All-terrain Vehicle
AVEC	Alaska Village Electric Cooperative
B.P.	Before Present
BASC	Barrow Arctic Science Consortium
BIA	U.S. Bureau of Indian Affairs
BLM	U.S. Bureau of Land Management
BP	Global company involved with energy development on the North Slope; formerly known as British Petroleum
CAA	Conflict Avoidance Agreement
DEW	Distant Early Warning
EA	Environmental Assessment
EIS	Environmental Impact Statement
GIS	Geographic Information System
GPS	Global Positioning System
IAI	Impact Assessment Incorporated
IRA	Indian Reorganization Act
ISER	Institute of Social and Economic Research
IWC	International Whaling Commission
KIC	Kaktovik Iñupiat Corporation
KWCA	Kaktovik Whaling Captains Association
MMS	U.S. Minerals Management Service
NARL	Naval Arctic Research Lab
NOAA	National Oceanic and Atmospheric Administration
NPRA	National Petroleum Reserve–Alaska
NSB	North Slope Borough
OCS	Outer Continental Shelf
OMB	U.S. Office of Management and Budget
PCB	Polychlorinated Biphenyl

SPSS	Statistical Package for the Social Sciences
TAPS	Trans-Alaska Pipeline System
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VFD	Voluntary Fire Department
WCC	Whaling Communication Center
WD	West Dock (Prudhoe Bay)
WIC	Women, Infants, & Children

EXECUTIVE SUMMARY

1.0 STUDY ORIGINS

The origins of this study may be traced to a March 2000 memorandum from the Alaska Eskimo Whaling Commission (AEWC) and the North Slope Borough (NSB) to the Minerals Management Service (MMS) describing the need for additional research regarding cultural, social, and economic impacts to Alaska Eskimo subsistence communities from ongoing arctic oil and gas exploration and production.

A central point of the memo was that residents of the communities of Barrow, Nuiqsut, and Kaktovik perceive that oil and gas development-related activities have resulted in positive and negative social, economic, and cultural impacts. The memo cited the need to quantify perceptions of both positive and negative impacts in those communities. As it was felt that traditional economic analysis was not adequate, an interdisciplinary approach to such a study was recommended. Specifically, the memorandum urged that a survey be conducted in these three communities to identify and quantify perceived impacts in such a manner that a comparative analysis could be done on the prevalence and distribution of different types of perceived impacts. MMS was asked to fund such a study that would then be conducted in cooperation with the AEWC and NSB in the form of direct consultation on the study design and review of all work by representatives of the AEWC and the NSB.

2.0 ISSUES EXAMINED

Oil and gas development is, in some respects, at the center of contemporary life on the North Slope, in ways both obvious and subtle. It is the only large-scale commercially viable natural resource-based development taking place on the North Slope today. It is the center of the private sector-driven portion of the regional economy, and it is also central to the public sector portion of the economy through its role as the ultimate source of a very large part of regionally generated public revenues. In a region with little in the way of local economic diversification, particularly in communities outside of Barrow, nearly all regional economic activity relates back to oil and gas development in one way or another. Directly or indirectly, oil and gas development has shaped a range of fundamental aspects of life on the North Slope from community settlement patterns to local governance. It has ultimately funded the physical transformation of the contemporary communities of the North Slope through sweeping infrastructure improvements and social transformation through a variety of means, including direct and indirect employment and income opportunities.

Despite its central importance to contemporary life on the North Slope, however, oil and gas development is very much seen as a double-edged sword, with issues of local versus non-local control over the shape of development of locally occurring natural resources at the fore, along with issues related to the social, cultural, and individual/personal consequences of rapid development and associated socioeconomic change. While oil and gas production that has directly influenced the North Slope has to date been largely confined either to onshore areas or areas within nearshore state waters, exploration and lease sale activities in federal offshore (outer

continental shelf [OCS]) waters have taken place over many years and production has recently begun to occur, if on a limited scale in relation to regional onshore and nearshore development.

Five key assumed implications of OCS exploration and lease sale activities have structured the data collection and research goals for this particular study:

- OCS activities are a special type of environmental event that may have particular risks and benefits for Iñupiaq society.
- Bowhead whale hunting traditions and practices are a core aspect of Iñupiaq lifestyles.
- Bowhead whale hunting interacts with agents of change, including OCS activities.
- Communities are experiencing social disruptions that may be related to the effects of change agents on social, cultural, and economic elements of Iñupiaq lifestyles.
- Iñupiat have a desired future for general aspects of their lives as well as for the interaction of bowhead whaling and change agents.

Research goals distilled from these respective implications are:

- To develop data about how communities evaluate OCS activities as an event in their environment and the overall risks and benefits associated with these activities.
- To describe variations in whaling among and within the project communities surveyed as a basis to identify factors that contribute to change.
- To examine the different types of change agents and their relative influence on whaling in an attempt to identify how OCS issues fit within the spectrum of change agents.
- To identify the types and relative importance of social disruptions in the respective communities and the perceived relationship of those disruptions to particular change agents.
- To quantify assessments of the desired futures for each community; how they wish things to be in the future for key aspects of their lives.

The resulting study is composed of three main parts:

- **An overview of the project communities of Barrow, Kaktovik, Nuiqsut, and Savoonga in terms of geographical and historical background and contemporary demographic characteristics.** This chapter also provides an introduction to subsistence bowhead whaling in the project communities and an overview of oil and gas exploration and development on the North Slope.
- **Four comprehensive profiles, one for each community, covering community background and history, community characterization, subsistence and cash economy, and the local nexus of whaling and OCS activities.** These community profiles benefited from input from secondary sources as well as from data gathered

through the ethnographic component of the research, with the dual objective of providing a relatively complete description of the local interplay of whaling and oil and gas development in its own right and providing a context for better understanding results from the survey effort.

- **A presentation of findings from the survey data collection effort.** The conclusions and discussion section at the end of this chapter summarizes the most significant findings and, where possible, compares these findings to those of previous survey research conducted in North Slope communities.

3.0 METHODOLOGY

This study employed three major methodological techniques in an effort to gather a holistic, complementary dataset as well as to provide a check on the data through a system of triangulation. The methodologies employed included:

- an archival research/literature review
- structured questionnaires
- limited ethnographic participant observation, including semi-structured and unstructured interviews

Three survey instruments were prepared and administered for adult householders (including elders), whaling captains, and high school students. Content for the surveys was developed based on research needs and shaped by information from two main sources: discussions with key individuals (leaders, whaling captains, elders) in Barrow and Anchorage, and the available body of relevant previous research.

The three surveys were carried out in the North Slope communities of Barrow, Kaktovik, and Nuiqsut, and the "control community" of Savoonga on St. Lawrence Island. Criteria for choosing the North Slope villages were based upon three factors: (1) proximity to potential or existing OCS development, (2) identity and recognition of the village as a whaling community with subsistence whaling rights, and (3) proximity of the village to the coast. The control village was chosen to provide a comparison of a coastal whaling community that has not been directly affected by the exploration for and/or development of oil and gas resources but continues to depend on whaling and subsistence.

Surveys sought information in five broad categories:

- Demographic characteristics;
- Quantitative and qualitative summaries of participation in bowhead whaling and other subsistence endeavors in each community;
- Resident's perceptions of the potential threats and benefits of OCS development to Iñupiaq traditions and subsistence;

- Changes in the quality of life in community, measured in both economic and traditional/cultural terms; and
- How individuals envision their future on the North Slope and St. Lawrence Island.

Table ES-1 shows the level of household survey response for each community, while Tables ES-2 and ES-3 show the level of whaling captain response and student response, respectively.

Table ES-1. Households and Elders Surveyed

Community	Population[a]	Total Households	Households Surveyed	Elders Surveyed
Barrow	4,429	672	163	22
Kaktovik	286	83	43	6
Nuiqsut	416	116	60	13
Savoonga	643	143	74	19
Total	5,774	1,014	340	60

[a] Total population of community from 2003 Borough Economic Profile and Census.

Table ES-2. Whaling Captains Surveyed

Community	Number of Whaling Captains	Captains Surveyed	Percent of Participation
Barrow	55	38	69%
Kaktovik	8	7	88%
Nuiqsut	8	7	88%
Savoonga	28	25	89%
Total	99	77	78%

Table ES-3. Students Surveyed

Community	Number of High School Students (Junior/Senior only)	Students Surveyed	Percent of Participation
Barrow	79	50	63%
Kaktovik	10	4	40%
Nuiqsut	16	5	31%
Savoonga	16	10	63%
Total	121	69	57%

4.0 COMMUNITY OVERVIEWS

Barrow

Barrow is the economic, transportation, and administrative center for the NSB. Located on the Chukchi Sea coast 10 miles south of Point Barrow from which it takes its name, Barrow is the northernmost incorporated community in the United States (Figure 4-1). The Native Village of Barrow became a federally recognized and chartered tribal organization in 1940. Barrow was incorporated in 1958 as a fourth-class city under the territorial administration (Alaska Department of Commerce, Community and Economic Development 2006a). After statehood, Barrow became a third-class city and then, in 1974, a first-class municipality (Smythe and Worl 1985).

Barrow is by far the largest community on the North Slope, accounting for about 62% of the borough population. The 2000 U.S. Census enumerated 4,581 people. It is also the most ethnically diverse North Slope community—along with Iñupiat and Caucasians, which form the largest minority group, Barrow has a mixture of black, Filipino, Korean, Hawaiian, Thai, Samoan, Hispanic, and other racial/ethnic groups. In 2000, approximately 57% of the population identified themselves as Alaska Natives.

Barrow hunters utilize the sea ice, the coastal zone, and inland areas for subsistence hunting. The community's location a few miles southwest of Point Barrow (Figure 4-2), the demarcation point between the Chukchi and Beaufort seas, offers superb opportunities for hunting a diversity of marine and terrestrial mammals and fishes (Galginaitis et al. 2001). Marine mammals and caribou are both extremely important for Barrow residents, and especially for Barrow Iñupiaq residents. The bowhead whale is hunted during the spring and fall migrations. Because of its size and the relatively wide distribution of the resources upon which its population depends, Barrow's community subsistence harvest varies less from year to year than for the smaller North Slope villages (Galginaitis et al. 2001).

Kaktovik

Kaktovik, also referred to as Barter Island, is a small community located on Barter Island in the extreme northeast portion of Alaska. The community is located within the Arctic National Wildlife Refuge (ANWR). The 2000 U.S. Census enumerated 293 people living in Kaktovik, 247 (84%) of whom are Native. Household economies rely upon both wage labor (and other income sources) and subsistence activities as vital components of an integrated system. The major employers are the NSB, the City of Kaktovik, and the village Native corporation. There are also a few private sector jobs and businesses separate from the Native corporations. These include retail stores, a hotel, and air carrier services. However, most employment is related to government or Native corporations (IAI 1990a).

Subsistence activities in Kaktovik make use of a unique set of resources. Because of Kaktovik's location, hunters have access to terrestrial, riparian, and marine resources, and make substantial use of all three. Fish caught both in rivers and in the ocean are important resources. Caribou are the most important terrestrial subsistence resource, but sheep, musk ox, and grizzly bears are also taken. Of the marine mammals, the bowhead whale is the primary subsistence resource, but seals

and polar bears are also taken (Jacobson and Wentworth 1982; IAI 1990b). Whaling takes place from the village in the fall and does not require camping. Subsistence activities, and especially activities surrounding the bowhead whale hunt, are central to the structural organization and cultural identity of Kaktovik residents.

Nuiqsut

The people of Nuiqsut call themselves Kuukpikmuit, or the "People of the lower Colville River" (BLM 2005). The name Nuiqsut recalls prehistoric and historic camps and settlements occupied by many families on the main channel of the Colville River that had been used traditionally as an area for hunting, fishing, trapping, and trading. Additionally, there was a seasonal trade fair at the mouth of the Colville River, where many Iñupiat from different areas would meet. Most residents in the area moved to Barrow when the Bureau of Indian Affairs mandated school attendance for children in the 1940s. However, former residents continued to use the Colville River area for subsistence purposes. The passage of the Alaska Native Claims Settlement Act led to the reestablishment of the community. In April 1973, the community of Nuiqsut was resettled by 27 families who embarked on a 150-mile trek from Barrow to the Colville River. Many of these people had lived in the Colville River area 25 to 30 years earlier and were "seeking an alternative to the accelerating urbanization of Barrow" (Libbey et al. 1979; cited in BLM 2005). These original resettlers traveled from Barrow with the supplies necessary for their life in tents for a year or more, as only one small cabin existed on the site before the move. One of the original founders (and the first mayor of Nuiqsut) took the first whale for Nuiqsut that fall, which was important for qualifying Nuiqsut as one of the original 9 (now 10) whaling communities that formed the AEWC.

Nuiqsut is not located directly on the coast; rather, it is about 16 miles inland on a channel of the Colville River, an atypical location for a whaling community. The residents of Nuiqsut harvest bowhead whales from Cross Island in the fall. In the past, they used Narwhal Island as a base and still have structures there (BLM 2005). Cross Island has cabins and equipment for hauling up and butchering the whales. The island is about 73 miles northeast of Nuiqsut and 92 to 109 miles away by boat, depending on which channel of the Colville River can be used to reach the ocean from Nuiqsut. When the water level in the river is high, the more direct route can be used. Areas west of Nuiqsut are also important for Nuiqsut residents, especially for subsistence (fish, caribou, and other resources). Nuiqsut is only connected to the road network in the winter, when an ice road from the Kuparuk oil field is constructed to Nuiqsut and points west in order to support oil and gas exploration and development activities (typically December through May).

Savoonga

St. Lawrence Island is located in the Bering Sea about 169 miles from Nome and less than 40 miles from the coast of Russia. The island has been inhabited for more than 2,000 years by the ancestors of the contemporary Siberian Yup'ik residents. Before a severe famine during the late 1800s, the island had a population of about 4,000 persons who lived in multiple villages on the coasts and small islands adjacent to the main island. One observer of this famine described it as follows:

> *The winter of 1879-80 was one of exceptional rigor in the Arctic … The ice closed in solid around St. Lawrence Island—so firm and unshaken by the giant leverage of wind and tide that all walrus were driven far to the southward and eastward beyond the reach of those unhappy inhabitants of that island, who thus unexpectedly deprived of their mainstay and support, seemed to have miserably starved to death, then with an exception of one small village on the north shore.* (Krupnik and Krutak 2002:261)

The population of St. Lawrence Island plunged to less than 500 individuals. As in quite a few other Alaska Native communities, reindeer were introduced about 1900 as one solution to the effects of prior famines. These herds grew and became a feature of social and economic life on St. Lawrence Island (Ackerman 1976).

The approximately 1,350 contemporary island residents live in two communities: Gambell and Savoonga. Savoonga is on the southeast coast of the island, about 40 miles from Gambell. Gambell is the older of the two communities; Savoonga grew from a reindeer herding camp established about 1916 to a village that incorporated in 1969.

Alaska Native residents of both Savoonga and Gambell belong to a distinct cultural group: Siberian Yup'ik. They speak a dialect that is one of three branches of the Yup'ik language group. Their language closely resembles the Yup'ik spoken among indigenous peoples of the Chukotka and Magadan regions of Russia, which is termed "Asiatic Eskimo" or "Siberian Yup'ik." Yup'ik residents of Chaplino, Anadyr, Providenija, and other Russian communities, who are occasional visitors to Gambell and Savoonga, communicate in their common language without difficulty. There is a history of visitation, even in historical times when there were political tensions between the United States and what was then the Soviet Union, that continues today. For example, during fieldwork for this project, a group of traditional dancers from Russia was visiting Savoonga.

Savoonga also identifies itself as a subsistence hunting community, especially hunting for whales and walrus. Savoonga is known as "The Walrus Capital of the World." Walrus are an important food source and the tusks are the primary medium for carving. Similarly, the traditional boats for whaling are made from split walrus skins, in contrast to the North Slope communities that use bearded seal ("ugruk") skins to cover their traditional boats. The prominence of the walrus in the physical environment and culture of Savoonga is an important and distinguishing characteristic of this community. Yet, a range of subsistence activities structures time and the activities of village residents. The seasonal cycle of subsistence activities, discussed below, is thus another distinguishing characteristic that contributes to the identity of this community.

5.0 OVERALL FINDINGS

Despite the economic hardships that the NSB communities and Savoonga are currently experiencing, most residents feel that the quality of life for their household has either stayed the same or improved. However, a large percentage of Barrow elders are pessimistic about the trend in the quality of life in their community; this negative assessment is likely the result of a perceived lack of jobs, increase in substance abuse and crime, and erosion of traditional values.

On the other hand, most Barrow elders, and the majority of elders in all other project communities, do not believe that their community has become worse as a place to live.

With regard to whaling captains' perceptions of the impacts of oil and gas development on Iñupiaq whaling, industry activity is designated as the major factor in the disturbance of bowhead migration patterns during the fall whaling season. The main change is deflection of the whales farther offshore by noise and other disturbances. This viewpoint is shared by whaling captains in Barrow as well as those in Kaktovik and Nuiqsut, which are completely dependent on the fall migration and which are the communities closest to oil industry activities. However, changes in the spring bowhead migration pattern are largely attributed to climate change. Changes noted by whaling captains in Savoonga, where no oil and gas development has occurred, include earlier arrival of the whales in the spring and an increase in the number of whales during the fall. Some Savoonga respondents attribute changes in both the spring and fall whale migration patterns to climate change, but most did not offer a reason for the changes reported.

The high percentage (59%) of surveyed whaling captains who responded that oil and gas development had a neutral effect or responded that they "don't know" suggests that many whaling captains have mixed feelings about the effects of this development. On the positive side, respondents commented on the increased availability of good jobs, higher household incomes, and tax revenues for NSB social services and capital infrastructure projects. Comments on the negative aspects of oil and gas development included increased difficulties in engaging in subsistence activities due to environmental disturbances and high levels of alcoholism and drug abuse.

Over two-thirds (69%) of the surveyed whaling captains in the NSB communities believe it is not possible to have oil development in offshore coastal areas and at the same time provide adequate safeguards to protect the environment and important cultural activities. The 1983 observation of Kruse et al. (1983), that "fears that offshore development will inevitably harm subsistence resources are both intense and widespread and themselves constitute an impact of development," is still true. However, the current survey found that whaling captains in Savoonga are less pessimistic, with only 28% of them indicating that OCS development is incompatible with environmental protection and cultural activities.

On the other hand, more than half of the whaling captains surveyed are confident about their community's capability to influence offshore as well as onshore oil and gas development. Perhaps this optimistic assessment is related to a perceived growing responsiveness by the oil industry to local concerns. For example, in comments following this question Barrow and Kaktovik whaling captains noted:

> *Conditions have been placed on offshore development. They* [the oil industry] *understand pretty well what we are doing out there. There is better communication with industry. They inform us of their activities through public hearings, etc.*

> *Villagers have long expressed a preference for onshore development; the companies have become more adaptable and addressed village concerns such as reducing impacts on caribou migration.*

However, there are also many whaling captains who are less hopeful about their community's capability to influence oil and gas development. As one survey participant stated:

> *They* [the oil industry] *just go through the motions of cooperating with us.*

With regard to changes in the influence, respect, and amount of sharing that elders experience, many Savoonga non-elders are concerned about changes in the role of elders, with 68% stating the influence of elders has decreased and 55% stating that respect for elders has declined. Fewer non-elders in the NSB communities expressed these concerns. Only a small percentage of the non-elders in the project communities indicated that sharing with elders, a traditional sign of respect, has declined. With regard to the perceptions of elders themselves, 46% of Savoonga elders and 33% of NSB community elders feel that their influence has diminished. A relatively high percentage (29%) of Barrow elders reported a decline in sharing.

Finally, the survey results indicate that, in comparison to the traditional Siberian Yup'ik community of Savoonga, households in the NSB communities depend less on subsistence resources (and therefore more on store-bought foods) to meet their nutritional needs. However, the survey results also revealed that the level of recruitment of young women and men into subsistence tasks in the NSB communities does not appear to be substantially different from that of their counterparts in Savoonga. Most notably, Barrow and Savoonga are similar in terms of age group participation in spring whaling. For some other subsistence activities there are dissimilarities in the amount of participation when comparing various age categories across villages; however, some of this variation may be due to inter-village differences in the availability of certain subsistence resources.

6.0 RECOMMENDATIONS FOR FURTHER RESEARCH

Over the course of this project, a number of opportunities for further research were discovered that could not be acted upon due to limitations in scope and resources. These recommendations also include proposed methodologies to ensure more efficient and productive future research:

- **An additional analysis of the existing dataset is proposed.** A systematic analysis of these responses would further document and categorize the observations of whaling captains, elders, youths, and others regarding changes in traditional values, knowledge, and practices that have resulted from oil and gas development and other external or internal forces.

- **A more complete survey of community youth and students is proposed.** The perceptions of young people are as much a result of life stage as they are of culture change. In like manner, different ages may have different perspectives on socio-economic change, such as change in income.

- **A more in-depth investigation as to the level of subsistence in the communities surveyed is proposed.** The results of more in-depth studies, such as the subsistence harvest surveys conducted by the Alaska Department of Fish and Game, are outdated for the NSB communities. Further study of the contribution subsistence resources make toward the diet of an average household on the North Slope would enable the MMS to grasp the magnitude of the risk associated with any OCS development effort that might impact the continuity and availability of these resources.

- **The development of an overall research plan for the NSB is proposed.** For over three decades the communities in the NSB have been the focus of a large number of survey research efforts. Various government entities have collected extensive data from households in these communities. However, various inconsistencies across data sets greatly reduce the usefulness of this data for time series analysis or synchronic, cross-sectional analysis. A comprehensive research plan would aim to: (1) integrate survey research efforts by using unique household identifiers; (2) develop a protocol for survey research that will create consistency between datasets; and (3) apply multi-method approaches in selected communities to derive the most value from the information collected.

CHAPTER 1
INTRODUCTION

1.1 STUDY ORIGINS

The origins of this study may be traced to a March 2000 memorandum from the Alaska Eskimo Whaling Commission (AEWC) and the North Slope Borough (NSB) to the Minerals Management Service (MMS) describing the need for additional research regarding cultural, social, and economic impacts to Alaska Eskimo subsistence communities from ongoing arctic oil and gas exploration and production (in addition to other research needed on biological and environmental factors involved in such exploration and production). A central point of the memo was that residents of the communities of Barrow, Nuiqsut, and Kaktovik perceive that oil and gas development-related activities have resulted in positive and negative social, economic, and cultural impacts. The memoalso cited the need to quantify perceptions of both positive and negative impacts in those communities. As it was felt that traditional economic analysis was not adequate, an interdisciplinary approach to such a study was recommended. Specifically, the memorandum urged that a survey be conducted in these three communities to identify and quantify perceived impacts in such a manner that a comparative analysis could be done on the prevalence and distribution of different types of perceived impacts. From the beginning, the critical role of bowhead whaling as a nexus between subsistence pursuits and offshore development was recognized. MMS was asked to fund such a study, which would then be conducted in cooperation with the AEWC and NSB in the form of direct consultation on the study design and review of all work by representatives of the AEWC and the NSB.

In response to the AEWC/NSB memorandum, in April 2001 MMS hosted "The Bowhead Whale Subsistence Hunt and OCS Oil and Gas Activities: A Research Design Workshop" for representatives of MMS, the AEWC, the NSB, and other interested parties. Among the topics of the workshop were:

- Nature of modern bowhead whaling and associated social practices
- Changes in the nature of contemporary whaling
- Social change and social and economic challenges in the North Slope communities, especially related to whaling
- Relationships between oil and gas activities and (a) whaling and (b) Iñupiaq[1] society generally

[1] The words "Iñupiat" and "Iñupiaq" will be found throughout the document. Generally, "Iñupiaq" is used as a singular noun, referring to an individual person, or it can be used as an adjective to describe a characteristic such as "Iñupiaq name." "Iñupiat" is a plural noun and refers to the people collectively. However, the use of these two words in the literature is inconsistent and highly variable. The authors of this text have tried to conform to the general rule, which is endorsed by the University of Alaska-Fairbanks, and apologize for any confusion.

This study grew out of the original memorandum, materials developed at the workshop, and additional agency input. From the beginning, the AEWC and the NSB were involved as study proponents, facilitators, and reviewers, and a range of other North Slope-based entities were directly involved as reviewers of the study design and/or critical study components such as the survey instruments themselves.

1.2 OIL AND GAS DEVELOPMENT AND BOWHEAD WHALING

As developed in detail in the body of this document, oil and gas development, in some respects, is at the center of contemporary life on the North Slope, in ways both obvious and subtle. It is the only large-scale commercially viable natural resource-based development taking place on the North Slope today. It is the center of the private sector-driven portion of the regional economy, and it is also central to the public sector portion of the economy through its role as the ultimate source of a very large part of regionally generated public revenues. In a region with little in the way of local economic diversification, particularly in communities outside of Barrow, nearly all regional economic activity relates back to oil and gas development in one way or another (although it may be fairly said that regional Native corporation-related entities have been distinctly successful building diversified holdings upon an oil and gas-based foundation). Directly or indirectly, oil and gas development has shaped a range of fundamental aspects of life on the North Slope from community settlement patterns (through making the resettlement of several villages, including Nuiqsut, a viable proposition) to local governance (dramatically increasing the degree of local political self-determination by making the NSB itself fiscally sustainable). It has ultimately funded the physical transformation of the contemporary communities of the North Slope through sweeping infrastructure improvements and social transformation through a variety of means, including direct and indirect employment and income opportunities. Despite its central importance to contemporary life on the North Slope, however, oil and gas development is very much seen as a double-edged sword, with issues of local versus non-local control over the shape of development of locally occurring natural resources at the fore, along with issues related to the social, cultural, and individual/personal consequences of rapid development and associated socioeconomic change. While oil and gas production that has directly influenced the North Slope has to date been largely confined either to onshore areas or areas within nearshore state waters, exploration and lease sale activity in federal offshore (outer continental shelf [OCS]) waters has taken place over many years and production has recently begun to occur, if on a limited scale in relation to regional onshore and nearshore development. Figure 1-1 illustrates current and planned 5-year OCS program areas near the communities covered by this study.

Also, as developed in detail in the body of this document, bowhead whaling is at the center of life on the North Slope as well, but in a very different sense. Subsistence is central to cultural and community identity within the region and whaling is the ultimate subsistence undertaking in a number of ways. Whaling is at once different from everyday life and the center of everyday life. With its complex activities, whaling perhaps provides to the outsider the most obvious example of the intersection of sociocultural systems and the natural world as the most distinctive aspect of life in the whaling communities. Whaling is integral to local social systems, as the roles and responsibilities associated with whaling shape relationships between captains and crews, crews and communities, communities and the region, and beyond. Values and beliefs about appropriate

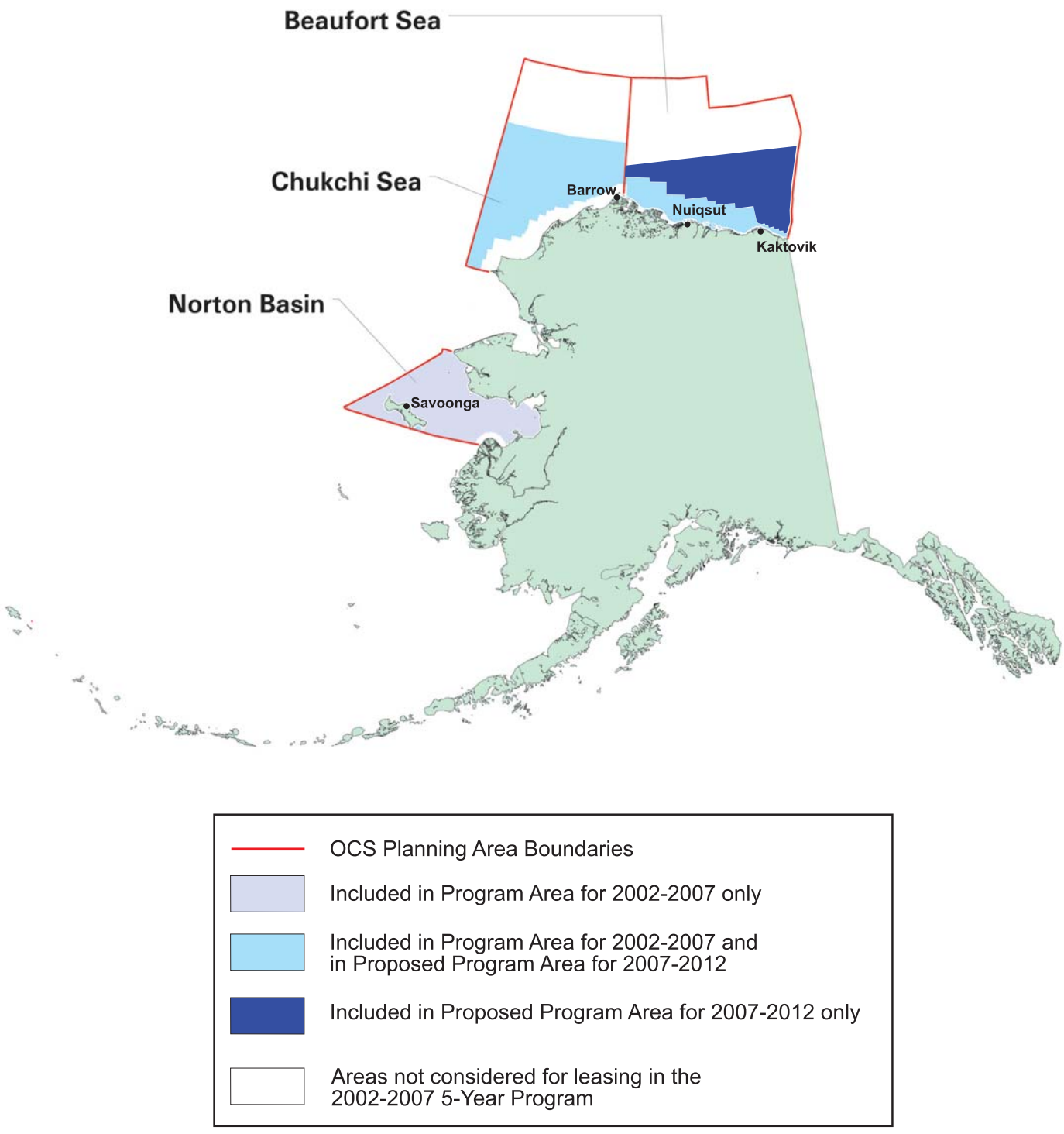


Figure 1-1
Final Program OCS Planning Areas and Study Communities

relations between people and resources come to the fore in whaling, and the process of whaling provides a marked context for the communication of ideas and values through actions and interactions across generations. By practice and by law, whaling differentiates between Native and non-Native life. Whaling provides a thread of continuity with a traditional past and is an integral part of the fabric of contemporary life. Whaling is tied to a timeless seasonal round on the North Slope, and different communities come into contact with bowhead at different points in their annual migration. Figure 1-2 provides an idealized interpretation of whale migration patterns in relationship to local communities.

While both oil and gas development and whaling are central to life in the region, the intersection of the two in the offshore environment is seen as highly problematic within the relevant communities. Although little in the way of offshore development has occurred to date, significant exploratory and lease sale activity has taken place relatively close to the whaling areas of the study communities, as shown in Figure 1-3.

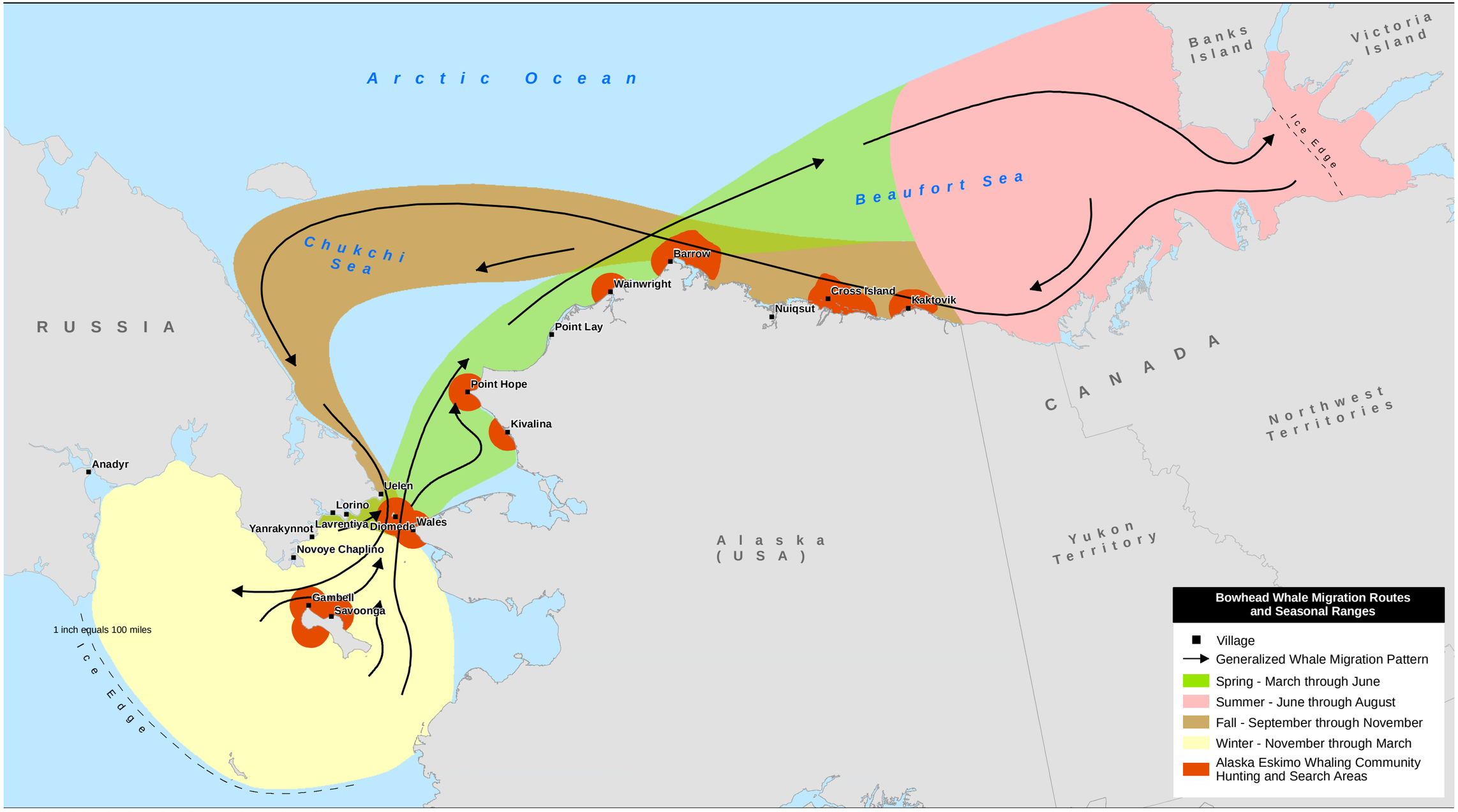
1.3 ISSUES EXAMINED

The background summarized above has implications for the issues to be examined by this work. Some of the key implications that structured the data collection effort may be described as follows:

- *OCS activities are a special type of environmental event that may have particular risks and benefits for Iñupiaq society*. OCS activities represent an evolution of oil and gas activities that has different implications than prior types of development. The potential impact of an oil spill and the potential effects of exploration, construction, and production activities on bowhead whales make OCS development especially threatening for key institutions such as whaling. Iñupiaq assessments of the overall risks and benefits of these types of activities are necessary in order to understand how risks and threats can be mitigated and benefits enhanced. This project develops data about how communities evaluate OCS activities as an event in their environment and the overall risks and benefits associated with these activities.

- *Bowhead whale hunting traditions and practices are a core aspect of Iñupiaq lifestyles*. The social organization, cultural traditions, and practices of whale hunting express a unique element of Iñupiaq communities. It might be termed an "indicator institution"[2] because of how whaling integrates fundamental features of Iñupiaq life: kinship, social status, sharing, cultural identity, personal and community well-being, and community cooperation. Consequently, this study develops a description of participation in whaling to facilitate an understanding of the interconnections among whaling and other social and cultural institutions. Variations in orientations to and participation in whaling among and within project communities are described. This provides a basis to identify factors that contribute to change in whaling participation and traditions.

[2] By institution we mean a pattern of practice or interaction that is relatively stable over time and is structured by cultural values.



Source: MSS 2006; North Slope Borough Dept of Planning and Community Services 2003.

100 50 0 100 Miles

Figure 1-2
Bowhead Whale Migration and Subsistence Hunting Areas

Path: P:\2001\1K118 Bowhead Whaling\5GIS\Mxd\Study_Maps\Bowhead_Figures\Whale_Seasonal_Ranges.mxd, 08/15/07, leej

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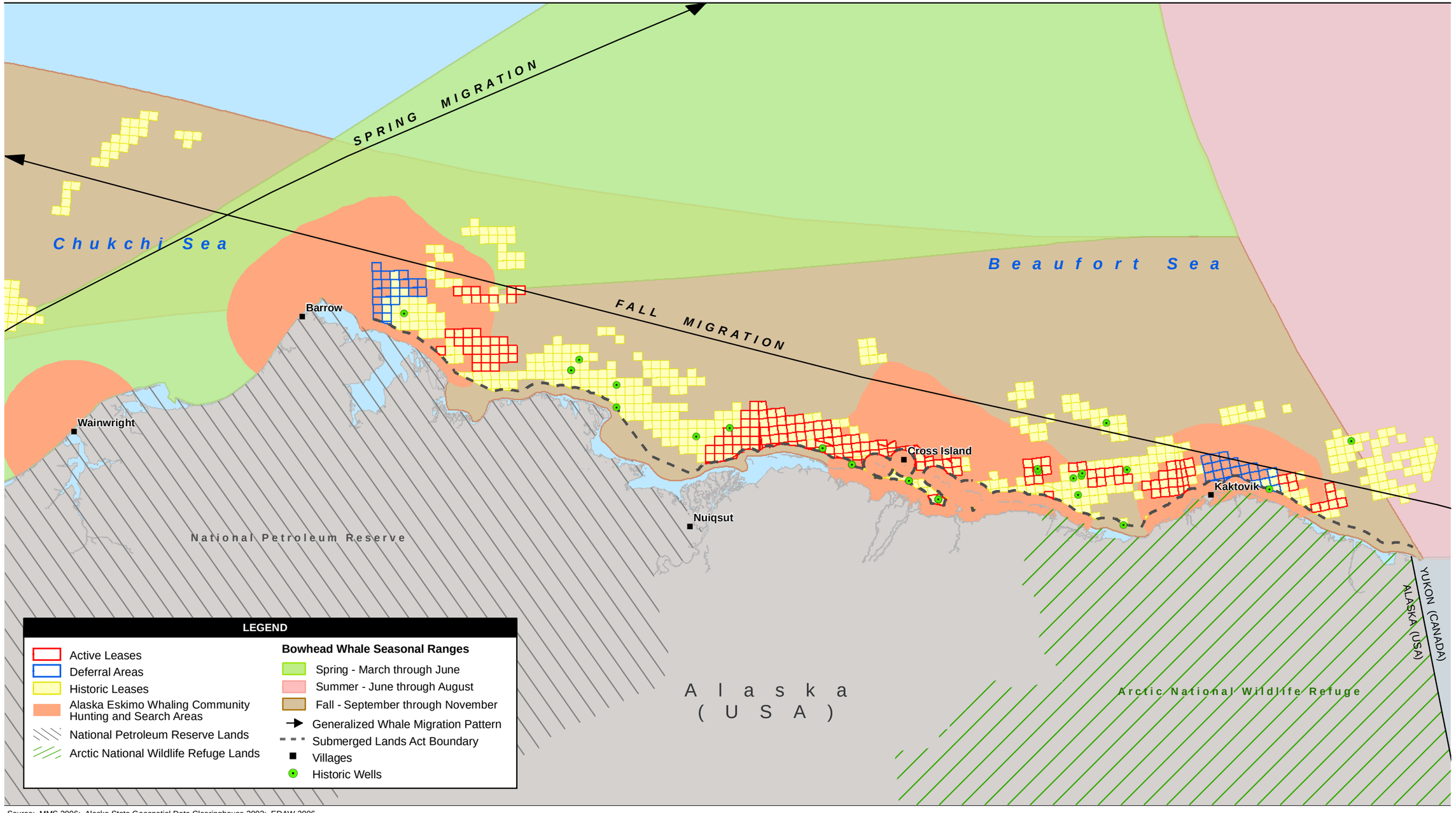

Source: MMS 2006; Alaska State Geospatial Data Clearinghouse 2002; EDAW 2006.

Figure 1-3
Active and Historic Federal Leases within Whale Migration Routes and Seasonal Ranges

Path: P:\2001\1K118 Bowhead Whaling\5GIS\Mxd\Study_Maps\Bowhead_Figures\Historic_Leases_Whale_Migration.mxd, 11/06/07, leej

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- *Bowhead whale hunting interacts with agents of change, including OCS activities.* There are different types of potential change agents Iñupiat have experienced since contact with non-Native people, including wage employment; technological changes in hunting, fishing, and household implements; governance related to the Alaska National Interest Lands Conservation Act (ANILCA) and the Alaska Native Claims Settlement Act (ANCSA); education; health care; religion; and oil and gas development. These types of change agents are likely to have different influences on distinct elements of Iñupiaq society and culture (e.g., kinship, religion, social networks, cultural identity, etc.). Change agents that influence participation in whale hunting are likely to radiate to other aspects of Iñupiaq social, cultural, economic, and psychological life. Alternatively, the cultural importance of subsistence whaling may result in resistance to major change in this institution. Consequently, an examination of the different types of change agents and their relative influence on whale hunting was undertaken to identify how OCS issues fit within the spectrum of change agents.

- *Communities are experiencing social disruptions that may be related to the effects of change agents on social, cultural, and economic elements of Iñupiaq lifestyles*. The literature about development in Iñupiaq communities suggests that some changes (e.g., modern housing, sanitation, health clinics, and wage employment) have resulted in what might be termed an increased standard of living and improved personal health and well-being. However, Iñupiat perceive that change agents have also contributed to anxiety, stress, and social disruptions that adversely impact individuals, families, and communities (Albert 2001). OCS or "offshore industrial activity" is also perceived as a specific and powerful change agent with potential for significant adverse effects for communities, families, and individuals. This work attempts to identify the types and relative importance of social disruptions as understood by the Iñupiat and the perceived relationship of those disruptions to particular change agents.

- *Iñupiat have a desired future for general aspects of their lives as well as for the interaction of bowhead whaling and change agents*. This work also seeks to identify Iñupiaq assessments of their desired futures, how they wish things to be in the future for key aspects of their lives.

1.4 ORGANIZATION OF THIS DOCUMENT

Following this introduction, the document is structured as follows:

- Chapter 2 provides information on the research approach and methodology utilized in this study, including the archival/literature review, survey research, and ethnographic methods.

- Chapter 3 provides an overview of the project communities of Barrow, Kaktovik, Nuiqsut, and Savoonga in terms of geographical and historical background and contemporary demographic characteristics. This chapter also provides an introduction to subsistence bowhead whaling in the project communities and an overview of oil and gas exploration and development on the North Slope.

- Chapter 4 provides comprehensive profiles of the project communities, covering community background and history, community characterization, subsistence and cash economy, and the local nexus of whaling and OCS. These community profiles benefited from input from secondary sources as well as from data gathered through the ethnographic component of the research, with the dual objective of providing a relatively complete description of the local interplay of whaling and oil and gas development in its own right and providing a context for better understanding results from the survey effort.
- Chapter 5 presents findings from the survey data collection effort. The conclusions and discussion section at the end of this chapter summarizes the most significant findings and, where possible, compares these findings to those of previous survey research conducted in North Slope communities.
- Chapter 6 provides a list of references cited.
- Appendix A provides a review of the literature on the historical importance of whaling in the project communities.
- Appendix B provides household survey results in tabular format (provided on CD).
- Appendix C provides whaling captain survey results in a narrative format (provided on CD).
- Appendix D provides whaling captain survey results in a tabular format (provided on CD).
- Appendix E provides the household and whaling captain survey instruments and the ethnographic protocol (provided on CD).

CHAPTER 2
RESEARCH METHODOLOGY

Detailed information on the initial (pre-implementation) research approach is available in an earlier submitted research design. That approach was followed closely in the actual implementation of the study. This section summarizes the overall research methodology and describes those instances where the study as carried out varied from the initial design.

2.1 ESTABLISHING COMMUNITY COOPERATION, LIAISON, AND INPUT

As noted in Chapter 1, this particular study grew directly out of an expressed research desire put forward by the NSB, led by then-mayor Ahmaogak's office, and the offices of the AEWC. From the groundwork laid by these initial research proponents, the project implementation depended upon establishing working relationships through face-to-face contacts and liaison relationships with key entities and persons in the communities. It is important to note, however, that the AEWC remained an important ongoing point of contact for the duration of the study because of the topic of the work. Similarly, the NSB mayor's office also remained an important cooperating entity over the life of the project because of the NSB's overall political importance for the region. Points of contact were established early on with community mayors/city councils, village councils, and village whaling captains groups. The point of developing these working relationships was to ensure that participating communities have the opportunity to provide suggestions and direction for the topics addressed by this work. Further, a central regional/local point of contact was established at Ukpeagvik Iñupiat Corporation in Barrow to allow participants, or potential participants, access to project information in both English and Iñupiaq on an as-requested basis in addition to the more formal presentations that occurred in each of the study communities.

The project solicited community input regarding the content of the study early in the process during an initial contact period and then through ongoing contacts with key persons in study communities. The initial contact was made by telephone, followed by face-to-face communication in selected cases, and provided the research team with relevant information about the participating communities. In addition to reflecting proper etiquette, these initial contacts helped the study team gather input regarding the pre-tests of the surveys from the community, and perspectives on individuals within each study community who were politically central to the life of the community and most knowledgeable in terms of traditional/cultural matters. This information helped identify initial "key informants" for potential participation in the ethnographic portion of the work. The team also asked initial contacts what were the most important issues/problems they perceived as affecting, or having the potential to affect, their community. These individuals also provided the initial point of contact for distribution of information to the communities about the study and its purposes, as well as for implementing either community meetings or focus groups to gather community input and community feedback concerning any problems that may arise as a result of the study.

2.2 TRIANGULATION

This project utilized a triangulation methodology in several different senses. Traditionally, there are four forms of triangulation: (1) data triangulation uses different data *sources*; (2) methodological triangulation uses different research *methods* about a common topic; (3) investigator triangulation uses *different researchers* to examine the same issue; and (4) theoretical triangulation uses different *theoretical frameworks* to examine an issue or problem (cf. Denizen 1978). This work employed all of these forms of triangulation to some degree to facilitate the examination of the convergence or divergence of findings about a particular topic in a particular community, as well as across communities. That is, *data* triangulation was used in each of the communities by gathering information from diverse sources (e.g., whaling captains, elders, women, etc.). Also, this project utilized *methodological* triangulation by employing three different research methodologies: archival/literature review, surveys, and ethnographic techniques. These are each discussed in turn later in this chapter. *Investigator* triangulation was implemented by using several different staff for survey and ethnographic data collection. Finally, *theoretical* triangulation, while not a methodology per se as discussed in this section, may be achieved by the application of different theoretical frameworks to the data collected to address each study topic.

Over the course of this study, archival and survey findings were used to outline the structural dimensions of an issue, whereas the ethnographic methods were utilized to provide information about the meaning of those findings, what is often referred to as providing context for a problem. In this instance, information gathered through ethnographic efforts fed directly into the community profiles as presented in Chapter 4. These profiles contain not only descriptive information about the communities, but also information on sociocultural dimensions of whaling within the context of the individual project communities.

2.3 SECONDARY SOURCES: ARCHIVAL RESEARCH/LITERATURE REVIEW

The first half of the literature survey presented in Appendix A draws on an array of writings to provide a historical overview of the whaling tradition. It includes selected references depicting the pre-contact bowhead whale hunt and relating the major developments affecting the hunt up to the present. This part of the review concludes with a compilation of publications describing the current sociopolitical context of subsistence whaling in Alaska. The historical overview is written in the past tense for stylistic and editorial reasons. Consequently, it may obscure significant aspects of historical subsistence whaling that have continued up to the present. To remedy this situation, the second half of the review focuses on literature describing the contemporary significance of whaling for the communities of interest. The literature selected examines the importance of the bowhead whale hunt for the formation and maintenance of Iñupiaq and St. Lawrence Islander cultural identities.

The literature survey does not purport to be a comprehensive review of all the literature available on the subject of subsistence whaling in the project communities. The culture of the relatively small number of Alaska Natives who traditionally hunted bowhead whales has long been a research focus of social scientists, and the accumulated literature is vast. However, it is believed by the authors that the major written sources of information were consulted in the survey.

Members of the study team have personal collections of regional literature that include a significant number of the most centrally important sources. Repositories (primarily libraries and agencies) in Anchorage and Barrow were also primary targets of the literature search. Finally, a computer search of potential sources was conducted, including a review of the on-line annotated bibliography compiled by Marquette (2002).

2.4 SURVEY METHODOLOGY

2.4.1 Overview of Approach

This study was developed, in part, as a response to concerns among North Slope residents regarding OCS exploration and development activities. Three broad areas of concern were identified by the study team based upon input from stakeholders in the community and MMS. These key areas of concern guided the development of questions for three survey instruments that were to be administered in four study villages. The three areas of concern were:

1. Physical and acoustic effects of seismic testing; movement of barges, aircraft, transport vessels, and platforms; and other OCS-related development activities. What are the effects of development on subsistence whaling and subsistence hunting, generally, and are these activities resulting in changes to the practice of whaling?

2. Social, cultural, and economic impact of energy development. While the benefits have clearly been recognized (growth in jobs, increased revenue to the region, improved public services and infrastructure), the negative effects of industrialization and its impact on Iñupiaq culture are less understood. What is the perception and level of anxiety over increased restrictions on hunting, reduced participation in cultural activities, and more prevalent drug and alcohol use?

3. Fears about what is happening to the health and well-being of the North Slope Iñupiaq family, and, more specifically, participation and recruitment of youth in subsistence-related activities. The survey sought to provide a better understanding of these issues in the context of communities that have gone through substantial change and modernization in a short time.

An integral part of the research effort was the administration of three surveys that sought to solicit information that could not be obtained solely through ethnographic research. Surveys were prepared for whaling captains, adult householders and elders, and high school students (junior and senior standing). The survey instruments are described below.

2.4.2 Survey Instruments

Three survey instruments were prepared and administered for adult householders (including elders), whaling captains, and high school students. Content for the surveys was developed based on research needs and shaped by information from two main sources: discussions with key individuals (leaders, whaling captains, elders) in Barrow and Anchorage, and the available body of relevant previous research.

2.4.2.1 Survey Development and Content

Based upon input from the AEWC, relevant NSB departments and offices, the Iñupiat Community of the Arctic Slope, MMS, and from contacts made in the community contact phase of the project, the survey instruments focused on changes that may have occurred over time in subsistence and other traditional cultural activities, including but not limited to whaling, hunting other marine and land mammals, fishing, gathering, patterns of sharing among and between communities, language usage, visiting with others in the community, etc. The surveys were also designed to elicit respondents' perceptions about changes taking place within the community in terms of residents' relationships to governing institutions, educational institutions, and the extent to which any changes might be related to OCS oil and gas development activities. The surveys also elicited respondents' perceptions of a desired future for their community, as well as their thoughts about the likelihood of that vision coming to fruition. Finally, the surveys included basic demographic and socioeconomic information used to assist in the analysis of the data and explanation of variations within and between sectors of the communities.

The three surveys were carried out in the North Slope communities of Barrow, Kaktovik, and Nuiqsut, and the "control community" of Savoonga on St. Lawrence Island. Criteria for choosing the North Slope villages were based upon three factors: (1) proximity to potential or existing OCS development, (2) identity and recognition of the village as a whaling community with subsistence whaling rights, and (3) proximity of the village to the coast. The control village was chosen to provide a comparison of a coastal whaling community that has not been directly affected by the exploration for and/or development of oil and gas resources but continues to depend on whaling and subsistence.

A description of the research design plans for the survey is provided in the "Supporting Statement" prepared for the U.S. Office of Management and Budget (OMB), which may be found in Appendix E. The Supporting Statement is designed to facilitate a survey review process, as required by 5 CFR 1320.11. The OMB must approve surveys for federally funded studies if the collection of information requires a significant time-burden on residents affected by the study.

Copies of the household and whaling captain survey instruments can also be found in Appendix E. The student survey was not included for reasons explained in Section 2.4.3.3.

Surveys sought information in five broad categories:

1. Demographic characteristics
2. Quantitative and qualitative summaries of participation in bowhead whaling and other subsistence endeavors in each community
3. Residents' perceptions of the potential threats and benefits of OCS development to Iñupiaq traditions and subsistence
4. Changes in the quality of life in community, measured in both economic and traditional/cultural terms
5. How individuals envision their future on the North Slope and St. Lawrence Island.

The household survey instrument was developed to collect information in these categories from the universe of adult heads of households and/or elders in the villages outside Barrow, and from a stratified sample of households and/or elders in Barrow. The intent of the household/elder survey was, in part, to gather information on the effects of the oil and gas activities on individuals, households, and elders in relation to whaling, subsistence, language, employment, social relations, and other facets of community life. Households were loosely defined as co-residents (or single individuals) living in a dwelling and sharing domestic functions, e.g., cooking.

The whaling captain survey, intended to be utilized for the available universe of AEWC registered whaling captains, while overlapping with a number of areas on the household survey, focused on whaling captains' specific knowledge of the organization of whaling activity, the patterns of change in that organization, the changes that are occurring in the village at-large, and any change resulting from OCS activity. Through interviewing whaling captains we hoped to gain information about patterns of participation in activities related to whale hunting, how crew members are recruited and trained, the impacts of oil and gas development on Iñupiaq whaling and other subsistence activities, and their perceptions about the future of their communities and their way of life.

The student survey asked about the social, cultural, and economic effects of oil and gas development; their attitudes about local authority figures and traditional norms and practices; and their involvement in current and future bowhead whaling activities and other aspects of village life. A combination of low participation rates (unavailability) and a high rate of non-completion of the surveys rendered the results from the student surveys tenuous, at best. As a result, data analysis could not be completed for the student surveys without further effort directed into obtaining additional surveys. Therefore, no results from the student survey are included in this study.

2.4.2.2 Remuneration of Survey Respondents

Respondents were paid for taking part in the survey. The participants were remunerated in part as a token of appreciation for the effort they put forth in taking the survey and in part to reduce non-response rates. Household and high school survey respondents were paid $40, and whaling captains and elders were paid $50 for participation in the survey (with the higher amount given in recognition of the respondent's status in the community).

2.4.2.3 Data Confidentiality

Information obtained from individually identifiable survey respondents is considered confidential. Detailed data are presented in the form of cumulative totals, such that individuals cannot be identified. Similarly, responses to open-ended questions are tabulated but not attributed. Illustrative quotes utilized throughout the report are not attributed, though the speaker is typically characterized by membership in one of the survey pools to provide interpretive context. Each survey participant signed a consent form (Appendix E), and all high school students were required to obtain a signature for participation from a parent or guardian. Participation was completely voluntary.

2.4.3 Sampling Strategy

Detailed information on the sampling strategy, topical coverage of survey instruments, and standard errors is found in the OMB Supporting Statement (Appendix E). The following provides a simplified overview of the sampling strategy employed in all four villages for the three survey instruments.

2.4.3.1 Household Survey

A stratified random sample of 20% of the households in each village, based on census populations, was selected for the household/elder surveys. The household survey used a random or probability sampling strategy of Alaska Native households. The 20% sample allowed us to gain a representative cross-section of the population in each village. A total of 340 households were surveyed for this study.

For each North Slope community, a geographic information system (GIS) map was generated from information gathered during a 2003 survey that enumerated every structure in the community. The survey, which was a household census in nature, field verified these GIS maps in the smaller communities of Nuiqsut and Kaktovik by knocking on every door to see if the structure was an occupied household. The results of this validity test were then communicated back to the NSB's GIS department, which then updated their coverage. The field team took hard copies of these updated files, labeled each occupied structure, and assigned each with a unique integer number, beginning with the northwest quadrant of the community. The research team then used a table of random numbers to select enough households (to control for refusals, etc.) to complete the required sample for each community. Non-Native households were excluded from the survey. The 672 households listed as the universe in Table 2-1 for Barrow, for example, represents Alaska Native households. Since each of these communities is characterized by Alaska Native populations of greater than 90%, exclusion of the non-Native households is less problematic. The definition of "Alaska Native" was based on self-identification by the respondents or the reported existence of Alaska Natives in the household. More restrictive definitions, e.g., blood quantum or membership in a Native corporation, were considered too imprecise and contentious. Table 2-1 identifies the number of households surveyed in each community.

Table 2-1. Households and Elders Surveyed

Community	Population[a]	Total Households	Households Surveyed	Elders Surveyed
Barrow	4,429	672	163	22
Kaktovik	286	83	43	6
Nuiqsut	416	116	60	13
Savoonga	643	143	74	19
Total	5,774	1,014	340	60

[a] Total population of community from 2003 Borough Economic Profile and Census.

In Savoonga the most recent map from Kawerak's planning department (the regional non-profit corporation that includes St. Lawrence Island) is from 1994. Using this as a baseline, the research team contacted the Indian Health Service utility department for more current maps showing service hook-ups for all dwellings within the community and to the State of Alaska's Department of Community and Economic Development for infrastructure updating (i.e., add the new housing projects completed since 1994). The research team ground-truthed the updated map for current structure validity and then took this updated map to the local Indian Reorganization Act (IRA) Village Council to verify which structures are occupied by families. Structures on this final map were also numbered beginning in the northwest quadrant and a sample, using a table of random numbers, was drawn.

A sample of elders was drawn for interviews in Barrow and Savoonga and the universes of elders in each of the other two villages were targeted for interviews. The sample was determined using a modified form of a Delphi technique. Sixty elders were surveyed using the same questionnaire as the household survey, starting with a sample of 20 elders each drawn from the larger communities of Barrow and Savoonga. Elders were identified using a combined approach; several well-informed individuals in each community were asked to list those in their community who they consider to be elders. All elderly are not elders (Wilson 1996), and the status of elder is attributed to individuals of both sexes who exhibit sound judgment, who have detailed skills and experience in subsistence activities, and who may be noted for their mediating skills. At the same time, for the purposes of senior programming, elders are defined by the NSB by age. In the field, the research team identified elders by cross-referencing NSB elder lists with lists of elders generated by local individuals following local conventions of elder identification.

2.4.3.2 Whaling Captain Survey

All AEWC-registered whaling captains in each of the three North Slope study communities and the control community of Savoonga were targeted for interviews. Ninety-nine whaling captains reside in the four villages. Table 2-2 shows the number of registered captains in each village and the total captains surveyed. Due to the unavailability of several whaling captains, we achieved a 78% response rate among the whaling captains; with 77 of 99 agreeing to be interviewed. In Barrow 69% (38/55) participated in the study; 88% (7/8) participated in Kaktovik, 88% (7/8) in Nuiqsut, and 89% (25/28) in Savoonga. Before identifying a whaling captain as unavailable, surveyors were required to attempt to contact each captain three times; after the third attempt, the whaling captain was considered unavailable. All surveyors conducting the whaling captain interviews were master's and PhD-level ethnographers with knowledge of the North Slope and the issues pertaining to bowhead whaling and OCS activities.

Table 2-2. Whaling Captains Surveyed

Community	Number of Whaling Captains	Captains Surveyed	Percent of Participation
Barrow	55	38	69%
Kaktovik	8	7	88%
Nuiqsut	8	7	88%
Savoonga	28	25	89%
Total	99	77	78%

2.4.3.3 Student Survey

Students were asked about the social, cultural, and economic effects of oil and gas development; their attitudes about local authority figures and traditional norm and practices; and their involvement in current and future bowhead whaling activities and other aspects of village life. All junior and senior students enrolled in the high schools for all four sample communities were contacted to participate in the survey. Their contact information was derived from lists provided by the local school district. Interviews were conducted at the students' homes. All 121 senior and junior high school students in the four communities were to be interviewed. For a variety of reasons, however, only 69 students completed the surveys (e.g., unavailability, refusals, and incomplete surveys). Therefore, the data gathered were unrepresentative of the total population and could not be reliably used in this study. Table 2-3 below shows the breakdown of junior and senior students in each village.

Table 2-3. Students Surveyed

Community	Number of High School Students (Junior/Senior only)	Students Surveyed	Percent of Participation
Barrow	79	50	63%
Kaktovik	10	4	40%
Nuiqsut	16	5	31%
Savoonga	16	10	63%
Total	121	69	57%

2.4.4 Tracking System

A separate Access database program was created for each survey instrument using the program's "form builder" feature. Each interviewer had a laptop in the field to directly enter responses into the database. Each interview had a unique identification code, which was written on each hardcopy survey and entered into the database to assign each entry to an individual. Every household in the sample was assigned a unique number, and every whaling captain in the sample was also assigned a unique number. Where whaling captains were also elders, the same number was used for both surveys. These numbers were also entered onto the hardcopy of the survey questionnaires. All original whaling captain surveys were scanned for electronic record-keeping and the hardcopies are maintained by EDAW and are kept confidential. Circumpolar Research Associates have maintained hardcopy originals of all household and student surveys and will be transferring these for EDAW to maintain in a master file. This tracking system was developed to maintain respondent anonymity. Each question was entered into the database based upon a numerical coding of response options. For example, if a "yes" answer was recorded on the survey, the surveyor would enter the corresponding number to the answer, such as 1=yes. Where open-ended questions occurred, comments were transferred from the hardcopy into the database for the specific question. All data, after being entered into the Access database, was collected and transferred to a Statistical Package for the Social Sciences (SPSS) program.

Individual codes for three different categories of missing data were developed; this enabled the analysts to discern between the precise type of non-response. Missing data were categorized as either "don't know," "not applicable," or "declined to answer" to enable better interpretation of results. All open-ended questions were recorded in an Access database and transferred to an SPSS file. Inter-rater reliability was accomplished through training sessions; interviewers were instructed to be aware of any implied metrics within open-ended questions.

2.4.5 Survey Data Analysis

All data analysis was conducted after transferring the Access databases for all four villages and three survey instruments to SPSS files. SPSS was used to set up the questionnaires based on the Access database created for this project.

The SPSS setups were delivered to Circumpolar Research Associates, which linked them to the appropriate database files. After some initial analysis of frequencies, the organization of the files was modified by block copying records from other files into new SPSS files. The analysis in Chapter 5 was completed by running SPSS frequencies on all variables (frequency tables for all survey questions are provided in Appendices B and D) and, where appropriate, a number of summary measures including the mean, mode, standard deviation, and "sum" were obtained. The second round of analysis involved creating new variables and indices through the "recode" and other SPSS functions. A number of subsidiary files were created using the SPSS "select if" function to generate subsets of community and regional samples (e.g., Barrow elders, North Slope elders, etc.). The analysis of survey results presented in Chapter 5 consists of a series of bivariate investigations and "partial table" analyses.

Slight variations occurred in sample sizes across reporting formats. This is because in the computational analysis, missing data (don't know, not applicable, etc.) were eliminated from the calculations, and where bivariate statistical procedures were used, pairwise deletion occurred. Also, due to the number of possible combinations between the 100+ questions, only some survey questions are addressed in this report. Some key open-ended questions were coded and are presented with the other survey results in Chapter 5.

2.5 OBSERVATIONAL AND ETHNOGRAPHIC METHODOLOGY

Along with archival research and the survey approach, observational/ethnographic methods were used to round out the study's methodological triangulation. This section briefly summarizes the observational and ethnographic methods used.

2.5.1 Overview of Approach

Limited "ethnographic" or "observational" research was conducted for this project. In general, ethnographic methods combine semi-structured and unstructured interviews and observations to understand topics from the point of view of social actors within a particular historical, cultural, and socioeconomic context (Emerson, Fretz, and Shaw 1995; Spradley 1979; Schensul, Schensul, and LeCompte 1999; Sanjek 1990; Bernard 1995). The ethnographic approach used for this work has the assumption that the task is to discover how participants construct or think

about a particular topic such as the relationship of offshore oil development and whaling. Implementation of this approach entails specifying the data collection topic areas and the approach to eliciting information, identification of persons knowledgeable about the topic area, and analysis of the information for presentation. Execution of each of these implementation tasks is briefly summarized in this section.

The primary goals of this component of the research were several. This component was intended to provide information to supplement the descriptive adequacy of community participation in traditional activities, including subsistence whaling; provide rich data to serve as a validity check for information obtained through the survey instrument; and assist in placing the survey findings within a broader descriptive and explanatory context. The survey instrument, by its nature, focused on a relatively narrow set of questions and responses, such as indicator measures of perceived change and the relationship between variables. The observational research component was intended to simultaneously collect a wider range of information in a less formally structured context. This also allowed local research participants to help define the topics of most critical concern, and to provide input on the expression of the terms used to discuss them. This served as a constant validity check for the survey instrument throughout the project and enriched the interpretation of survey results. Importantly, this component of the research allowed local participants to place the survey into a more meaningful context and thus increase local understanding of the research process and the place of the individual contribution of legal participants within the larger context of the study. In practical terms, it also served as a logistical means to help locate and evaluate existing sources of information that can only be found in the community settings.

"Standard" ethnological methods were not strictly applicable to this project, as extended participant observation was not part of the scope of this research. However, by combining efforts under this study with those of other ongoing projects (the two U.S. Department of the Interior/MMS projects on Cross Island Whaling) and utilizing team members with cross-cutting research experience on the North Slope, the project directly benefited from first-hand observation and interviews conducted during multiple Cross Island whaling seasons of several weeks each. This experience contributed directly to the "thick description" of contemporary Iñupiaq whaling in Nuiqsut, and to the examination of changes in Nuiqsut whaling through time. Since Nuiqsut, as representative of mid-Beaufort Iñupiat, only renewed whaling after development began in Prudhoe Bay, Cross Island whaling has in a sense been in a state of constant development in conjunction with, and adaptation to, petroleum development. This component of the observational research allowed the study team to more fully develop this aspect of the issue and apply lessons learned to other communities.

In addition, trips to the villages in conjunction with other project tasks, primarily survey-oriented tasks, were used to conduct key person and ethnographic interviews and observations of village activities. Limited observations of whaling or whaling-related activities in Kaktovik, and to an even more limited extent in Barrow and Savoonga, allowed some comparison to the more fully developed Nuiqsut case. Where feasible, field trips were scheduled to coincide with significant community activities (whaling feasts, holidays), but it is recognized that communities may prefer that such trips be scheduled for other times and it is a truism that the "best times" for community observations may not be those "best" to conduct interviews.

2.5.2 Ethnographic Protocol

Collection of the interview and observation data was guided by an interview protocol (Appendix E) that specified broad topic areas and follow-up probes. The broad topic areas specified include social organization of whaling (e.g., roles and activities); community and whaling (e.g., community identity, festivals, sharing); assessments of social conditions and change; and assessments of the interaction of whaling and offshore oil development. The first two broad topics developed information about current and historical whaling practices and the cultural meanings about whaling and its significance for contemporary Iñupiat/Siberian Yup'ik communities. The social conditions and change topic developed information about the sociohistorical context of whaling and the agents of change affecting current conditions in study communities. The final topic developed information about assessments of how OCS activities and whaling interact and if there are particular threats or incentives associated with these interactions.

Interviews began with the most general questions and progressed to details suggested by the responses of the participants and the discussion guide. This strategy favors the use of open-ended questions that allow participants to structure responses from their perspective (Spradley 1979; Agar 1986). In general, directive questions were avoided unless they were used to clarify points or issues suggested by the participants.

2.5.3 Participant Selection and Interview Analysis

A targeted sampling strategy was used to identify initial participants for individual interviews, with additional potential participants identified through a "snowball" strategy to expand the sample in terms of individuals and knowledge areas. Persons knowledgeable about whaling activities and others informed about their community and its history were the primary criteria for targeting particular individuals to include in interviews. Community government leaders and the leadership of the AEWC and local whaling captains association were starting points for the targeted sampling strategy. Participants selected for interviews included whaling captains, whaling captains' wives and family members, crew members of diverse ages, elders, municipal mayors, leadership within village councils, Native corporations and other organizations, and other persons participating in a variety of community events, but quickly expanded outward.

Using this sampling approach, participants were invited to participate in interviews structured by the interview protocol/discussion guide. These interviews took place in homes, in government offices, during preparations for subsistence activities, and in other public settings. These interviews ranged from 2 to 4 hours in duration. Field notes were taken during the interviews (cf. Sanjek 1990; Emerson, Fretz, and Shaw 1995). These field notes became the information base for analysis and preparation of the text presented in this document. These notes were reviewed and coded using a combination of predefined and emergent codes (Boyatzis 1998; Strauss and Quinn 1997; Strauss 1987; Dey 1993). The predefined codes corresponded to the topic areas in the discussion guide. The emergent codes were based on topics volunteered by participants. The analysis identified themes in the topic and emergent codes as well as participant statements to illustrate the content of the topic areas (cf. Agar and Hobbs 1985).

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CHAPTER 3
OVERVIEW OF PROJECT COMMUNITIES

3.1 GEOGRAPHICAL AND HISTORICAL OVERVIEW

This section provides an overview of the geographical setting of the project and presents a brief history of the regions in which the project communities are located. A fully referenced, detailed discussion of the historical importance of whaling in the project communities is provided in Appendix A.

The residents of the three whaling communities (Barrow, Nuiqsut, and Kaktovik) in the NSB that are the focus of this report are primarily Iñupiat. Savoonga, the community selected as a control, is a Siberian Yup'ik whaling village on St. Lawrence Island. Savoonga was selected because it is both an active coastal whaling village with a large enough population to provide adequate samples and to be comparable to the other villages in the study, and because there has been no historic or future plans for OCS development, providing a contrast to the other three villages.

The NSB is the largest municipality in the United States, larger geographically than several of the contiguous states. The NSB is bordered by the foothills of the Brooks Range on the south, the Arctic Ocean on the north, Canada's Yukon Territory on the east, and the Chukchi Sea on the west. The NSB has a landmass of 89,000 square miles, which is approximately 15% of Alaska's landmass, all of which is located above the Arctic Circle. In 2000, the eight communities in this vast area contained a total of 7,385 residents, or about 1% of Alaska's population. In addition, North Slope oil field operations provide employment to about 5,000 non-residents, who rotate in and out of oil work sites from Anchorage, other areas of Alaska, and the lower 48 states.

Barrow is the northernmost incorporated community in North America. It is located on the Chukchi Sea coast, 10 miles south of Point Barrow from which it takes its name. Barrow is the largest community in the NSB and the regional center. Nuiqsut is located on the west bank of the Nechelik Channel of the Colville River delta, about 25 miles from the Arctic Ocean and approximately 150 miles southeast of Barrow. Kaktovik is the easternmost village in the NSB. It is located on the north shore of Barter Island, situated between the Okpilak and Jago rivers on the Beaufort Sea coast (Figure 1-2). Barter Island is one of the largest of a series of barrier islands along the north coast and is about 300 miles east of Barrow.

Savoonga and Gambell are the only two communities on St. Lawrence Island, the largest island in the Bering Sea. Including the three small Punuk Islands near its eastern edge, St. Lawrence Island covers an area about the size of New Jersey. It is located approximately 150 miles south of the Arctic Circle. The north Russian mainland is only about 38 miles away. In 2000, Savoonga and Gambell had a total population of 1,292, of which 643 lived in Savoonga. Savoonga is located on the northern coast of the island. It is about 39 miles southeast of Gambell and 164 miles west of Nome.

The history of the North Slope Iñupiat and St. Lawrence Islanders can be summarized in a number of different ways, depending on one's analytical focus and the definition of historical periods of interest. This discussion centers on four periods—pre-contact through the commercial whaling period (prehistoric to early 1900s); reindeer herding, fur trapping, and trading (late 1800s-1940s); oil exploration and the Distant Early Warning (DEW) Line System (post World War II to 1970); and the period from 1970 to the present, the period of the ANCSA and formation of the NSB.

Prior to contact with Euro-Americans, the North Slope Iñupiat and St. Lawrence Islanders were hunters and gatherers dependent upon the availability of terrestrial and marine mammals for subsistence. The pre-contact aboriginal population is unknown, but estimates range into the thousands. The aboriginal population almost certainly fluctuated according to the migration and population fluctuations of their food resources. There were few, if any, permanent settlements as the general pattern of life was one of named small groups living within relatively well-defined territories following a mobile subsistence round defined by the seasonal availability of food resources in specific locations at specific times of the year. These groups constituted a society well adapted to the extremes of the arctic environment: hunters cooperated in pursuing seasonally available sea mammals, fish, birds, and other game while women dressed game and gathered greens, berries, and other foods.

Contact with Euro-Americans intensified during the commercial whaling period, from the mid-1800s through the early 1900s. This period was one of extreme population relocation and decline for the North Slope Iñupiat and St. Lawrence Islanders. Coastal communities grew swiftly, due to the attraction of trading posts, church missions, schools, and employment opportunities created by the whaling industry. Disease, alcohol, food resource declines, and other factors increased mortality rates greatly, with the result that the interior of the North Slope was for the most part depopulated and coastal communities brought people together from many smaller groups of pre-contact times. A famine on St. Lawrence Island in 1878-1880 caused many to starve and many others to leave, decimating the island's population. The decreased size of the total Native population on the North Slope and St. Lawrence Island, and its increased concentration and "mixing," resulted in a marked geographical broadening of kinship relations.

The decline of commercial whaling in the early 1900s resulted in economic instability in the Native communities. Trapping became viable as a primary source of cash starting about 1920, but after the depression of 1929, furs lost their value and many households returned to a more subsistence-based mode of life. During this period, airstrips, schools, missions, and trading posts continued to be established. With the start of World War II, many North Slope Iñupiat and St. Lawrence Islanders served in the Alaska Territorial Guard or were recruited into the regular ranks of the U.S. military. In 1944, the U.S. Navy initiated oil exploration in the Barrow area, providing job opportunities to Iñupiat across the region. The exploration of the Naval Petroleum Reserve Number 4, which was established in 1923 and is now known as the National Petroleum Reserve–Alaska (NPRA), was responsible for significant growth in Barrow. Another major development that increased wage employment and economic growth in North Slope villages was the decision, following World War II, by the federal government and its allies to establish radar stations across the Arctic. These radar stations, known as the DEW Line System, were originally established to detect incoming aircraft and missiles from the Soviet Union during the Cold War.

The post-war years also saw the emergence of the settlement of Native land claims as a prime social, political, and economic issue among Alaska Native communities. Initial activity on land claims resulted from the Indian Claims Commission Act of 1946, which permitted the federal government to be sued by "Indian tribes" on certain kinds of claims not previously allowed. The doctrine of aboriginal dominion was the basis on which most of these claims were contested. The Alaska Statehood Act of 1958 brought the issue of Native land claims into sharper focus. The Statehood Act gave the State of Alaska the right to select more than 100 million acres of land as its own to develop. Some of the development projects proposed for Alaska threatened to disrupt the relationship of Alaska Natives to their land and traditional way of life. Native leaders pressed for a freeze on all land conveyances to the state from the federal government until Native claims had been resolved, a freeze that U.S. Interior Secretary Stewart Udall granted in 1966.

The major Prudhoe Bay oil discovery late in 1967 brought economic urgency to the need to reach an agreement on how much land and money Alaska Natives should receive in settlement of land claims. A number of large oil companies joined the ranks of those trying to gain access to land tied up in those claims. The unresolved claims covered land that the proposed trans-Alaska pipeline would cross, and the claims, as well as court suits brought by environmental organizations opposed to pipeline construction, were delaying the start of the project. Finally, state and federal leaders found a settlement acceptable to Native leaders, and Congress passed ANCSA in 1971.

Under ANCSA, all past and future claims of Native right, title use, or occupancy were extinguished except as provided by the Act. The Native peoples of Alaska gave up their rights to approximately 320 million acres of land in Alaska and in return were paid $962.4 million dollars. In addition, 44 million acres of land were retained for distribution in fee simple title as provided by ANCSA. Congress had decided that existing Native institutions such as tribal governments would not receive and manage the settlement. Instead, ANCSA created village and regional corporations to manage the lands and capital on behalf of the Alaska Natives. Land and money were channeled to North Slope villages through local village corporations and the Arctic Slope Regional Corporation (ASRC), a for-profit regional corporation formed under ANCSA. Under the terms of ANCSA, ASRC was designated to receive about 4.6 million acres and $22.5 million from which each of the region's eight village corporations was to receive a portion.

The North Slope Iñupiat also took advantage of state legislation that made it possible to form regional governments (boroughs) with a taxing authority on property. Through the persistent efforts of Iñupiaq community leaders, the NSB was incorporated as a first-class borough in 1972 (it became a home-rule borough in 1974).[3] Through its taxing authority, the NSB received large revenues from Prudhoe Bay oil production that became an important factor in developing local public services and facilities in North Slope communities. Construction of the public infrastructure and the need to maintain it and provide the services supported by it led to a substantial increase in the jobs available for the North Slope Iñupiat. The increased employment opportunities and quality-of-life improvements in the villages served to attract and retain local residents. In addition,

[3] Kruse (1984) notes that the State of Alaska, viewing Prudhoe Bay oil as a statewide tax resource, opposed formation of the NSB. In addition, the oil companies, who wanted to limit and stabilize their tax liability, fought the formation of the borough in the courts.

the migration of non-Natives to the North Slope, especially Barrow, in conjunction with these changes substantially increased the ethnic diversity and size of the population.

The St. Lawrence Island communities of Gambell and Savoonga, along with all other Alaska communities, benefited from the petroleum revenues collected by the State from the Prudhoe Bay oil field, but because Gambell and Savoonga were located outside the NSB they did not benefit as greatly as the Iñupiaq communities. Nor did they receive a large payment under ANCSA, as the St. Lawrence Islanders chose instead to take fee simple title to the surface and subsurface lands of the island.[4] However, the public sector at the federal and state levels became an important source of income.

The North Slope Iñupiat and St. Lawrence Islanders have proven themselves to be extremely able to adapt to changing conditions. Their social and cultural institutions supported the capacity to adapt to a harsh and variable physical environment. Post-contact history shows an ongoing capacity to blend new beliefs, values, foods, and technology with traditional lifestyles. The dominant cash and consumer culture of the larger United States continues to influence residents, which has resulted in significant challenges to traditional values—especially those values centered on land use and the subsistence lifestyle linked directly to it (Circumpolar Research Associates 2004). Yet, participation in this lifestyle is still perceived by the North Slope Iñupiat and St. Lawrence Islanders as a defining element of their cultural identity. The introduction of modern technology has tied the subsistence economy increasingly to a cash economy. Nevertheless, income-generating opportunities have been able to support a way of life unique to these Native peoples. What exists in the project communities is "a unique lifestyle in which a modern cash economy and traditional subsistence are interwoven and interdependent" (BLM 1979).

3.2 DEMOGRAPHIC CHARACTERISTICS

This section presents selected demographic characteristics to provide a contemporary socioeconomic representation of the communities of interest. Demographic data collected by the U.S. Census Bureau in the 2000 census are used to provide temporally consistent information across all four villages. For comparative purposes, demographic information for the entire state of Alaska is also provided.

As shown in Table 3-1, the populations of all of the project communities in 2000 were fairly small even though Barrow is the largest community in the NSB and the region's economic, transportation, and administrative center. The residents of the project communities are mostly of Alaska Native descent, but the size of the Native population differs substantially across villages,

[4] Under ANCSA, Native villages were allowed two options. One option was to become a standard village corporation and receive a share of surface land according to the number of residents in 1970. Each village corporation also received its share of the ANCSA cash settlement. A second option, which was most advantageous to villages that had large former reserves or reservations, was to take fee simple title to the reserve or reservation lands. The villages of Gambell and Savoonga elected to take title to the more than 1 million acres of surface and subsurface lands in the former St. Lawrence Island Reserve (all land is jointly owned by the village corporations of the two communities). By choosing this option Gambell and Savoonga received none of the cash settlement. However, under a special provision enacted subsequent to ANCSA, the village for-profit corporations on St. Lawrence Island each received a modest start-up payment (Jorgensen 1990).

from 57% in Barrow to 95% in Savoonga. The balance of the village populations is largely white, along with a substantial Asian presence. While Barrow is the most racially diverse of the project communities, it is far less diverse than the state as a whole.

Table 3-1. Population and Ethnicity, 2000

	Barrow	Kaktovik	Nuiqsut	Savoonga	Alaska
Population	4,581	293	433	643	626,932
	Percent of Population				
White	21.8	14.7	10.2	4.4	69.3
Alaska Native or American Indian	57.2	75.4	88.2	95.3	15.6
Black	1.0	0.0	0.2	0.0	3.5
Asian	9.4	0.3	0.5	0.2	4.0
Hawaiian Native	1.4	0.0	0.0	0.0	0.5
Other Race	0.7	0.7	0.0	0.0	1.6
Two or More Races	8.5	8.9	0.9	0.2	5.4

Source: U.S. Census Bureau 2000.

While the median age in Kaktovik was nearly the same as the state's median age, the median ages of Barrow, Savoonga, and Nuiqsut were nearly 4 to 8 years younger than the statewide median in 2000 (Table 3-2). This is especially significant considering that Alaska has one of the youngest populations of any state. The low median ages reflect the relatively high birth rates in these villages. Another manifestation of the high birth rates in most of the project communities is the size of their school-aged populations. For example, 36% of Nuiqsut's population was of school age vs. 26% statewide. Notwithstanding the high natural increases, population growth in the villages is low or negative because of out-migration of working-age persons to larger urban areas.

Table 3-2. Age and Gender, 2000

	Barrow	Kaktovik	Nuiqsut	Savoonga	Alaska
Median age	28.8	32.1	23.8	25.5	32.4
	Percent of Population				
Male	51.7	52.6	59.6	50.4	51.7
Female	48.3	47.4	40.4	49.6	48.3
Age 4 and under	9.8	8.9	9.7	7.3	7.6
Age 5 - 9	9.9	13.3	9.7	12.3	8.6
Age 10 - 14	11.1	9.6	14.5	11.4	9.0
Age 15 - 19	8.9	7.2	11.5	10.0	8.0
Age 20 - 24	5.7	3.8	6.0	8.4	6.4
Age 25 - 34	13.8	12.3	15.9	12.9	14.3
Age 35 - 44	17.8	14.7	14.5	15.7	18.2
Age 45 - 54	13.7	14.3	7.4	9.8	15.1
Age 55 - 59	3.7	5.1	3.9	3.1	4.4
Age 60 - 64	2.1	3.4	2.3	3.6	2.8
Age 65 - 74	2.1	4.8	2.8	3.7	3.6
Age 75 - 84	1.1	2.4	1.6	0.8	1.7
Age 85 and over	0.2	0.3	0.0	1.1	0.4

Source: U.S. Census Bureau 2000.

The male-female ratio of the project communities in 2000 was similar to that of the state as a whole, with the exception of Nuiqsut (Table 3-2). The high male-female ratio in Nuiqsut is likely the result of in-migration of men seeking work at nearby Alpine oil field production facilities or support businesses.

Improvements in educational facilities over the past three decades have substantially raised education levels in the project communities, but the educational attainment of residents remained below that of the statewide population in 2000 (Table 3-3). For example, 42% of Savoonga's inhabitants aged 25 years or older had less than a high school education as compared with 12% of all Alaska residents. Barrow most closely resembles the state as a whole with respect to education level.

Table 3-3. Educational Attainment, 2000

	Barrow	Kaktovik	Nuiqsut	Savoonga	Alaska
	Percent of Persons 25 Years Old and Over				
Less than 9th grade	9.8	24.7	20.6	24.1	4.1
9th to 12th grade, no diploma	8.2	11.1	16.2	18.2	7.5
High School graduate (inc. equiv.)	31.1	33.3	42.2	46.0	27.9
Some college, no degree	25.2	14.8	13.7	6.8	28.6
Associate degree	5.3	0.0	0.0	0.9	7.2
Bachelor's degree	13.6	4.9	4.9	1.1	16.1
Graduate or professional degree	6.7	11.1	2.5	2.8	8.6

Source: U.S. Census Bureau 2000.

In 1999, median household income in the North Slope villages under study approached or exceeded the Alaska median income (Table 3-4). The main reason for the high income levels is the creation of employment opportunities by the NSB, which receives substantial tax revenues from oil and gas properties. Savoonga is more typical of the majority of Alaska's rural localities, which generally have proportionally more unemployed persons because job opportunities in villages are scarce. As a result of relatively few economic opportunities and a high joblessness rate, household incomes are low and the poverty rate is high.

Table 3-4. Employment and Income, 1999

	Barrow	Kaktovik	Nuiqsut	Savoonga	Alaska
Percent of persons aged 16 years and older unemployed	12.7	15.2	8.8	37.4	6.1%
Percent of persons aged 16 years and older not working (unemployed and not seeking work)	35.3	38.4	33.3	65.4	
Median household income	$67,097	$55,625	$48,036	$23,438	$51,571
Percent of persons whose income was below the poverty level	8.6	6.6	2.4	29.1	9.4

Source: U.S. Census Bureau 2000.

Although incomes are relatively high in North Slope villages, the 1998-1999 NSB census found that an increasing proportion of North Slope jobs are short-term and/or part-time employment and there is a rising level of underemployment[5] among the resident population (Circumpolar Research Associates 1999). The most recent census, conducted in 2003, indicates that high unemployment and underemployment are still a concern on the North Slope, although the population decline in some communities has mitigated these conditions to some extent (Circumpolar Research Associates 2004).

The cost of living in all of the project communities is among the highest in the nation. For example, among 24 locations in the state, the Cooperative Extension Service of the University of Alaska Fairbanks listed Nuiqsut and Barrow as the second and fourth most expensive places for weekly food costs for a family with two school-aged children (Fried and Windisch-Cole 2005). The cost of food items was more than 2.3 times higher in Nuiqsut and 2.1 times higher in Barrow than in Anchorage. Transportation costs account for most of the price differential. Given their remoteness, it is likely that Kaktovik and Savoonga have similar high living costs.

3.3 SUBSISTENCE BOWHEAD WHALE HUNTING

This section provides a brief overview of subsistence bowhead whaling activities in the project communities. A detailed discussion of the contemporary significance of the bowhead whale hunt in these communities is provided in Appendix A. Additional information on whaling activities in each project community is presented in Chapter 4.

A critical part of the bowhead subsistence hunt in the project communities is the quota regime of the International Whaling Commission (IWC). This regime regulates how many whales are available to the communities each year and provides for international oversight of hunting activities and the environmental circumstances surrounding the hunt. Under the IWC regime, the communities are allowed to strike only a limited number of bowhead whales each year. Over the ensuing years, the IWC quota has gradually increased, due in part to information collected by an ongoing bowhead whale census off Point Barrow carried out by the NSB Department of Wildlife Management (Ahmaogak 2000).

In 1981, the National Oceanic and Atmospheric Administration (NOAA), the federal agency responsible for managing marine mammals within U.S. jurisdiction, delegated the management authority for the Eskimo whale harvest to the AEWC. The cooperative agreement between the NOAA and AEWC allows the AEWC to manage the hunt without the presence of federal agents in the whaling communities. The AEWC exists today as a tax-exempt non-profit corporation whose purpose, as stated in its current by-laws (AEWC 1998), is to:

- preserve and enhance the marine resource of the bowhead whale including the protection of its habitat

[5] Underemployment refers to a situation where workers are underutilized in terms of workers being unable to find jobs utilizing the level of skills they possess (i.e., workers taking lower skill level jobs than desired) and/or workers taking part-time jobs due to an inability to find desired full-time employment.

- protect Eskimo subsistence bowhead whaling
- protect and enhance the Eskimo culture, traditions, and activities associated with bowhead whales and subsistence bowhead whaling
- undertake research and educational activities related to bowhead whales

The members of the AEWC are the registered whaling captains and their crewmembers of the 10 whaling communities. The registered whaling captains are voting members, while the crewmembers are nonvoting members. The AEWC is directed by a board of 10 commissioners. Each member village elects one of these commissioners through its whaling captains association. This board has complete authority over all of the commission's affairs (Ahmaogak 2000).

Through general meetings of whaling captains the AEWC allocates the quota established by the IWC among the various whaling villages and also establishes the formal rules of the hunt in terms of allowable equipment and other general guidelines. Consequently, all four project communities abide by the same rules and utilize similar technologies. The AEWC requires that subsistence whalers use "traditional weapons," which are defined as follows:

> *"[T]raditional weapons" means a harpoon with line attached, darting gun, shoulder gun, lance or any other weapon approved by the AEWC as such a weapon in order to improve the efficiency of the bowhead whale harvest. "[H]arpoon with line attached" means a harpoon with a rotating head which is attached to a line and float and which has no explosive charge. … "[D]arting gun harpoon" means a harpoon with an explosive charge and with a line and float attached. … "[S]houlder gun" means a whaling gun, adapted from the era of commercial whaling in the 19th century, which has an explosive charge and which has no attached line and float. "[L]ance" means a non-explosive sharply pointed weapon without a harpoon head. "[E]xplosive charge" … means for initial strikes a penthrite-based explosive charge developed, approved, and issued to a whaling captain by the AEWC, unless such explosive charge has not been issued or is not compatible with the darting gun harpoon …* (AEWC 1995:3-4)

The AEWC administers the whale hunt and has gradually assumed a greater role than merely ensuring that the quota is not exceeded. However, in most matters related to the local hunt, the AEWC defers to the Village Whaling Captains Association established in each of the whaling communities. These associations regulate the local whale hunt and sponsor the applications of local residents to the AEWC who want to become whaling captains by forming whaling crews.

Since 1986, the AEWC has facilitated the negotiation of an Oil/Whalers Agreement (now termed a Conflict Avoidance Agreement [CAA]) between the fall subsistence whalers and the petroleum industry with planned activities that could potentially adversely affect the fall hunt. This has been most important for Nuiqsut whalers, since their whaling site at Cross Island is in such close proximity to ongoing petroleum activities. However, both Barrow and Kaktovik have regularly participated because of the potential effects of exploration activities (seismic and drilling during the open water season). During the 2006 season the Chukchi Sea communities were also

included because of the scope of planned industry activities. The CAA has provided logistical support to the whaling activities of some communities, particularly Nuiqsut. Perhaps of more importance, however, are the communication provisions in the CAA to minimize the extent to which exploratory industry activities disrupt whaling.

Table 3-5 shows the number of bowhead whales harvested by the project communities and the total number taken by Alaska Natives between 1978 and 2005. Figure 3-1 provides a graphic representation of the whale harvest during this time and allows the reader to view the movement and change in bowhead landings.

No other marine mammal is harvested by residents of the NSB project communities with the intensity and concentration of effort that is expended on the bowhead whale. Bowheads are very important in the subsistence economy; they are an important meat resource and the source for maktak, an especially preferred food. The sharing of the bowhead is a central aspect of Thanksgiving and Christmas feasts and the focus of the whale feast, Nalukataq.[6] The bowhead is shared extensively with other North Slope residents and often with Iñupiaq residents in communities as far away as Fairbanks and Anchorage. Its baleen is bartered in traditional networks and is used in the manufacture of traditional arts and crafts.

The following excerpt from MMS (2002:VI-53-54) underscores the sociocultural significance of the bowhead whale hunt to the NSB project communities:

> *The subsistence pursuit of bowhead whales has major importance to the communities of Barrow, Nuiqsut, and Kaktovik and continues today to be the most valued activity in the subsistence economy of these communities. This is true even in light of harvest constraints imposed by quotas of the International Whaling Commission; relatively plentiful supplies of other resources such as caribou, fish, and other subsistence foods; and supplies of retail grocery foods. Whaling traditions include kinship-based crews, use of skin boats (only in Barrow for their spring whale-hunting season), distribution of the meat, and total community participation and sharing. In spite of the rising cash income, these traditions remain as central values and activities for all Iñupiat on the North Slope. Bowhead whale hunting strengthens family and community ties and the sense of a common Iñupiaq heritage, culture, and way of life. In this way, whale-hunting activities provide strength, purpose, and unity in the face of rapid change.*

While the dietary and sociocultural importance of the subsistence bowhead whale hunt is comparable across all the North Slope project communities, the communities differ with respect to when the hunt occurs and the hunting methods employed. These differences are discussed in Chapter 4.

[6] As with many other Iñupiaq words with various spellings in English, we have chosen a single common spelling to use in this report.

Table 3-5. Number of Bowhead Whales Quota[a]/Harvested[b]

[transfers from prior years are included in parentheses as (+~)]

Year	IWC Quota for whaling villages in Alaska	Barrow		Kaktovik		Nuiqsut[c]		Savoonga		Total landed Alaska[f]
		Quota	Landed[d]	Quota	Landed[d]	Quota	Landed	Quota	Landed[e]	
1973	N/A	N/A	17	N/A	3	N/A	1	N/A	4	39
1974	N/A	N/A	9	N/A	2	N/A	0	N/A	0	20
1975	N/A	N/A	10	N/A	0	N/A	0	N/A	0	15
1976	N/A	N/A	23	N/A	2	N/A	0	N/A	7	48
1977	N/A	N/A	20	N/A	2	N/A	0	N/A	0	29
1978[g]	14 landed or 20 struck	3 landed or 3 struck	4[h]	1 landed or 2 struck	2	1 landed or 2 struck	0	1 landed or 2 struck	1	12
1979[i]	18 landed or 27 struck	5 landed or 7 struck	3	2 landed or 3 struck	5	1 landed or 3 struck	0	2 landed or 3 struck	0	12
1980[j]	18 landed or 26 struck	5 landed or 7 struck	9	2 landed or 3 struck	1	1 landed or 1 struck	0	2 landed or 3 struck	2	16
1981[k]	17 landed or 27 struck	9	4	3	3[l]	1[m]	0	3	2	17
1982[n]	17 landed or 27 struck	5	0	2	1	1	1	2	1	8
1983	17 landed or 27 struck	4	2	2	1	1	0	2	1	9
1984[o]	27 struck	8	4	3	1	1	0	3	2	12
1985	27 struck	4	5	2	0	1	0	2	1	11
1986[p]	32 struck	9	8	3	3	2	1	3	0	20
1987	32 struck	9	7	3	0	2	1	3	1	22
1988[q]	35 struck	11	11	2	1	2	0	4	0	23
1989[r]	41 landed or 44 struck	15	10	2 (+1)	3	2	2	4	1	18
1990[s]	41 landed or 47 struck	15	11	2	2	2	0	4	5	30
1991[t]	41 landed or 44 struck	15	12	2	1	2	1	4	0	27
1992[u]	41 landed or 54 struck	18	22	3	3	3	2	5	4	38
1993[u]	41 landed or 54 struck	18 (+5)	23	3	3	3	3	5	1	41
1994[u]	41 landed or 52 stuck	18	16	3	3	3	0	5	2	34
1995[v]	68 struck	22 (+2)	19	3 (+1)	4	4	4	6	4	40
1996	77 struck	22	24	3	1	4	2	6	2	39
1997	76 struck	22 (+8)	30	3 (+1)	4	4	3	6	1	47
1998[w]	77 struck	22	16[x]	3	3[x]	4	4	6	3	41
1999[y]	75 struck	22	24	3	3	4	3	6	3	42
2000[z]	75 struck	22	18	3	3	4	4	6	1	35
2001[aa]	75struck	22	27	3	4	4	3	6	3	49
2002[bb]	75 struck	22	22	3	3	4	4	6	5	37
2003[cc]	75 struck	22	16	3	3	4	4	8	3	35
2004[dd]	75 struck	22	21	3	3	4	3	8	0	36
2005[ee]	75 struck	22	29	3	3	4	1	8	7	55

[a] The IWC determines the quotas on an annual basis and the AEWC determines and manages the distribution among villages. Whaling must cease whenever a number of whales landed or the number of strikes made reaches the specified number, whichever comes first. From 1978 through 1983 and from 1989 through 1994, the quota included an either/or option for whales struck or landed. In other years, the quota was for strikes only.

Quota data sources: AEWC communication and reports. Alaska Eskimo Whaling Commission Quota Distribution; Bowhead Whales: IWC Quota and Population Estimates, 1978-1998 and R.S. Suydam et al. 1995. Revised data on the subsistence harvest of bowhead whales (*Balaena mysticetus*) by Alaska Eskimos, 1973-1993. Forty-fifth report of the International Whaling Commission 45:335-338, data included in Marine Mammal Commission Annual Report to Congress 2000. March 31, 2001; page 151.

[b] Harvest is defined by the AEWC Management Plan as "to kill and bring to shore or butchering area." Harvest figures do not include bowheads struck and lost. AEWC Management Plan.

Source of 1978-1982 Barrow and Kaktovik harvest data: Tables 7 and 8; Subsistence In Alaska: Arctic, Interior, Southcentral, Southwest, And Western Regional Summaries. Schroeder, Andersen et al. Technical Paper No. 150. Alaska Department of Fish and Game Division of Subsistence. Juneau. September 1987. Source of 1978-1982 village quota data: Marquette, W.M. 2002. Annotated bibliography of the bowhead whale, *Balaena mysticetus*, 1767-1983. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-127, p. 326. Source of Nuiqsut data (landings and quota) 1982-2003: Galginaitis, Michael. 2005. Annual Assessment of Subsistence Bowhead whaling near Cross Island, 2003 ANIMIDA Task 4 Annual Report. Contract Number 1435-01-99-CT-30998, TO 10904. Prepared for U.S. Department of the Interior Minerals Management Service, Alaska OCS Region.

2004 data for Kaktovik, Barrow, and Nuiqsut: Suydam, R.S., J.C. George, C. Hanns, and G. Sheffield. Subsistence harvest of bowhead whales (*Balaena mysticetus*) by Alaskan Eskimos during 2004.

Source of 1999 Kaktovik data is from the AEWC Data Strikes worksheet. Barrow landings (24 total) are greater than quota allocation (22) due to prior year transfers.

[c] In the case of Nuiqsut, whales listed are landed, no "struck and lost" are listed. After 1973, few crews whaled from Nuiqsut, though they regularly went to other communities in the spring to participate in spring whaling. Though crews did whale from 1973 to 1982 at various locations, the first whale taken in Nuiqsut during this period was in 1982. Nuiqsut whalers have attributed their lack of success in the 1970s and 1980s to interference from oil and gas exploration, as well as poor weather and ice conditions. After Cross Island was established as the center for Nuiqsut whaling, harvest success became much more regular. Source: Galginaitis, Michael. 2003 Annual Report; ANIMIDA Task Order 004.

[d] Source: AEWC Village by Village Factsheets for 1981-1987 and AEWC Balance Sheets for 1988-1997. Source of data for 1973-1980 is Schroeder, Andersen et al. Subsistence In Alaska: Arctic, Interior, Southcentral, Southwest, And Western Regional Summaries. Technical Paper No. 150. Alaska Department of Fish and Game Division of Subsistence. Juneau. September 1987; Tables 7 and 8. Schroeder, Andersen et al. do not specify that the harvest data is whales landed.

[e] Source: Savoonga Landed Whales Historical Records spreadsheets from the Savoonga Whaling Captains Association. AEWC Balance Sheets show slight discrepancy, recording 3 landed in 1996 instead of 2 and 0 landed in 1997 instead of 1.

[f] "Total Landed Alaska" includes 10 whaling villages as follows: Little Diomede, Savoonga, Gambell, Wales, Kiuqlina, Pt. Hope, Wainwright, Barrow, Nuiqsut, and Kaktovik. 1973-2002 data source: Marine Mammal Commission Annual Report to Congress 2000. March 31, 2001; Table 12, page 151, with the exception of the years 1991 and 1997, which were inconsistent with information provided directly by the AEWC. For 1991, AEWC Balance Sheet reported 27 while Marine Mammal Commission (MMC) annual report listed 28. For 1997, the AEWC Balance Sheet reports 47 while the MMC annual report lists 48. This difference in 1997 could be due to the AEWC reporting of 0 landed whales for Savoonga for that year while Savoonga Landed Whales Historical Records report 1.

[g] 1978 was the first year of the IWC bowhead whaling quota system. Federal whaling regulations published. Arctic Coastal Zone Management Newsletter. 1978a 10:11-12.

[h] The 1978 harvest for Barrow has been disputed, as U.S. government accused the hunters of exceeding their 3-whale quota; while the hunters argued that 2 of the 4 whales taken were Right whales, which are not subject to the quota. This was resolved between the parties as an unintentional violation with no prosecution. Source: 1978. Iñupiat take bowheads under quota; three villages take limit. Barrow over by one. Tundra Times, May 10, 15(19): 1, 6, 12. According to Schroeder, Andersen et al. Subsistence In Alaska: Arctic, Interior, Southcentral, Southwest, And Western Regional Summaries. Technical Paper No. 150. Alaska Department of Fish and Game Division of Subsistence. Juneau. September 1987, the Barrow harvest is 3.

[i] 1979. From Ketchikan to Barrow: Bowhead quotas for Alaska's whaling villages. Alaska Magazine 45 (4): 36

[j] 1980. From Ketchikan to Barrow: Disagreement over the appropriate Eskimo take of bowhead whales. Alaska Magazine 46(4):5; excerpt from the Anchorage Times.

[k] The quota for 1981-1983 was 45 landed or 65 strikes total, not to exceed 17 per year. Total and village quotas found in AEWC 1988 Worksheet for IWC Quotas, 31st Report of the IWC 1981 p. 18; and Whalers, U.S. Reach Agreement. Tundra Times, April 1, 1981; 18(13):1.

[l] Schroeder, Andersen, et al. state the Kaktovik harvest for 1982 as 0 as opposed to 1 landed according to AEWC Village by Village Factsheet.

[m] Quota for Nuiqsut 1981 was unused due to total limit.

[n] Whalers, U.S. reach quota accord. Tundra Times, March 3, 1982a. 19(9):1, 16.

[o] Quota for 1984 and 1985 was a total of 45 strikes not to exceed 27 per year. 34th REPORT of the IWC 1984, p. 23. The AEWC brochure identifies the quota as 43 strikes for the 2 years.

[p] Quota for 1986-1987 was 32 strike limit each year for 2 years. 36th REPORT of the IWC, 1986, p. 18.

[q] 1988 Quota/Harvest data from AEWC Balance Sheets, unpublished data. Quota for 1988 is found in the 37th REPORT of the IWC, 1987, AEWC Strike Sheet and Resolution 88-07.

[r] Marine Mammal Commission Annual Report to Congress 2000. March 31, 2001; Table 12, page 151. AEWC, Bowhead Whale: IWC Quota and Population Estimates, 1978-1998 identifies the quota as "44 strikes/41 landed per year, carry-over of 3 per year."

[s] AEWC Resolution No. 90-04 Allocation of the 1990 Bowhead Whale Quota from the Resolution Committee. International Whaling Commission 2006 IWC/58/WKM&AWI 22. Report 58th meeting of the. "Weapons, Techniques, and Observations in the Alaska Bowhead Whale Subsistence Hunt." Prepared by the AEWC for the 58th Meeting of the International Whaling Commission St. Kitts, June 2006.

[t] 1991 Quota: Resolution 91-03 AEWC, Alaska Eskimo Whaling Captains Association Annual Convention, AEWC Balance Sheets. For Nuiqsut, the quota stated in the table as 2 based on Resolution 91-03 AEWC differs from that in Galginaitis, Michael. 2005. Annual Assessment of Subsistence Bowhead whaling near Cross Island, 2003 ANIMIDA Task 4 Annual Report. Galginaitis reports 3 as the 1991 Nuiqsut quota. Remaining Nuiqsut data in Galginaitis is consistent with AEWC sources.

[u] 1992-1994 Quota: Resolution 92-08 Alaska Eskimo Whaling Commission, Alaska Eskimo Whaling Captains Association Annual Convention, AEWC Balance Sheets. Federal Register, March 14, 1994. The 1992-1994 quota identified 141 strikes total with no more than 54 strikes and 41 landings per year. However, strikes and landings during 1992 and 1993 affected the 1994 catch limit slightly, reducing the landings and strikes to 52 strikes or 41 landings.

Village landed source for 1992, Attachment #1 to the North Slope Borough Department of Wildlife Management October 6, 1993 Memorandum: Changes to 1992 Bowhead Harvest Statistics.

[v] Quotas for 1995-1998: Federal Register, May 18, 1995. Vol. 60, No. 96. Quotas were set for 1995-1998 so that the number of bowhead whales struck would not exceed 68 in 1995, 67 in 1996, 66 in 1997, and 65 in 1998. Any unused portion of the strike quota for each year shall be carried forward from that year and can be added to the strike quota of subsequent years (up to 10 strikes per year). Because of unused strikes in previous years, the quota was 77 in 1996 and 76 in 1997, as listed in Table 12 of Marine Mammal Commission Annual Report to Congress 2000. "AK total landed" data from Fall Bowhead Harvest Report, December 31, 1995 submitted by the AEWC in compliance with NOAA/AEWC Cooperative Agreement; and Spring Bowhead Harvest Report, July 31, 1995, submitted by the AEWC in compliance with NOAA/AEWC Cooperative Agreement.

Village data source for 1995-1997, AEWC Balance Sheets.

[w] Federal Register, April 6, 1998; Vol. 63, No 65 Rules and Regulations. Quotas for 1998-2002 were set in a 5-year block of 280 bowhead whales landed. For each of the years, the number of whales struck could not exceed 67, with the exception that any unused portion of a strike quota may be carried forward. Because in 1997 there were 15 unused strikes available for carry-over, the combined strike quota for 1992 is 82; however, this was reduced to give the Chukotka people 5 strikes, so the actual 1998 quota is 77 strikes. Quotas for 1998-2000 are subject to a U.S.-Russian agreement that allows U.S. Natives to be allocated no more than 75 strikes and Russian Natives allocated no more than 7 strikes.

Village quota source for 1998-2002, 1998 Alaska Eskimo Whaling Captains Convention Resolution No. 98-02.

[x] MMS Technical Report. Current and Projected Best Uses of the Beaufort Sea Area, BSA 1999 Final Findings, Chapter 4. p. 11. http://204.126.119.8/oil/products/publications/beaufortsea/bsa1999_final_finding/chap4.pdf

[y] Federal Register, May 26, 1999; Vol. 64, No 101. Rules and Regulations. Quota for 1999 was determined by the "not-to-exceed" annual quota of 67 strikes plus 15 unused strikes from the 1995-1997 quota. At the end of the 1998 harvest, there were 15 unused strikes remaining, providing 82 strikes available—7 provided to the Russian natives; a final total of 75 divided among the Alaska Native villages. Barrow landings include rollover from previous year to total 24.

[z] Quotas from Federal Register, August 14, 2000; Vol. 65. No. 157. Rules and Regulations. Quota for the year 2000 is similar to the 1999 year. Landing data: Final Report, 2000 Fall and Spring Bowhead Harvest Report, February 21, 2001. AEWC.

[aa] Federal Register, Vol. 66, No. 201. October 17, 2001. Rules and Regulations. 2001 quota is 75 bowhead whale strikes per year, similar to the prior years. Landing data: 2001 Fall Bowhead Harvest Final Report, December 13, 2001 and revised 04/15/02 by T. Judkins; AEWC; 2001 Spring Bowhead Harvest Final Report, December 13, 2001 and Revised 2/20/02 by T. Judkins; AEWC.

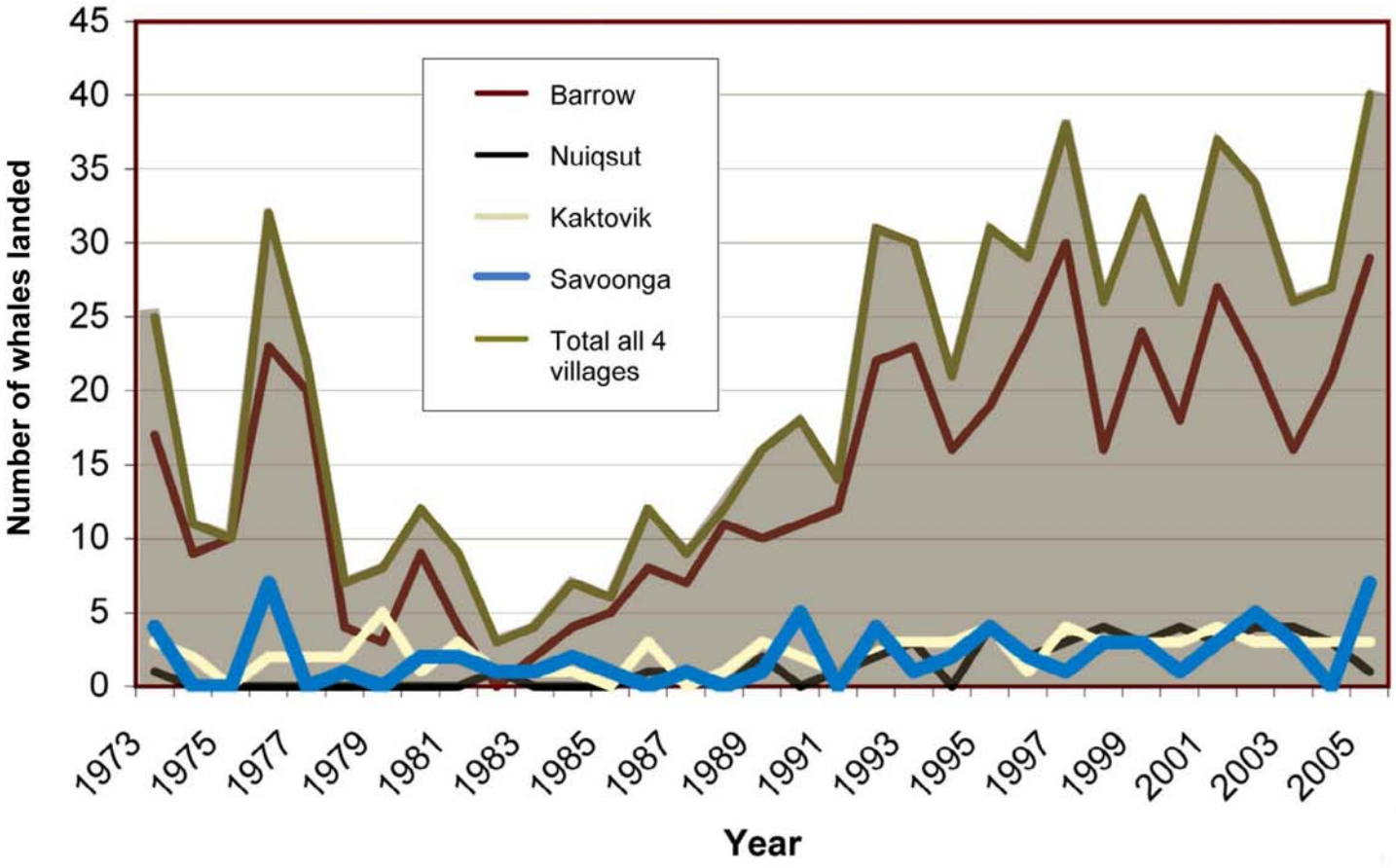
[bb] Federal Register, Vol. 67, No. 79. April 24, 2002. Rules and Regulations. For 2002, the quota remains 75 bowhead whale strikes. Landing data: 2002 Fall Bowhead Harvest Final Report, November 4, 2002 and revised May 12, 2003 by T. Judkins; AEWC; 2002 Spring Bowhead Harvest Final Report, September 15, 2002 and revised May 12, 2003 by T. Judkins; AEWC.

[cc] Federal Register, vol. 68, No. 62. April 1, 2003. Rules and Regulations. For 2003, the quota remains 75 bowhead whale strikes. 2003 village quotas obtained from AEWC 5th Mini-Convention Resolution No. 2003-01, adopted 2/14/03. Harvest/landing data obtained from the 2003 Spring/Fall Bowhead Harvest Report submitted by the AEWC in compliance with NOAA/AEWC Cooperative Agreement. Total landing data obtained IWC/58/WKM&AWI 22. report, 58th meeting of the International Whaling Commission. "Weapons, Techniques, and Observations in the Alaska Bowhead Whale Subsistence Hunt. June 2006" prepared by AEWC.

[dd] 2004 village quotas obtained from AEWC 5th Mini-Convention Resolution No. 2003-01, adopted 2/14/03. Federal Register, Vol. 69, No. 34. February 20, 2004. Notices. For 2004, the quota remains at 75 bowhead whale strikes. Village landed data source: Suydam, R.S., George, J.C., O'Hara, T.M., Hanns, C. and Sheffield, G. Subsistence harvest of bowhead whales (*Balaena mysticetus*) by Alaskan Eskimos during 2004.

[ee] 2005 village quotas obtained from AEWC 5th Mini-Convention Resolution No. 2003-01 adopted 2/14/03. Suydam 2005. Subsistence harvest of bowhead whales by Alaskan Eskimos during 2005.

Figure 3-1. Whales Landed in All Villages, 1973-2005



The following passage from Jolles (2002:286-287) suggests that the contemporary sociocultural significance of bowhead whale hunting to the St. Lawrence Island communities of Gambell and Savoonga is similar to that of the NSB project communities:

> *St. Lawrence Island identity and values derive from its long history as a hunting community. Nowhere is that sense of identity and purpose as evident as in the experience and tradition of sea mammal hunting, especially whaling. All life in the community rests, in a sense, on the organization of community members into whaling cooperatives based on patrilineal and patrilateral ties …*

Gambell and Savoonga are the southernmost subsistence whaling communities in Alaska and have access to bowheads as they pass St. Lawrence Island every spring on their way north to the Beaufort and Chukchi seas. The whales return southward through the Bering Strait, primarily between October and November, and fall migrants are occasionally hunted as late as December.

Historically, the whalers of St. Lawrence Island chased bowhead whales in lightweight, wood-framed sailboats covered in split female walrus hides. Many captains still sail to the whaling grounds in skin boats but carry outboard motors to help them return. Others have begun using outboard-powered aluminum skiffs.

Savoonga had no whaling crews until 1973, but whaling was conducted with Gambell crews prior to that time (Ellanna 1983b). The initiation of Savoonga whaling crews was associated with the use of snow machines for hauling the large skin boats overland to Southeast Cape, a distance of more than 30 miles, to the southwestern shores of St. Lawrence Island. Whaling and early season walrus hunting were not possible along the northcentral and northeast shores due to ice conditions and the migratory paths of bowhead whales and walrus.

Intercommunity cooperation in production and distribution has persisted through time although in a somewhat different form. Savoonga and Gambell whaling crews occasionally cooperate in harvesting a bowhead whale if hunting in the same area. In all cases, a bowhead harvested by one St. Lawrence community will be distributed to residents of the other community (Ellanna 1983b).

3.4 OVERVIEW OF OIL AND GAS EXPLORATION AND DEVELOPMENT ON THE NORTH SLOPE

This discussion of oil and gas exploration and development on the North Slope draws mainly on the National Research Council's 2003 report entitled, *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope*. Material from this report was updated with information from the MMS Alaska OCS Region.

Highlights of the North Slope's oil and gas exploration and development history are summarized in Table 3-6.

Table 3-6. Timeline of Oil Exploration and Development on the North Slope

Recorded history	Visible oil seepages used by Native inhabitants of the North Slope
1882	U.S. government representatives hear of oil seepages while traveling in the area.
1886	First non-Natives see seepages at Cape Simpson.
1909	First description of Cape Simpson deposits published.
1914	First oil-related claim staked.
1921	Additional claims staked by individuals and industry.
1922	First industry-sponsored geological investigation of North Slope oil potential.
1923	Naval Petroleum Reserve No. 4 (PET-4) established.
1923-1926	First analysis of PET-4 potential.
1943	Territory of Alaska Bureau of Mines sends field party to the North Slope to investigate oil and gas seepages.
1944	Start of PET-4 petroleum exploration program. PET-4 headquarters established at Barrow. Land north of the drainage divide of the Brooks Range withdrawn from public entry by the Secretary of the Interior, Public Land Order 82.
1945-1952	Numerous geophysical studies conducted across PET-4 find oil and gas.
1947	Office of Naval Research establishes Arctic Research Laboratory.
1953	PET-4 unexpectedly recessed.
1953-1968	Federal geologic field studies continue in PET-4; several major oil companies begin exploration.
1958	Public Land Order 82 modified; federal leasing begins on the North Slope; first industry-sponsored geological field programs.
1962	First industry-sponsored seismic program.
1963-1967	First industry exploration well drilled on the North Slope; 11 unsuccessful wells drilled; industry interest in the North Slope wanes.
1964	First State of Alaska lease sale on the North Slope.
1965	Area that eventually includes Prudhoe Bay leased.
1967	Initial exploratory drilling at site that would become Prudhoe Bay field.
1968	ARCO announces the discovery of Prudhoe Bay oil field, the largest in North America.
1969	Kuparuk, West Sak, and Milne Point fields discovered; lease sales suspended on the North Slope for the next 10 years because Secretary of the Interior imposes freezes due to Native claims.
1974-1976	Federally sponsored exploration along the Barrow Arch.
1976	PET-4 is transferred from the Navy to the Department of the Interior and renamed the National Petroleum Reserve in Alaska; sale of crude oil from Petroleum Reserves 1, 2, and 3 authorized.
1977	Trans-Alaska Pipeline system operational.
1979	Initial leasing of portions of state and federal OCS waters of the Beaufort Sea.
1981	First OCS exploration well drilled.
1982	Initial leasing of portions of the National Petroleum Reserve-Alaska.
1984-1985	Seismic exploration of the Arctic National Wildlife Refuge coastal plain (1002 area) conducted.
1985	First industry exploration well drilled in the National Petroleum Reserve-Alaska.
1986	Arctic Slope Regional Corporation well drilled within the 1002 area of the Arctic National Wildlife Refuge.

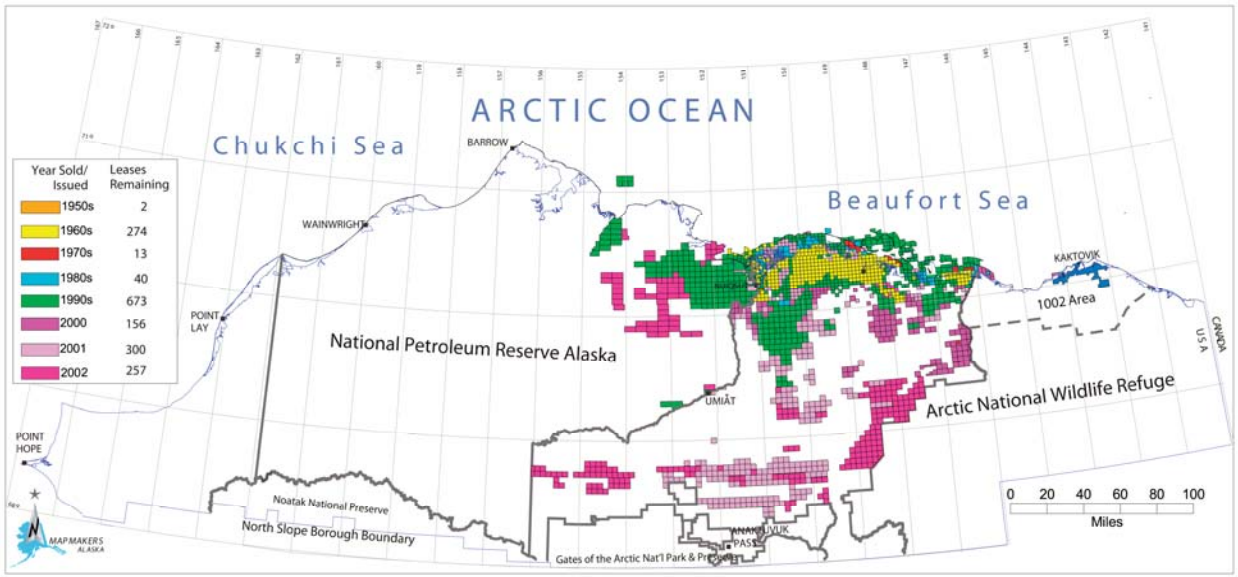
Recorded history	Visible oil seepages used by Native inhabitants of the North Slope
Various times	Initial leasing of portions of Arctic Slope Regional Corporation lands.
Early 1990s	Last of the National Petroleum Reserve-Alaska leases from the initial leasing program are relinquished.
1994	Discovery of Alpine oil field underlying the Colville River delta.
2000	Alpine oil field begins production.
2001	Northstar field begins production. Development of Liberty field suspended.

Source: National Research Council 2003.

Federal oil and gas leases are awarded through a competitive bidding process administered by the Department of the Interior. Firms compete on the basis of their bonus bid, which is an amount paid up front for the lease, regardless of whether the property ever produces any oil or gas. Bonus bids are based on the estimated value of the asset, which, in this case, is the opportunity to earn a return on capital invested in an oil and gas property over a 30- to 40-year period. The amount offered as a bonus will depend on the expected profitability of the project.

Figure 3-2 depicts active leases through 2002 and indicates where industry interest has been concentrated (leasing has covered additional areas not mapped). During the 1990s, interest expanded from the Prudhoe Bay area to the west into the NPRA and offshore. More recently, leasing has moved south into the foothills of the Brooks Range and in the Point Thomson area.

Figure 3-2. Leased Lands on the North Slope through 2002[a]



[a] The leases acquired during the 1900s are shown by decade and those since 2000 are depicted by year. The age of the leases indicates the recent shift in exploration interest to the south and west. Earlier leases that have been relinquished are not shown.

Source: National Research Council 2003.

3.4.1 Federal OCS, Beaufort Sea

The Beaufort OCS lands were unavailable to the petroleum industry until the joint state/federal lease sale of 1979. This and subsequent sales provided access to waters beyond the 3-mile limit, stretching from Point Barrow in the west to the Canadian border in the east. Beginning in 1979, the Beaufort OCS has been the site of nine lease sales (Table 3-7). The total acreage offered was 73,670,943 acres.

Table 3-7. Beaufort Sea Lease Sales

Sale	Date	Leases Issued	Blocks Offered	Acres Offered	Acres Leased	Sum of All Bids Received $[a]	Sum of High Bids $
BF	Dec-79	24	46	173,423	85,776	491,728,138	488,691,138
71	Oct-82	121	338	1,825,770	662,860	2,067,604,786	2,055,632,336
87	Aug-84	227	1,419	7,773,447	1,207,714	871,131,327	866,860,327
97	Mar-88	202	3,344	18,277,806	1,110,764	115,261,636	115,261,636
124	Jun-91	57	3,417	18,556,976	277,004	16,807,025	16,807,025
144	Sep-96	29	1,364	7,282,795	100,025	14,572,057	14,429,363
170	Aug-98	28	203	920,983	86,371	6,239,015	5,327,093
186	Sep-03	34	1,806	9,459,743	181,810	10,175,949	8,903,538
195	Mar-05	117	1,770	9,400,000	607,285	46,735,081	46,735,081
Total		839	13,707	73,670,943	4,319,609	3,640,255,014	3,618,647,537

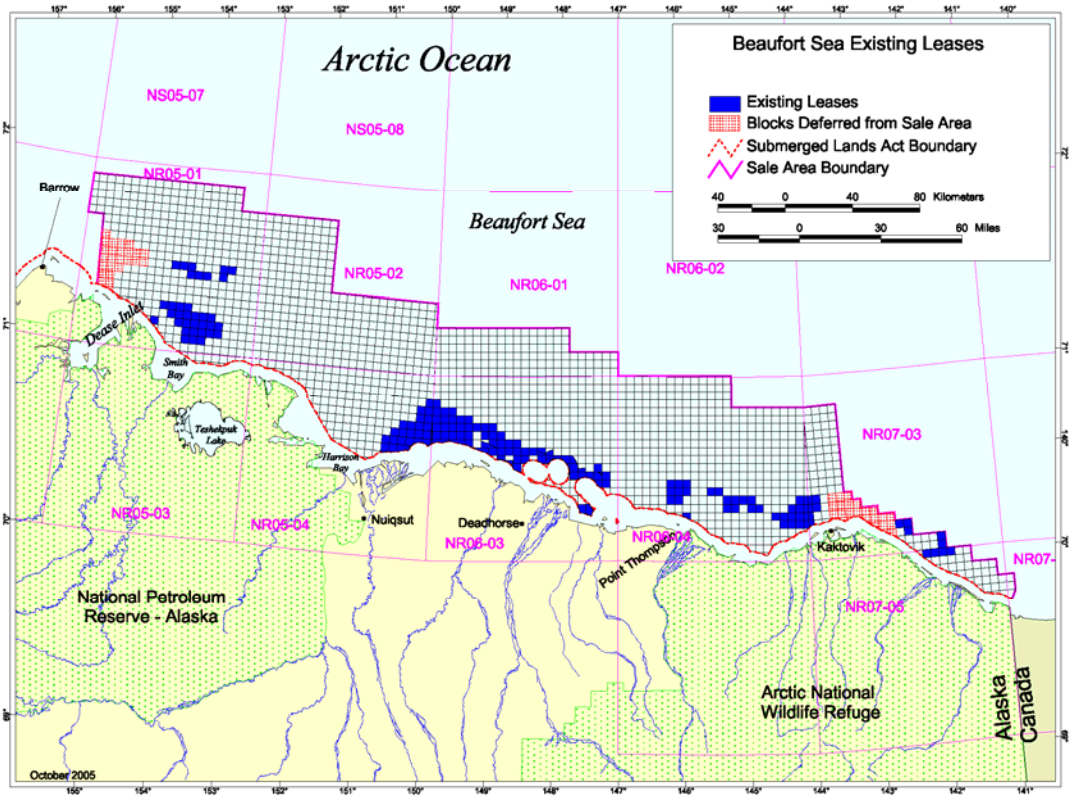
[a] Includes only accepted and rejected high bid amounts.
Source: MMS 2003a.

The locations of current Beaufort Sea leases are shown in Figure 3-3. Most of these leases are clustered around the discoveries or are associated with newly defined prospects acquired in the most recent sales.

The MMS lists 30 exploration wells drilled within the OCS (Table 3-8). The first OCS exploration well was the Beechey point No. 1, spud in 1981 (the spud refers to the date drilling began), and the most recent exploration well was the Warthog No. 1, spud in 1997. The peak of exploration drilling was in 1985-1986 when 11 of the 30 exploration wells were drilled. A secondary drilling mode occurred in 1991-1993 when seven wells were drilled. Since 1993, only three exploration wells have been drilled.

Depending on water depth, the OCS exploration wells are either drilled from man-made islands or large, heavy, bottom-anchored, ice-resistant drilling rigs. If a discovery is made and the field developed, a more permanent structure is built to provide the base for such long-term operations. Among areas with recognized development potential, water depths range from as little as 21 feet at Liberty to as much as 110 feet at Kuvlum. These depth variations dictate both the type of basic exploration drilling structure to be used and the type of production platform to be built. The costs escalate significantly with incremental increases in water depth.

Figure 3-3. Location of Current Beaufort Sea Lease Sales



Source: MMS, Alaska OCS Region website, http://www.mms.gov/alaska/cproject/beaufortsale/Sale202/current_leases_oct_2005.pdf.

Table 3-8. Beaufort Sea Exploration Wells

Operator	Prospect	Sale Number	Latitude	Longitude	Spud	End	Water Depth
Shell Oil Company	Seal	BF	70 29' 31.77"N	148 41' 34.68"W	2/22/1985	7/21/1985	39 ft
Shell Western E&P Inc.	Seal	BF	70 29' 31.44"N	148 41' 35.80"W	2/4/1984	6/30/1984	39 ft
Exxon Corporation	Beechey Point	BF	70 23' 11.79"N	147 53' 27.98"W	11/1/1981	3/31/1982	18 ft
Exxon Corporation	Beechey Point	BF	70 23' 11.79"N	147 53' 28.71"W	12/27/1981	3/15/1982	18 ft
Shell Oil Company	Tern	BF	70 16' 46.02"N	147 29' 45.61"W	5/28/1982	9/18/1982	21 ft
Shell Oil Company	Tern	BF	70 16' 46.33"N	147 29' 44.90"W	10/16/1982	3/3/1983	21 ft
Shell Western E&P Inc.	Tern	BF	70 16' 46.33"N	147 29' 44.89"W	2/10/1987	5/10/1987	22 ft
Arco Alaska, Inc.	Fireweed	71	71 05' 16.723"N	152 36' 11.479"W	10/19/1990	12/25/1990	50 ft

Operator	Prospect	Sale Number	Latitude	Longitude	Spud	End	Water Depth
Exxon Corporation	Antares	71	71 02' 10.05"N	152 43' 25.28"W	11/1/1984	1/18/1985	49 ft
Exxon Company USA	Antares	71	71 02' 10.00"N	152 43' 25.46"W	1/19/1985	4/12/1985	49 ft
Amoco	Mars	71	70 50' 34.83"N	152 04' 17.98"W	3/12/1986	4/27/1986	25 ft
SOHIO Alaska Petroleum	Mukluk	71	70 41' 00.04"N	150 55' 11.89"W	11/1/1983	1/24/1984	48 ft
Tenneco	Phoenix	71	70 43' 01.99"N	150 25' 40.15"W	9/23/1986	12/19/1986	60 ft
Shell Oil Company	Harvard	71	70 35' 05.4"N	149 05' 48.8"W	9/2/1985	1/25/1986	49 ft
Amoco	Sandpiper (Harvard)	71	70 35' 05.45"N	149 05' 48.40"W	2/8/1986	7/12/1986	49 ft
Arco Alaska, Inc.	Cabot	87	71 19' 25.44"N	155 12' 56.48"W	11/1/1991	2/26/1992	55 ft
Exxon Company USA	Orion	87	70 57' 22.3"N	152 03' 46.6"W	11/10/1985	12/15/1985	50 ft
Union Oil Company	Hammerhead	87	70 21' 52.6"N	146 01' 27.9"W	8/10/1985	9/24/1985	103 ft
Union Oil Company	Hammerhead	87	70 22' 41.79"N	146 01' 52.41"W	9/27/1986	10/11/1986	107 ft
Arco Alaska, Inc.	Kuvlum	87	70 18' 36"N	145 32' 18.2"W	7/28/1993	8/30/1993	96 ft
Arco Alaska, Inc.	Kuvlum	87	70 18' 57.38"N	145 25' 10.97"W	8/22/1992	10/14/1992	110 ft
Arco Alaska, Inc.	Kuvlum	87	70 19' 36.78"N	145 24' 14.67"W	9/7/1993	10/5/1993	107 ft
Shell Western E&P Inc.	Corona	87	70 18' 52.6"N	144 45' 32.9"W	7/28/1986	9/18/1986	116 ft
Amoco Production Company	Belcher	87	70 16' 31.16"N	141 30' 46.49"W	9/5/1988	8/29/1989	167 ft
Tenneco	Aurora	87	70 06' 33.02"N	142 47' 05.88"W	11/2/1987	8/30/1988	66 ft
Amoco Production	Galahad	97	70 33' 38.68"N	144 57' 35.75"W	9/14/1991	10/13/1991	166 ft
Encana Oil & Gas (USA) Inc.	McCovey	124	70 31' 37.9"N	148 10' 48.2"W (NAD83)	12/6/2002	1/27/2003	35 ft
Arco Alaska, Inc.	Wild Weasel	124	70 13' 22.41"N	145 29' 57.11"W	10/13/1993	11/9/1993	87 ft
BP Exploration (Alaska)	Liberty	144	70 16' 45.113"N	147 29' 47.145"W	2/7/1997	3/30/1997	21 ft
Arco Alaska, Inc.	Warthog	144	70 02' 34"N	144 55' 02"W (NAD83)	11/1/1997	12/5/1997	35 ft

Source: MMS, Alaska OCS Region website, http://www.mms.gov/alaska/fo/wellhistory/BS_WELLS.htm.

Eleven of the OCS exploration wells have been determined to be capable of production. Of these, five have been termed significant discoveries. Four of these are in federal waters and are the Kuvlum, Hammerhead, Sandpiper, and Tern/Liberty. The fifth discovery is the Northstar field (Seal well), which underlies both federal and state acreage. Three of these discoveries, Tern/Liberty, Sandpiper, and Northstar, lie offshore from the well-established Kuparuk and Prudhoe Bay fields and their infrastructure. The Hammerhead and Kuvlum discoveries are well to the east of the Prudhoe Bay field in relatively deep water. Hammerhead is offshore from the Point Thomson and Flaxman discoveries. The Kuvlum discovery is to the east of the Canning River and offshore from the coastal plain (1002 area) of the Arctic National Wildlife Refuge.

The Northstar field has been developed and began production in late 2001, becoming the first (and, to date, the only) site producing OCS oil in Alaska's Beaufort Sea. Production figures through 2006 are provided in Table 3-9.

Table 3-9. OCS Northstar Project Yearly Production Totals

	Total Unitized Yearly Production Volume[a] (Barrels)	Total Unitized Average Day Production Rate[a] (Barrels/Day)	Yearly Production Volume from Federal Leases (Barrels)	Average Day Production Rate from Federal Leases (Barrels/Day)
2001	1,265,883	20,417	225,834	3,642
2002	17,902,989	49,049	3,193,893	8,750
2003	22,970,112	62,932	4,097,868	11,227
2004	25,079,017	68,522	4,474,097	12,224
2005	22,421,483	61,429	3,999,993	10,959
2006	18,810,628	51,536	3,355,816	9,194
Total	108,450,112		19,347,501	

[a] Total unitized production is the volume of production from the entire unit, both from state and federal leases. The state leases are allocated 82.160% of the total unitized production and the federal leases are allocated the remaining 17.840%.

Source: MMS, Alaska OCS Region website, http://www.mms.gov/alaska/fo/North_Star/Northstar_production_table.pdf.

CHAPTER 4
COMMUNITY PROFILES

4.0 INTRODUCTION

This chapter provides comprehensive profiles of the study communities, covering community background and history, community characterization, social organization, subsistence and cash economy, and the local nexus of whaling and OCS. These community profiles benefited from input from secondary sources as well as from data gathered through the ethnographic component of the research, with the dual objective of providing a relatively complete description of the local interplay of whaling and oil and gas development in its own right and providing a context for better understanding results from the survey effort.

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BARROW

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4.1 BARROW

4.1.1 Background and History

4.1.1.1 Background

Barrow is the economic, transportation and administrative center for the NSB. Located on the Chukchi Sea coast 10 miles south of Point Barrow from which it takes its name, Barrow is the northernmost incorporated community in the United States (Figure 4.1-1). The Native Village of Barrow became a federally recognized and chartered tribal organization in 1940. Barrow was incorporated in 1958 as a fourth-class city under the territorial administration (Alaska Department of Commerce, Community and Economic Development 2006a). After statehood, Barrow became a third-class city and then, in 1974, a first-class municipality (Smythe and Worl 1985).

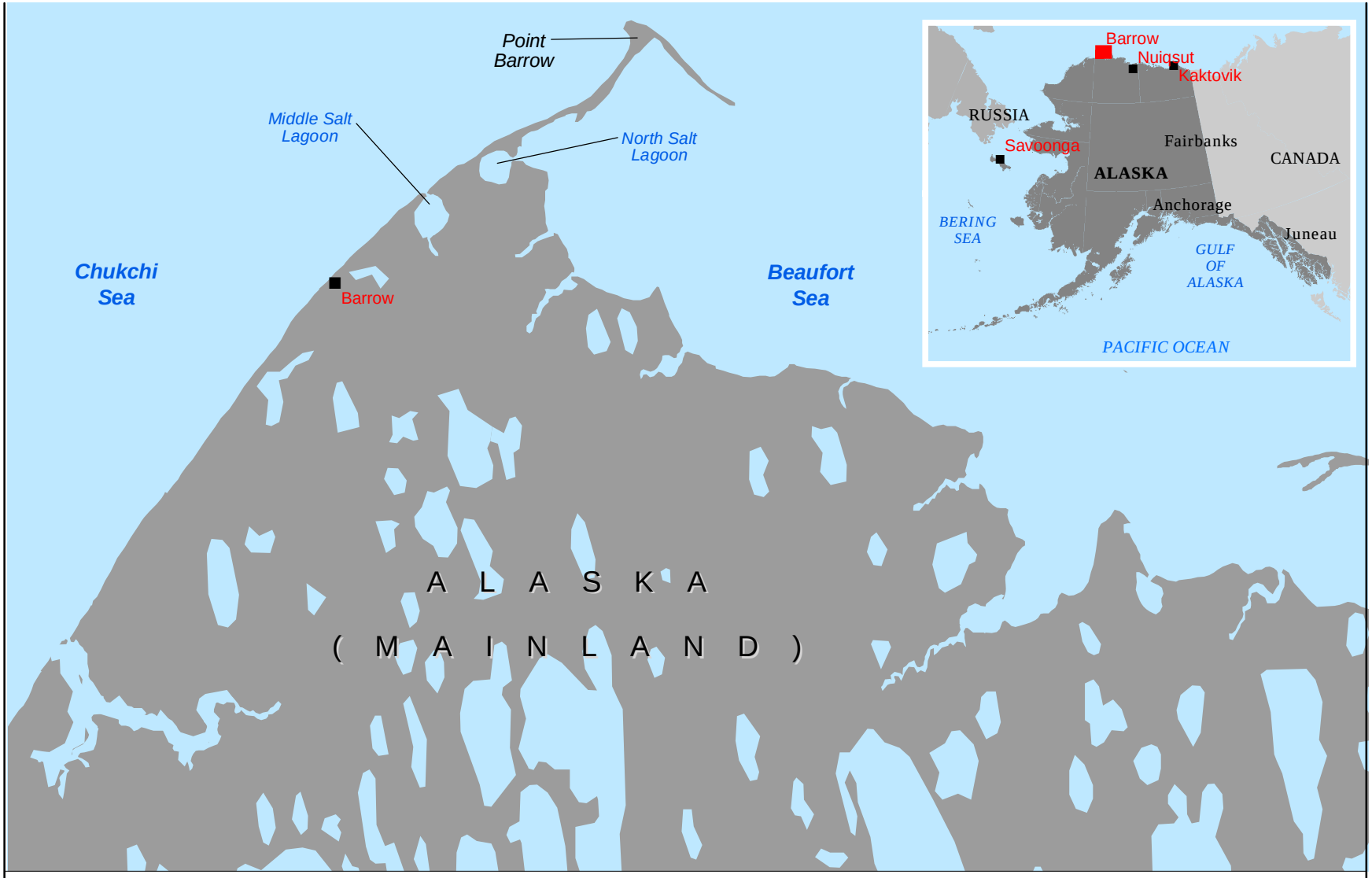
Barrow is by far the largest community on the North Slope, accounting for about 62% of the borough population. The 2000 U.S. Census enumerated 4,581 people. It is also the most ethnically diverse North Slope community—along with Iñupiat and Caucasians, which form the largest minority group, Barrow has a mixture of black, Filipino, Korean, Hawaiian, Thai, Samoan, Hispanic, and other racial/ethnic groups. In 2000, approximately 57% of the population identified themselves as Alaska Natives.

Barrow hunters utilize the sea ice, the coastal zone, and inland areas for subsistence hunting. Point Barrow (Figure 4.1-2), which is the demarcation point between the Chukchi and Beaufort seas, offers superb opportunities for hunting a diversity of marine and terrestrial mammals and fishes (Galginaitis et al. 2001). Marine mammals and caribou are both extremely important for Barrow residents, and especially for Barrow Iñupiaq residents. The bowhead whale is hunted during the spring and fall migrations. Because of its size and the relatively wide distribution of the resources upon which its population depends, Barrow's community subsistence harvest varies less from year to year than for the smaller North Slope villages (Galginaitis et al. 2001).

4.1.1.2 History of Barrow

Beginning about 4,000 years ago, the Barrow area supported several seasonal villages. Approximately 1,300 years ago, the Iñupiat began continuous year-round occupation of the area. The earliest occupants were bearers of the Birnirk culture. A Birnirk type site that includes the remains of 16 dwellings is located near Barrow at the base of the Barrow spit (*Pigniq*). Within the city limits of modern Barrow are remains of winter dwellings and associated features that are approximately 500 years old. This prehistoric village was occupied by the whale-hunting Thule people who used the bones of bowhead whales to construct semi-subterranean houses. The archaeological excavation of this site has yielded information concerning the material culture of the ancient residents and, in the process, strengthened the cultural connection between prehistoric whale hunters and modern Iñupiat (U.S. BLM 2005).

Point Barrow was named in 1825 by Captain Frederick William Beechey of the Royal Navy for Sir John Barrow, 2nd Secretary of the British Admiralty. At the time, Beechey was plotting the Arctic coastline of North America aboard *H.M.S. Blossom*. In 1837, Thomas Simpson of the



Source: NOAA-2003; ESRI 2003; MMS Alaska 2006

20,000 10,000 0 20,000 Feet

Scale: 1:240,000; 1 inch = 20,000 feet

Figure 4.1-1
Barrow
Regional Map

Source: Google Maps 2006

Figure 4.1-2
Barrow
Village Map

Path: P:\2001\1K118 Bowhead Whaling\5GIS\Mxd\Village_Maps\Barrow_google.mxd, 01/03/07, LeeJ

Hudson's Bay Company traveled from the east to Point Barrow in search of the Northwest Passage. Between 1847 and 1854, contact between Euro-Americans and the Iñupiat increased because of the influx of American whalers to the region and the continued exploration by Euro-American sailors. Notably among them was Rochefort Maguire, commander of the *H.M.S. Plover*, who arrived near Barrow in 1952 and spent roughly 2 years anchored 3 miles offshore (Bockstoce 1988). In 1871, 33 New Bedford whaling ships were trapped in the ice and crushed off Point Barrow. Five years later, another 12 whalers were lost near Point Barrow. Beginning in 1881, John Murdoch and Lieutenant Patrick H. Ray, members of the International Polar Expedition, collected ethnographic information over the course of 2 years at Point Barrow. Also in 1881, Ray established a meteorological and magnetic research station at Barrow under the auspices of the U.S. Army (BLM 2005).

The establishment of a shore whaling station at Barrow by the Pacific Steam Whaling Company of San Francisco in 1884 further intensified contact between Iñupiat and Euro-Americans. Whaling ships could not enter Arctic waters until the ice broke in late June. The shore whaling station copied the Iñupiaq methods of catching whales at narrow leads in the ice in spring as they moved near the shore to their summer feeding grounds. The station hired many indigenous residents to help crew the boats during the whaling season. Iñupiat and other Native people from as far as Siberia and St. Lawrence Island moved to Barrow in pursuit of wage employment, access to technologically advanced trade goods, and increased trade opportunities (BLM 2005). By 1890, 400 Iñupiat were engaged in shore whaling at Point Barrow alone, using 70 umiat (skin boats; sing. umiaq) and 10 wooden whaleboats (Freeman et al. 1998).

A mutually beneficial arrangement soon evolved whereby the indigenous whalers hunted bowheads, exchanged the baleen at the stations for money or trade goods, and kept the carcasses for food (Braund and Moorehead 1995). Steadily, the Iñupiat of Barrow and other coastal communities of the North Slope adopted the whaling gear of the Yankee whalers. In 1880, a foreign observer reported that nearly every umiaq that he saw equipped for whaling was fitted out with iron lances, darting guns, and manila lines (VanStone 1958). With the adoption of this new and more effective technology, participation by the indigenous people in commercial whaling became very lucrative, and some Iñupiaq boat captains accumulated sufficient capital to organize their own commercial whaling crews (Bockstoce 1986). The Iñupiat also quickly adopted other European technology to improve the success of their hunting activities. By the early 1880s, for instance, the Iñupiat of Barrow had acquired the most up-to-date repeating rifles (Bockstoce 1986). The use of the rifle made hunting seals, walruses, and caribou easier and reduced the need for sharing and cooperation within kin groups (Chance 1990).

In 1897, teacher/missionary William T. Lopp sent 400 reindeer from Teller, Alaska, to Point Barrow as a food supply for the crews of eight iced-in whaling ships (Olson 1969). The rescue team arrived to discover that the Iñupiat and other local residents had already saved the crews. The reindeer remained in Barrow, and the Point Barrow Reindeer Station was established. Barrow's Iñupiaq residents used the reindeer herds as a source of food and occasionally as a source of income when reindeer meat and hides were shipped to American markets (Carpenter 1928).

Contact with Euro-Americans brought more than economic change to Barrow and other North Slope communities. Pre-contact religiosity and ceremonialism changed in the late 19th century, partly as a result of contact with white traders and whaling crews, and in part as a result of the arrival of Christian missionaries (Lowenstein 1986). Professor Leander M. Stevenson began a Presbyterian mission at Barrow in 1890, but it was not until the arrival of Reverend Horatio R. Marsh in 1899 that the church became well established. By 1920, almost all of the adults in Barrow were Christians.

Between 1908 and 1914, the commercial whaling industry in the western Arctic gradually ended, and Barrow's Iñupiaq residents returned to whaling as primarily a subsistence activity (Bockstoce et al. 1982). At the conclusion of World War I, however, the worldwide fur trade accelerated sharply and the Iñupiat quickly turned to this activity in order to supply their commodity needs (Bockstoce 1986; National Science Foundation 2000). For some individuals, income from trapping exceeded what had been possible from commercial whaling. An annual income of $3,000 to $4,000 (about $40,000 to $55,000 in 2007 dollars) was not unusual (Chance 1990). By the 1920s, Iñupiat were using the large sums that could be garnered from running trap lines to capitalize their subsistence pursuits (Jorgensen 1990). Outboard motor-powered boats, shotguns, rifles, and binoculars were purchased to harvest and transport sea mammals, and portable camping goods, from thermos bottles to stoves, soon came to be used. Data on the subsistence bowhead catch show a substantial increase for the period 1920-1929. However, unlike commercial whaling, trapping required that some subsistence activities be less actively pursued, mainly early and mid-winter sealing and late winter-early spring caribou hunting (Chance 1990). Furthermore, trapping cut deeply into the winter period previously devoted to community activities and affected long-standing patterns of family and village cohesion (Chance 1990).

Contact with the outside world continued in the form of visits from federal officials (most notably Bureau of Indian Affairs [BIA] employees) and longer stays of school teachers and missionaries (Lee 1998). In 1901, a U.S. Post Office was opened in Barrow, and a hospital was constructed in 1920. However, the collapse of the market for furs caused by the stock market crash of 1929 and repeal of the embargo on Russian furs following the recognition by the United States of the Soviet Union in 1933 caused another economic downturn in Barrow and other North Slope communities (Bockstoce 1986). As this source of income disappeared, a more self-sufficient subsistence mode of life and earlier patterns of cooperation and interdependence reemerged (Chance 1990; Spencer 1959).

It was not until the onset of World War II that North Slope villages experienced economic relief, this time mainly in the form of public sector jobs. Military bases were established along the Arctic coast, and many Iñupiat served in the Alaska Territorial Guard or were absorbed into the regular ranks of the U.S. Army (Chance 1990; Klausner and Foulks 1982). World War II-era military exploration of petroleum reserves and post-war government defense projects such as the U.S. Air Force's DEW Line sites led to a further increase in employment opportunities (Chance 1990). The exploration on Naval Petroleum Reserve No. 4 (now the NPRA) prompted the establishment of the Naval Arctic Research Lab (NARL) near Barrow in 1947, which added employment. To take advantage of these job opportunities, some Iñupiat moved to Barrow from other North Slope villages. Iñupiat found jobs as tractor drivers, carpenters, mechanics, machine operators, boat skippers, office support, and laborers and received standard wages. Although

these jobs were taken primarily by men, women started to enter the labor force as new jobs opened in education, health, and other government services (Kruse 1984). In addition to wage employment, government assistance programs, such as Old Age Pensions, Aid to Dependent Children, and General Relief, were made available to qualifying Iñupiaq households.

By the 1950s, Barrow began to resemble a typical rural American town. The availability of increased cash was enough to support several new businesses. In 1951, the community had five stores, two theaters, a dance hall, and a beauty shop (Worl and Smythe 1986). A hotel was also built, and in 1954 nearly 300 tourists visited Barrow. Between 1947 and 1953, the Alaska Native Service initiated a housing program with support from the U.S. Navy to provide 100 new frame houses in Barrow. Roads and an airport were constructed (Worl and Smythe 1986). A sanitation program was adopted, and refuse was collected on a regular basis. In 1946, generators were introduced to Barrow to supply electricity. In 1937, a natural gas field was discovered outside Barrow; however, it was not until 1963 that the community acquired access to this source of heating fuel (Dupere & Associates, Inc. 1973).

In 1972, the NSB was incorporated as a first-class borough (it became a home-rule borough in 1974), and through its taxing authority received large revenues from Prudhoe Bay oil production (Hess 1993). The NSB was viewed as the vehicle to unify Barrow with the other North Slope villages, to maintain their political autonomy, and to protect their land ownership and utilization, while allowing the Iñupiat to benefit from petroleum development on the North Slope (Worl and Smythe 1986). A major focus of the NSB was to improve the quality of life in North Slope communities through a range of large Capital Improvement Program undertakings. A 1973 survey of public services in the NSB noted that Barrow was by far the most populous community in Alaska without a safe source of potable water or piped water and sewer system (Dupere & Associates, Inc. 1973). In 1978, Barrow received its first public pure water source with the construction of a dam to convert a tidal lagoon into a freshwater lake, a water line from the lake into Barrow, and a community water storage tank. Between 1982 and 1985, a state-of-the-art, 3.5-mile insulated underground tunnel known as the "utilidor" was constructed that contained water, sewer, and electric and telephone lines and provided service to roughly 1,000 households in Barrow, nearby subdivisions, and nearly all of the public buildings (Alaska Department of Commerce, Community and Economic Development 2006b).

By the late 1970s, the NSB was viewed by some North Slope residents as an agency run by (and sometimes for) Barrow residents (Smythe and Worl 1985). On the other hand, Barrow, more than any other North Slope village, has a history of speaking up and questioning the NSB's powers. The issue of transfer of powers was a major factor in changing the city to a first-class municipality; by becoming first class, the city council was able to acquire more direct control over the transfer of powers to the NSB (Smythe and Worl 1985). Currently, the member-owned Barrow Utilities & Electric Cooperative operates the water and sewage treatment plants, generates and distributes electric power, and distributes piped natural gas for home heating (Alaska Department of Commerce, Community and Economic Development 2006a, 2006b). The NSB provides all other utilities and is also responsible for refuse collection services and road construction in the city.

The inception of the NSB and Arctic Slope Regional Corporation in the 1970s led to the creation of hundreds of new jobs in Barrow. Non-Iñupiat as well as Iñupiat filled these jobs. The population of Barrow increased from 2,267 in 1980 to 4,581 in 2000 largely because of continual immigration of non-Iñupiat. Beginning in the early 1980s, an increasing number of non-Iñupiat families established permanent residence in Barrow (Smythe and Worl 1985). In addition, as a result of improved employment opportunities and public services in the smaller North Slope communities, many of the Iñupiat that lived in Barrow returned to their home villages (Knapp and Nebesky 1983). The overall result of this movement of people was a dramatic change in the ethnic composition of Barrow's population. Prior to the formation of the NSB in 1972, the Iñupiaq population represented 91% of the total (Smythe and Worl 1985). By 1998, the Native population in Barrow had declined to 53% (Circumpolar Research Associates 2004). The increasing numbers of non-Iñupiaq residents resulted in a new social unit that tended to limit its association with members of the Iñupiaq community to employment and occasional social contact (Worl et al. 1981). While the addition of a non-Iñupiaq social unit changed social dynamics in Barrow, Iñupiaq cultural values persisted and perhaps were even strengthened (Worl et al. 1981).

More recently, there has been a decrease in the resident population of Barrow. Declining operating revenues in both the NSB government and North Slope Borough School District have translated into reduced employment opportunities, evidently resulting in out-migration of non-Iñupiat (Circumpolar Research Associates 2004).

4.1.2 Community Characterization

Basic demographic information for Barrow has been presented in Chapter 3 for the year 2000. Overall population was 4,581, with 57% identifying themselves as Alaska Natives. Males composed 52% of the population, and females correspondingly 48%. The median age was 28.8 years. Barrow, like many rural communities in Alaska, has a large proportion of younger people; close to 40% of Barrow was under the age of 20.

Over the past three decades Barrow has undergone a rapid increase in non-Native populations, a substantial rise in income levels and the introduction of modern facilities and infrastructure unequalled by any other community on the North Slope (Worl and Smythe 1986). Today, it is a modern community containing three hotels, several restaurants (including a Korean, a Mexican, and a Chinese restaurant), a dry cleaner, and a bank. The building that once was the 19th century shore whaling station is now a café (it is one of the oldest frame buildings in Alaska and is listed in the National Register of Historic Places). Barrow has a large grocery/merchandise store and several convenience stores. Numerous businesses provide support services to oil field operations on the North Slope. Plate A provides illustrations of the community and characteristics of the village of Barrow.

As the administrative center of the NSB, many regional health and social services are located in Barrow, including the Samuel Simmonds Memorial Hospital, which receives significant funding from the NSB. The hospital, which was constructed in 1963 by the Indian Health Service, is a 14-bed qualified acute care facility and state-certified medevac service (Alaska Department of

Commerce, Community and Economic Development 2006a). In 1996, the Arctic Slope Native Association assumed management of the hospital.

The NSB initiated a borough-wide high school program in 1975, and the provision of adequate educational facilities was a high-priority item in the NSB Capital Improvement Program (Underwood et al. 1978). When Barrow High School was opened in 1983, it was ranked as one of finest facilities in the state (Worl and Smythe 1986). (The high school's sports teams are named the Barrow Whalers.) In 1986, the NSB created the North Slope Higher Education Center in Barrow. The name was changed in 1991 to Arctic Sivunmun Ilisagvik College, and in 1995 the NSB passed an ordinance incorporating Ilisagvik College as a public and independent non-profit corporation. The 2-year college provides adult basic education instruction and offers the GED as well as coursework in a variety of vocational and academic programs leading towards certificate and associate degrees. The college manages the Iñupiat Heritage Center and the Tuzzy Consortium Library under agreements with the NSB.

The NSB Police Department's headquarters is in Barrow and has a 27-member police force. The Department operates a nine-cell corrections facility and a 24-hour dispatch center in Barrow (North Slope Borough Department of Police 2006). The city also has a superior court judge and full-time magistrate paid by the state.

The bus transit system in Barrow, together with an increasing number of private vehicles, allows continued interaction among family members and friends who have been dispersed throughout the enlarging city (Worl and Smythe 1986). Regularly scheduled passenger and air-cargo jet services provide Barrow's only year-round access. The other major mode of transportation between the North Slope and areas outside the region are oceangoing freight barges that travel to Barrow and other coastal communities in late summer (National Research Council 2003). The state-owned Wiley Post-Will Rogers Memorial Airport at Barrow is the regional transportation center for the NSB, with jet service connections to the state's larger cities. Communications in Barrow include phone service (including cellular [wireless] service), dial up and DSL internet access, an AM/FM public radio station, and a cable TV station. Some examples of community infrastructure are illustrated in Plate B. Barrow residents are able to participate in state government hearings through Alaska's legislative audio-conference network.

Residents enjoy Barrow's recreation center, which includes a gymnasium, two racquetball courts, a weight room, saunas, an ice rink, and a roller rink. Events held at the center include sports tournaments, Eskimo dances, and various celebrations. Other community activities include Piuraagiaqta (Spring Festival), Kivgiq (Messenger Feast), and Nalukataq, the celebration of a whale harvest.

The extensive array of NSB and non-NSB facilities and infrastructure in Barrow, as shown in Table 4-1, reflects the community's position as the economic, transportation, and administrative center for the NSB.

Community Characteristics

Whale bone arch

Tradition and modernity complement each other on the North Slope

Dancing at Nalukataq whaling festival

Brower's Cafe, site of North Slope's oldest whaling and trade station

Barrow - Plate A

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Infrastructure

Power lines built by the U.S. Navy are used by Barrow Utilities and Electric Cooperative

Community roads are used by a variety of vehicles

Barrow air passenger terminal

Barrow High School

Barrow - Plate B

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Table 4-1. Infrastructure Found in the City of Barrow

NSB Infrastructure	Non-NSB Infrastructure
• Ipalook Elementary School • Eben Hopson Sr. Memorial Middle School • Barrow High School • Borough Volunteer Fire Dept./EMS/Search & Rescue/Medevac • Large Department of Municipal Services building (Public Works) with a full-array of tools and parts in storage • Police station with Central Office for Police Chief • North Slope Borough Building: Community Center • North Slope Senior Housing & Services • Borough Public Library & School Libraries • NSB maintenance facilities, with an office, tools, parts storage, and a work area • Search and Rescue building, with communications and other equipment (snow machines, survival gear, helicopter, and so on) • Teleconferencing provided by Alaska Teleconferencing Network, Legislative Information Office, and North Slope Borough Teleconference Center • Teacher housing • Ilisagvik College (Community College) administered by the Ilisagvik College Corporation, which is an independent, public, non-profit corporation of the NSB with full power for governance of the college vested in the Board of Trustees. • North Slope Borough Wellness Center	• City of Barrow: Operates a city recreation center, ice rink, roller rink, community center, and several outdoor recreation areas (playgrounds, softball fields, etc.). • Barrow Utilities & Electric Co-op Inc. (BUECI). Power plant with seven generators using high pressure natural gas or diesel fuel for temporary back-up if necessary. • Water treatment facility (BUECI) • Sewage treatment facility (BUECI) • Water and sewage system (running water and flush toilets) (BUECI) • Iñupiat Community of the Arctic Slope: Organization working with oil/gas developers and military. • Iñupiat Heritage Center (Ilisagvik College) • Grocery stores owned by Arctic Grocery Inc, Alaska Commercial Co., and Arctic Coast Trading Post. • Wiley Post – Will Rogers Memorial Airport with runway lights and lighted wind indicator • Native Village of Barrow Iñupiat Traditional Government • State Troopers Post • State District Court (pres. 2nd District) • Barrow Arctic Science Consortium (BASC): A not-for-profit organization created by the NSB, the Ukpeagvik Iñupiat Corporation, and the Ilisagvik College for the encouragement of research and educational activities pertaining to Alaska's North Slope and adjacent portions of the Arctic Ocean. • 3 Hotels: Airport Inn, King Elder Inn, and Top of the World • Car/truck rental • KBRW AM/FM Radio Station • ASTAC Telephone system • Barrow Cable TV • Wells Fargo Bank (with automatic teller machines at various locations) • 9 Churches: Assembly of God, Baha'i Faith, Barrow Korean Church, Calvary Bible Baptist Church, Church of Jesus Christ of Latter-Day Saints, Cornerstone Community Church, New Beginnings Christian Fellowship, St. Patrick's Catholic Church, Utqiagvik Presbyterian Church

NSB Infrastructure	Non-NSB Infrastructure
	• Samuel Simmonds Memorial Hospital and Dental Clinic • Arctic Slope Native Association: Community services • Tuzzy Consortium Library (Ilisagvik College) • North Slope Borough Bus Service • Taxi cab services (4) • NAPA Auto Repair • Building and hardware supplies by Spenders Builders Supply Inc. • Correctional Center (funded and operated through contract with the State of Alaska • Multiple private businesses that provide locals and tourists with a variety of services, including restaurants, boat/marine parts, arctic tours, etc. • Speech, hearing, and language consultant services

4.1.3 Oil and Gas Development and Proximity to Village

The South Barrow gas field was the first significant gas discovery (1937) on the North Slope, and it was developed in 1963 by the federal government to supply fuel to Barrow residents. In the ensuing years, Barrow has experienced the lowest heating fuel and electrical costs on the North Slope (Circumpolar Research Associates 1999). The difference in costs is primarily due to Barrow's access to the nearby natural gas field for heating and electrical generation.

Barrow is located near the juncture of the Chukchi Sea and Beaufort Sea Planning Areas. Figure 4.1-3 illustrates active and historic OCS federal leases in the immediate area. Most of the subsistence whale hunting area near Barrow is in a portion of the Chukchi Sea that has been removed from leasing consideration in the 5-Year Offshore Oil and Gas Leasing Program for 2002-2007. The Kaktovik whaling area was also deferred from consideration for leasing. The next 5-year plan, for 2007-2012, is currently under development and a draft has been issued for public comment (02/06). The draft does not include any Alaskan deferral areas, although much public comment and the Alaskan Congressional delegation strongly support the continuation of the Barrow and Kaktovik whaling area deferrals.

Although there is currently no large-scale oil and gas development in close proximity to the community itself, Barrow residents are affected by oil and gas development in other areas of the North Slope because of the size of Barrow's subsistence hunting zone, which is the largest in the region. The documented Barrow subsistence use area extends beyond Wainwright in the west, to the Kuparuk River in the east, and south to the Avuna River. Inland use areas go beyond the Colville River to the foothills of the Brooks Range. One reason for this large subsistence hunting area is that, as the regional center, Barrow has incorporated residents from throughout the NSB. Many residents hunt in the areas where they were raised, which may include the subsistence harvest areas of other communities. For example, many Barrow residents with ancestral ties to

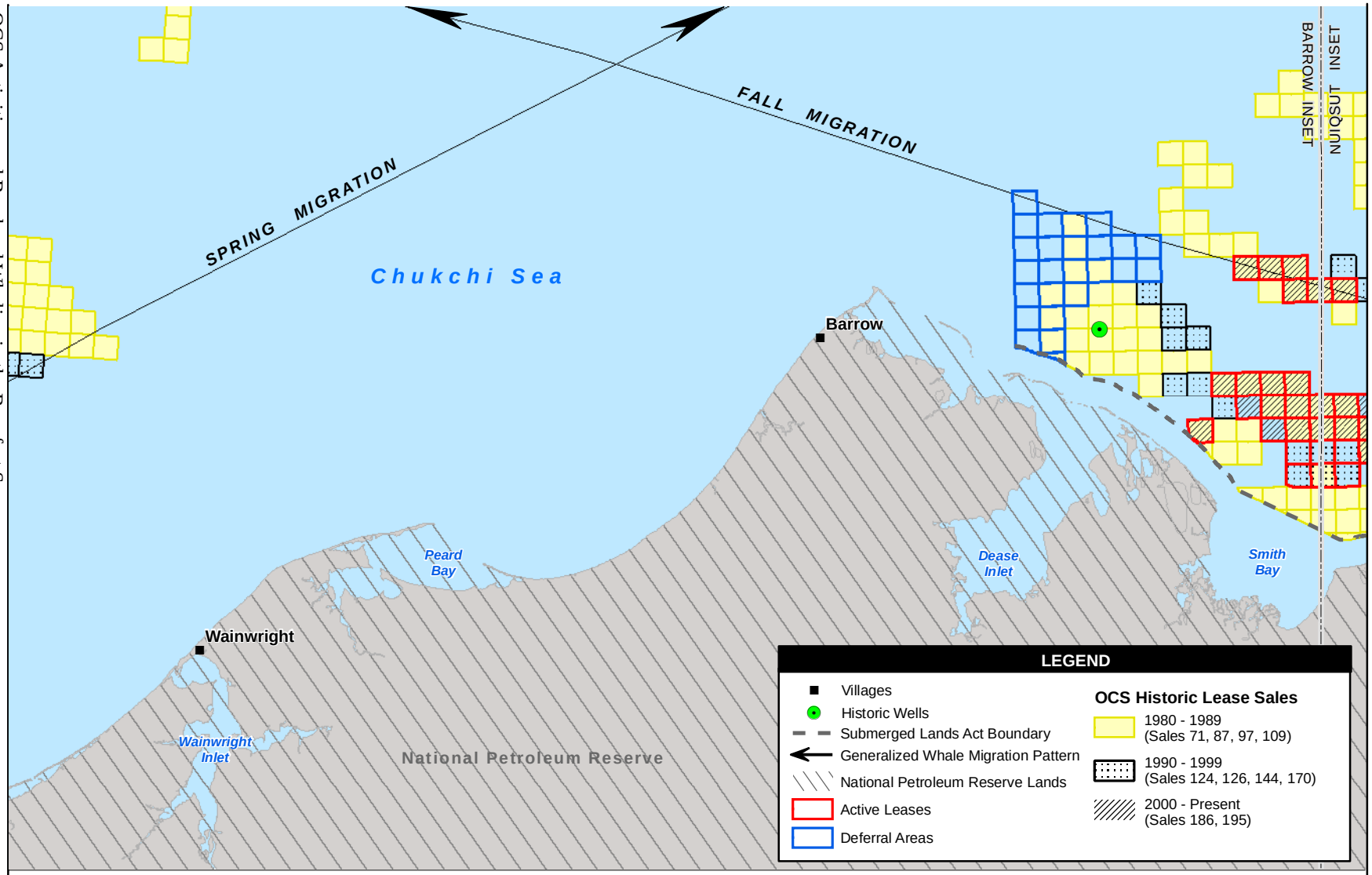

Figure 4.1-3
Active and Historic Federal Leases Closest to Barrow

the areas between Barrow and Nuiqsut continue to return to these traditionally used areas for subsistence activities; they share use rights to cabins, camps, and allotments in the areas and consider them to be part of their homeland.

4.1.4 Subsistence and Cash Economy

4.1.4.1 Employment and Labor

As the center of the NSB, Barrow has the most developed private sector and cash economy. Barrow is the administrative center of the NSB government, the City's primary employer. State and federal agencies also provide employment. The tourist industry has expanded, and arts and crafts provide some cash income. Ukpeagvik Iñupiat Corporation, the Barrow village corporation created under ANCSA, has emerged as one of the most successful village corporations in the state and is a major employer in Barrow. The company operates a hotel, construction company, engineering firm, and several joint ventures. Some aspects of the local economy are illustrated in Plate C.

While salaries on the North Slope, in both the private and public sectors, are high, it is equally true that the cost of living in the region is among the highest in the nation. In 2003, the cost of a "typical market basket" in Barrow was 93% higher than the cost in Anchorage (Circumpolar Research Associates 2004). Similar proportionate increases occur for vehicles, construction materials, appliances, tools, and other consumer goods. For example, according to a 2004 construction cost survey conducted for the Alaska Housing Finance Corporation, Barrow bears the highest material costs among 11 surveyed Alaska locations (Alaska Department of Labor and Workforce Development 2005). This exceptionally high cost of living more than offsets the higher income levels earned on the North Slope.

As noted earlier, Barrow and other North Slope communities have experienced an economic downturn in recent years. Unemployment in Barrow rose from 11.5% in 1998 to 19.4% in 2003; the Barrow residents who believe they are underemployed or that their skills and training are not fully used in their job increased from 12.3% to 25.4% (Circumpolar Research Associates 2004). Barrow's Iñupiaq residents are more likely to be unemployed or occupy part-time and seasonal positions than non-Iñupiaq residents. The primary reason for the high unemployment and underemployment rates is the decline in NSB government employment opportunities. The completion of water and sewer projects outside of Barrow led to a reduction of employment in the NSB Capital Improvement Program (Circumpolar Research Associates 2004). In addition, as oil and gas production and pipeline property depreciates, tax revenues to the NSB also decline. The declining revenues are causing significant budgetary challenges, leading to reductions in the scale of capital projects and increased efforts to efficiently manage operating income.

4.1.4.2 Subsistence Culture and Community

Barrow's location at the demarcation point between the Chukchi and Beaufort seas is unique among North Slope subsistence communities (Galginaitis et al. 2001). This location offers excellent opportunities for hunting a diversity of marine and terrestrial mammals and fishes. In 2003, over 91% of Iñupiaq households participated in the local subsistence economy, and 66% of

Labor and Wage Economy

While administrations may change, local and regional government remains an important source of employment

Small businesses provide services throughout Barrow

BASC and Ilisagvik College provide educational opportunities

Tourism is an important economic component

Barrow - Plate C

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the households indicated that half or more of their diet consisted of local subsistence resources (Circumpolar Research Associates 2004). In contrast, two-thirds of Barrow's non-Iñupiaq households do not use wild resources obtained from hunting, fishing, or gathering. This difference, together with the relatively high non-Iñupiaq population in Barrow, is a major reason for the lower harvest of subsistence resources on a per capita and per household basis in comparison to Nuiqsut and Kaktovik.

In 1992, the most recent year for which data are available on the subsistence fish and wildlife harvests in Barrow, 349 pounds per capita of wild resources were harvested (BLM 2005). Barrow residents rely heavily on large land and marine mammals and fish. Marine mammals composed approximately 55% of the total resources harvested, and land mammals composed 30% of the total. Bowhead whale, caribou, walrus, and whitefish accounted for approximately 85% of Barrow's annual subsistence harvest in terms of edible pounds in 1989. In 1992, the total harvest of marine mammals (bowhead whale, walrus, and ringed and bearded seals) accounted for approximately 72% of the total village harvest of all species, and bowhead whale provided the single greatest contribution of food to the community, at 54% of the total harvest. Land mammals (caribou, moose, and Dall sheep) contributed approximately 19% of Barrow's total harvest in 1992, and caribou was the principal terrestrial resource (17% of the total harvest). Close to half (45%) of Barrow households participated in caribou hunting in 1992; caribou is one of the most consistently eaten subsistence resources in Barrow. In 1992, fish constituted approximately 7% of the total harvest in Barrow, and broad whitefish was the most important fish resource (4% of the total harvest). Birds, such as eiders and geese, contributed less than 2% of the total harvest by weight; however, participation in bird hunting was high.

Despite the dramatic economic and social transformations that Barrow has experienced over the past three decades, traditional Iñupiaq kinship organization, the extended family, continues to function in a large sector of the community. This form of organization, through which many households are interrelated in regular and recurring patterns of interaction, also serves to integrate the community as a whole (Worl and Smythe 1986). The continuing communal and family ties are clearly evident in the bowhead whale hunt. The complex system of sharing and ceremonial celebration surrounding the hunt is perhaps most apparent immediately after a whale is caught:

> *As soon as a crew has caught a whale, word goes out and the other crews rush to help tow the whale to the edge of the lead, they and many community members help to land it on the ice and crews then help to butcher it. The captain and his wife must feed all the crews who help to butcher the whale—usually with boiled maktak, coffee and or tea in order to keep everyone as warm as possible. The next day, the captain and his wife must feed the entire town. A third of the uati, or Community share, is served to the community at this time, along with half of the heart, kidney, a quarter of the tongue, and half of the small intestines. The tavsi (the share of the successful crew) is divided among the captain and his crew. The rest of the whale is shared in very specific ways—some to the successful crew; some to all of the crews; some set aside for community feasts. Finally comes pilianiaq—when women who are present at the end of the butchering are invited to remove whatever meat is left.* (Ahmaogak 2000)

In addition to the initial distribution when a whale is landed, secondary distribution occurs during the annual series of ceremonies (Ahmaogak 2000). There are a number of occasions throughout the year for which whale meat and maktak are very important. In Barrow, for example, portions of each whale are saved for celebrations at Nalukataq, Thanksgiving, and Christmas and for various potlucks (Ahmaogak 2000). This widespread sharing of whale products among family members, friends, and the population at large is an integral part of what binds the people of Barrow together as a community. As one Barrow whaling captain noted,

> *When I get a share, I think about my family. I give some to my Mom in Fairbanks. She gets the choice pieces. I give some to other family and to friends who need it. When you are going to be a captain, you get a good feeling. There is a feeling of community, of being able to serve your friends and family. It strengthens the spirit of the community when you share the whale. It is essential to our family and to our community well being. It creates a social circle, a unity that we don't feel any other time. … There are times when two individuals do not get along, but when whaling time come, all the problems are left on land. When we are on the ice it is a whole new situation. Whaling is happiness. That is how we feel about it.*

4.1.4.3 Patterns of Change and Contemporary Issues

Early post-World War II research had predicted a waning of subsistence activities and the full integration of Alaska Natives into a cash economy (Jorgensen 1990). VanStone (1960), for example, noted that it seemed likely that as more young people left the villages to complete their education and became more oriented toward a money economy, they would become correspondingly disoriented from village subsistence activities and would seek economic opportunities away from the villages. What actually occurred, however, was that higher levels of household cash income were directly correlated with peoples' commitment to, and their returns from, natural resource harvesting (Kruse 1986; National Research Council 1999). Young men in Iñupiaq communities, for example, chose to balance wage employment with seasonal subsistence activities despite large numbers of high-paying job opportunities (Kleinfeld et al. 1983). Research showed that young men participated in major subsistence activities as much as the older generation, and those who had been exposed to Western influences through outside schooling tended to be *more* interested in subsistence (Kruse 1986).

On the other hand, as jobs in Barrow and other North Slope communities became increasingly professionalized, more individuals had to forego part of the subsistence hunting and fishing cycle due to time constraints (Bodenhorn 2000). Some residents have limited their subsistence harvests to the most desired species (Jorgensen 1990). In addition, individuals have adopted more efficient, reliable, useful and less-demanding subsistence technology (Lonner 1986). For example, those with financial resources frequently counterbalance limited "free time" by using motorized equipment (e.g., three-wheel all-terrain vehicles [ATVs], snow machines, and outboard motors for boats) to reduce travel time (Alaska Consultants, Inc. 1981). In short, cash derived from wage employment did not replace subsistence but underwrote it (Lonner 1986).

The interplay between labor and subsistence activities has been brought into sharp focus by the budgetary crisis of the NSB, which, as noted above, has led to higher levels of unemployment

and underemployment in Barrow. A Barrow resident expressed his concern about the loss of wage jobs as follows:

> *People are getting let go from their jobs and what are they going to do? Without jobs, people cannot buy gas for subsistence. They can't go hunt. Jobs are important for subsistence, but the Borough is losing jobs when we need them.*

In the past, borough jobs were especially valued because the NSB government implemented generous "subsistence leave" policies, which eased the burden of making choices about the time to invest in wage work and hunting (Worl and Smythe 1986). In addition, workers irregularly absent from work for subsistence or other reasons were usually rehired (Kleinfeld et al. 1983). However, interviews with Barrow residents indicate that NSB jobs are now much harder to come by and working policies are more stringent since the start of the NSB's financial difficulties. One resident noted that this situation has changed peoples' participation in whaling activities: "Sometimes the crew members wait and wait for a job, then they get called and they cannot say no." The uncertainty of income-earning opportunities is forcing the wage-working hunters in Barrow to reevaluate the conditions for earning money and harvesting subsistence resources that provide sustenance for the family; products to share with relatives and neighbors; and a sense of meaningful connection with the social and cultural values that reinforce individual, family, and community identity.

4.1.5 Community and Whaling

4.1.5.1 Aboriginal/Historical Whaling in Barrow Area

As discussed above, Barrow and its environs have a long and continuous history of use and occupation by Iñupiaq whalers, as evidenced by numerous archaeological deposits. Before sustained contact with Euro-Americans, the Iñupiat moved seasonally between coastal and riverine environments, gathering at communally recognized locations for bowhead whale hunts or cooperative caribou hunts. After the whaling, Iñupiat would disperse to coastal and riverine winter residences (BLM 2005).

Euro-American contact began intermittently in the early 19th century and intensified with the shift of commercial whaling north of the Bering Strait in the 1850s. In 1884, the establishment of a shore whaling station at Barrow brought Iñupiat from other areas to Barrow in pursuit of wage employment, access to technologically advanced trade goods, and increased trade opportunities. Iñupiaq whalers gradually took over the shore-based whale harvest, with wealthier captains maintaining several crews (BLM 2005).

By 1910, commercial whaling had ended, and Barrow's Iñupiaq residents returned to whaling as primarily a subsistence activity. Unlike some whaling communities in Alaska, Barrow was able to maintain a high enough population to sustain whaling throughout the first half of the 20th century. The whale harvest in Barrow actually increased during the height of the trapping era, perhaps because the income generated in the fur trade allowed the formation of more whaling crews. The collapse of the fur trade during the Great Depression was followed by a significant drop in the number of whales caught. After World War II, increased wage employment

opportunities (e.g., NPRA, NARL, and DEW Line sites) attracted inland and coastal Iñupiat to Barrow (BLM 2005). The economic and demographic changes led to a marked expansion of subsistence whaling in the 1960s and early 1970s. With the ready availability of high-paying jobs, the money to purchase new whaling gear could be earned in less than 6 months, and younger men started crews (Bockstoce 1977; Brower 2004). The number of whaling crews in Barrow increased by more than 50% over the level in the early 1960s.

Beginning with the whaling season of 1978, bowhead whale quotas, instituted by the IWC, altered traditional whaling activities in Barrow by reducing opportunities for bowhead whale harvest. For several years the imposition of whaling quotas by the IWC greatly cut back fall whaling in Barrow. In 1982, the community struck and lost all whales allowed as its share of the small IWC quota. Four years later, Barrow whaling captain Percy Nusunginya took a whale after the quota had ended, believing the quote interfered with his relationship with the bowhead whale and his responsibility as a whaling captain to feed his family and the community. He pleaded guilty in a U.S. District Court and was jailed, fined, and ordered to abstain from whaling for 3 years (Hess 1999).

Over the ensuing years, the IWC quota has gradually increased, due in part to information collected from the NSB government's ongoing bowhead whale census off of Point Barrow, and Barrow's whaling crews have consistently been successful. The IWC quota is currently regulated by the AEWC, which annually decides how many bowhead whales each whaling community may take. Barrow has received the highest annual quota (see Table 3-5) because of its comparatively large population and high number of whaling crews (there are currently over 50 crews in Barrow).

4.1.5.2 Contemporary Whaling in Barrow

The main subsistence focus in Barrow is marine mammal hunting, and whaling in particular (BLM 2005). Bowhead whale hunting is the key activity in the organization of social relations in the community and one of the greatest concentrations of effort, time, money, group symbolism, and significance. Other harvested resources, such as caribou, waterfowl, and several varieties of fish, are vital for subsistence; however, they have less influence on the organization of social relations than whales.

According to Stoker and Krupnik (1993), whalers in Barrow recognize four general categories of bowheads based on size and body type: (1) ingutuq—a small, very fat whale with somewhat different tasting maktak and blubber, (2) inuguraq—a large ingutuq, (3) queraliq—a long, slender whale, and (4) tiptulaayuq—a very large whale.[7] All four variants are recognized by experienced hunters, either visually or, in some cases, by the sound of the blow. A tiptulaayuq, for instance, is said to blow with a deep, snoring sound. There is also a difference in taste preference, with the ingutuq being much preferred (Stoker and Krupnik 1993).

[7] This list may not be exhaustive, and other terms in the Iñupiaq language may have eluded the cited authors. For example, an "ingutuvaq" is a very large whale with soft blubber. Also, the orthography used by the authors should not be accepted as current, as the vowel "e" is not currently used to represent any sound in Iñupiaq. Thus, "queraliq" is usually spelled "qurliiq" by today's scholars.

Barrow whalers pursue the bowhead during the spring and fall migrations. During the spring, the passing whales are hunted at sea ice openings called leads. The first migrants are usually seen near Point Barrow in mid-April but may arrive earlier or later depending on ice conditions. Generally, the spring whaling season produces the majority of the whales landed in Barrow each year, and May is usually the most successful month (BLM 2005).

During the spring, Barrow whalers hunt bowhead whales from camps located along the coast from Point Barrow to the Skull Cliff area. There are approximately 30 to 40 spring whaling camps along the edge of the landfast ice. While the locations of these camps depend on ice conditions and currents, most whaling camps are located south of Barrow. The distance of the leads from shore varies from year to year. The leads are generally parallel to and quite close to the shore but occasionally break directly from Point Barrow to Point Franklin, forcing Barrow whalers to travel over the ice as far as 10 miles offshore. Typically, the lead is open from Point Barrow to the coast, and hunters whale only 1 to 3 miles from shore (BLM 2005).

Successful whaling captains traditionally occupy positions of considerable authority and respect in the community and have absolute authority over conduct of the hunt. It is also a position of considerable responsibility, material and otherwise (Stoker and Krupnik 1993). Prior to the start of the spring hunting season, the whaling captain and his/her crew readies their weapons and gear—the bombs are cleaned, gun powder is changed, the barrels of the shoulder gun are cleaned, sleds are prepared, gas and food are purchased, ropes are stretched for the plastic floats, and snow machines are repaired. In addition, any whale meat remaining from the previous year is distributed by the captain and all storage cellars are cleaned. If needed, the ugruk skins covering the frames of the skin boats are replaced.

The whaling captain also must decide on where to locate his/her whaling camp (Stoker and Krupnik 1993). Once a decision is made, the captain and crew lay out courses and build ice roads over which to sled the umiaq, gear, and supplies through what is often a maze of pressure ridges. For insurance, in case of ice movement, several such "roads" may be constructed during the season. The camp itself is situated on the shorefast ice at the edge of an open lead, usually within an indentation or "bay" in anticipation that whales may take shortcuts under projecting points and surface in such bays. Also, locating the camps at the heads of bays reduces the risk that the ice they are on will break free from the main body and drift away. For example, in the spring of 1997, an ice calving event trapped 142 people from Barrow on drifting ice. They were rescued by helicopter, largely due to personal locator beacons (Stoker and Krupnik 1993).

The umiaq is always kept at the edge of the open lead and is balanced on skids of ice ready for instant launching should a whale appear (Stoker and Krupnik 1993). The weapons, floats, and lines are always kept ready in the right side of the boat. The tent and all equipment such as snow machines is kept well back from the ice edge, to the right of the boat when facing the lead. A wall of snow and ice is usually constructed to the left of the tent and equipment, both as a windbreak and to conceal the camp. Since, during spring whaling at Barrow, whales always approach from the southwest (from the left of the boat), the idea is to have nothing visible on the ice edge to alert a whale before it comes within range. For the same reason, bright or dark colors are discouraged, noise is kept to a minimum, hunting of other species is prohibited when whales are in the vicinity, and the ice edge is kept as clean and uncluttered as possible (Stoker and Krupnik 1993).

When a whale comes within range and is judged to be approachable, the umiaq is launched as silently and quickly as possible, usually with the harpooner ("striker") ready in the bow (Stoker and Krupnik 1993). The umiaq is paddled quietly toward the whale or toward where the crew thinks it will surface. The whalers attempt to position the umiaq so as to approach the whale from the front, believing its forward vision to be poor. At the last instant the boat is turned to put the whale off the right side, and the harpooner strikes with the darting gun from point blank range (Stoker and Krupnik 1993).

If ice conditions are favorable, bowhead whaling in the fall may begin as early as mid-August and continue into October (BLM 2005). During the fall, whaling is a shore-based activity occurring east of Point Barrow, from the Barrow vicinity to Cape Simpson. Barrow hunters use aluminum skiffs with outboard motors to pursue the whales in open water, up to 30 miles offshore. The whaling crews do not establish camps, but rather leave from town on a daily basis (Ahmaogak 2000).

As soon as a crew has caught a whale, crews in the vicinity, alerted by the sound of the bomb or by CB radio, converge on the scene as rapidly as possible to assist in towing the whale if it is dead or, if it is not, to attach more lines and floats and fire additional bombs into it. Once the whale is dead, the flippers are lashed to the body or removed entirely to reduce drag, and all available boats link up in line behind the boat from which the whale was first struck to tow the carcass tail-first back to the beach or shorefast ice (Stoker and Krupnik 1993).

As soon as a whale is taken, word goes out by runner, snow machine, and CB radio, and many community members converge on the landing site to help with the hauling out and butchering. The whale is generally hauled out using ropes and marine block and tackle sets. A group of 20 to 25 people can butcher an average size bowhead in 6 or 7 hours using homemade flensing spades to remove first the maktak and blubber, then the muscle and tongue and internal organs, and finally the baleen. After butchering, the skull may be rolled off into the lead to feed marine organisms and to make amends to the spirit of the whale, and the remainder of the skeleton is left on the ice for polar bears, foxes, and birds (Stoker and Krupnik 1993).

The captain and his wife (with help from the crew members' wives) must feed all the crews who help to butcher the whale—usually with boiled maktak, soup, bread, coffee, and tea (Ahmaogak 2000). On the next day, the captain opens his home to the entire town in thanks and celebration and must provide whoever comes with food and drink (Stoker and Krupnik 1993).

Apugauti marks the last time a successful whaling captain brings his boat back to shore at the end of the whaling season. At this time, the captain's flag goes up on the beach and everyone in the community is invited to come eat for about an hour. For this feast, mikigaq (fermented whale meat, tongue, and maktak) and goose soup are prepared. These will be served along with Eskimo donuts, coffee, tea, Kool-aid, and cakes to celebrate the bringing up of the boat (Ahmaogak 2000).

Nalukataq is the final celebration of a successful season. The captain of the crew that has landed a whale decides when the celebration will take place, typically in the second half of June. The community-wide celebration lasts from late morning until the end of the Iñupiaq dancing late

that night (Ahmaogak 2000). The celebration is started with a prayer of thanks for the bounty the community has been given. Preparations for Nalukataq are organized by the wife of the successful whaling captain with help from other women in the community (Bodenhorn 2000). In Barrow the feast demands three separate servings, each of which involves different sorts of foods as well as different kinds of preparation—at noon, soup, coffee, and tea; at 3:00 p.m., mikigak, stewed fruit, coffee, and tea; at 6:00 p.m., quaq (frozen meat), multiple kinds of maktak, cakes, coffee, and tea. The quantity of food must be sufficient to feed the entire community as well as the large number of visitors, family, and friends who have come to Barrow for the event (Ahmaogak 2000). Illustrations of some aspects of the subsistence cycle are provided in Plate D. The annual subsistence cycle for Barrow is described in Figure 4.1-4.

4.1.5.3 Cultural Context: Seasonal Round

As discussed earlier, unlike residents of Nuiqsut and Kaktovik, Barrow residents hunt the bowhead whale during both spring and fall. While the actual hunting of bowheads occurs for shorter or longer periods during the spring and fall, whaling involves preparations that take place throughout the entire year. Bodenhorn (2000) notes that Doe Doe Edwardsen, a Barrow whaling captain's wife, once suggested that a way to introduce the whaling cycle visually would be to begin with a picture of the blanket toss at Nalukataq—the culminating event of a successful whaling season. This image would be followed by a photo of hunters leaving to hunt the ugruk in July, which are necessary for skin boat covering. The message would be that the activity of whaling has no perceptible beginning or end.

The annual subsistence cycle for Barrow is shown in Figure 4.1-4. Once the spring whaling season is over, usually in late May or early June, subsistence activities diversify (BLM 2005). Some hunters turn their attention to hunting seals, walrus, and polar bears, while others go inland to fish or hunt for waterfowl and caribou. In June, Iñupiaq hunters continue to hunt geese and opportunistically harvest caribou, ptarmigan, and eiders. Caribou, the primary terrestrial source of meat for Barrow residents, are available throughout the year, with peak-harvest periods from February through early April and from late June through late October (MMS 2003a). In August, Barrow hunters also harvest marine mammals, eiders, and fish, depending on weather and ice conditions (BLM 2005). The hunting of ugruk is an important subsistence activity in Barrow because the bearded seal is a preferred food and because bearded seal skins are the preferred covering material for the skin boats used in whaling. Most bearded seals are harvested during the spring and summer months and from open water during the pursuit of other marine mammals in both the Chukchi and Beaufort seas (MMS 2003a). Walrus are harvested in June and July when they drift north with the floe ice, and if the pack ice moves close enough to Barrow. Freshwater fishing generally occurs from breakup, in June, through October. Barrow residents fish for Arctic cod year-round, but fish for broad whitefish, the most heavily harvested species, from June to October. Fish harvested in August include whitefish, grayling, salmon and capelin. Residents of Barrow harvest eiders during the "fall migration" in July. During the summer months families may go up the Colville River to harvest moose and berries until early September (BLM 2005).

If ice conditions are favorable, bowhead whaling in the fall may begin as early as late-August and continue into October (BLM 2005). Residents of Barrow, who have remained inland, hunt caribou if the animals are accessible; otherwise, they concentrate on fishing for grayling and

burbot. The subsistence fish harvest generally peaks in October (under-ice fishery), when whitefish and grayling are concentrated at overwintering areas. During November and December, Barrow residents also harvest ground (or parka) squirrels and ptarmigan, and, if weather and ice conditions permit and the animals appear close to town, seals and caribou. During the winter months, residents of Barrow harvest furbearers, such as polar bear, wolf, and wolverine (BLM 2005).

4.1.5.4 Whaling Crew and Non-whaling Crew Participation

The captain's wife and the wives of crew members are involved in sewing the boat covers of ugruk skins. Women are also usually permitted at the whaling camps to cook and to keep watch, and more rarely to go out as crew members (Stoker and Krupnik 1993). As described above, when a crew catches a whale, the captain's wife and crew members' wives are also responsible for preparing and serving food to large numbers of people on several occasions (Ahmaogak 2000).

In Barrow, as in the other villages, the wives of active and retired whaling captains are intrinsically involved in whaling activities, beginning with Nalukataq and throughout the year until the next whaling season begins. "Utqiagvigmiut Agviqsiuqtit Agnanich," otherwise known as the Barrow Whaling Captains Auxiliary, a local non-profit women's organization, was formed in the early 1990s to promote and enhance whaling culture; raise funds to offset the cost of whaling; and teach skills that are necessary for skin-sewing and other preparatory activities, including preparing the thread used to sew skin boat covers, skin-sewing itself, and preparation of the ugruk skin. The women work with the AEWC, obtain grants to promote videos to support their teaching of these skills, and coordinate and manage the distribution of discounts for whaling supplies through sponsorship from local stores.

Young children participate in some preparation for the whale hunt as well as camp activities and may also occasionally accompany crews while whaling. These experiences socialize children into the values and beliefs about whaling and its importance in Iñupiaq culture. The memories of an adult woman in Barrow about her childhood whaling experiences illustrate this:

> *My parents took us on the ice in the 80s. I started going with my father and brothers. Everyone would help with breaking trail, setting up camp, cleaning dishes, cooking, and keeping things on the sled ready to move. I would make fresh coffee and tea. I would sometimes stay up all night watching for whales and for* [polar] *bear. … Sometimes I would go out in the boat, especially if they were short of men.*

In addition, whaling incorporates those who do not participate directly in hunting or related activities; for example, those with wage labor jobs may help pay for whaling supplies. Others may contribute their time for brief periods before they are obliged to return to jobs. All such contributions are appreciated and acknowledged.

Subsistence

Dancing at Nalukataq whaling festival

Whale captain cutting maktak

Subsistence gear

Returning home from a successful seal hunt

Barrow - Plate D

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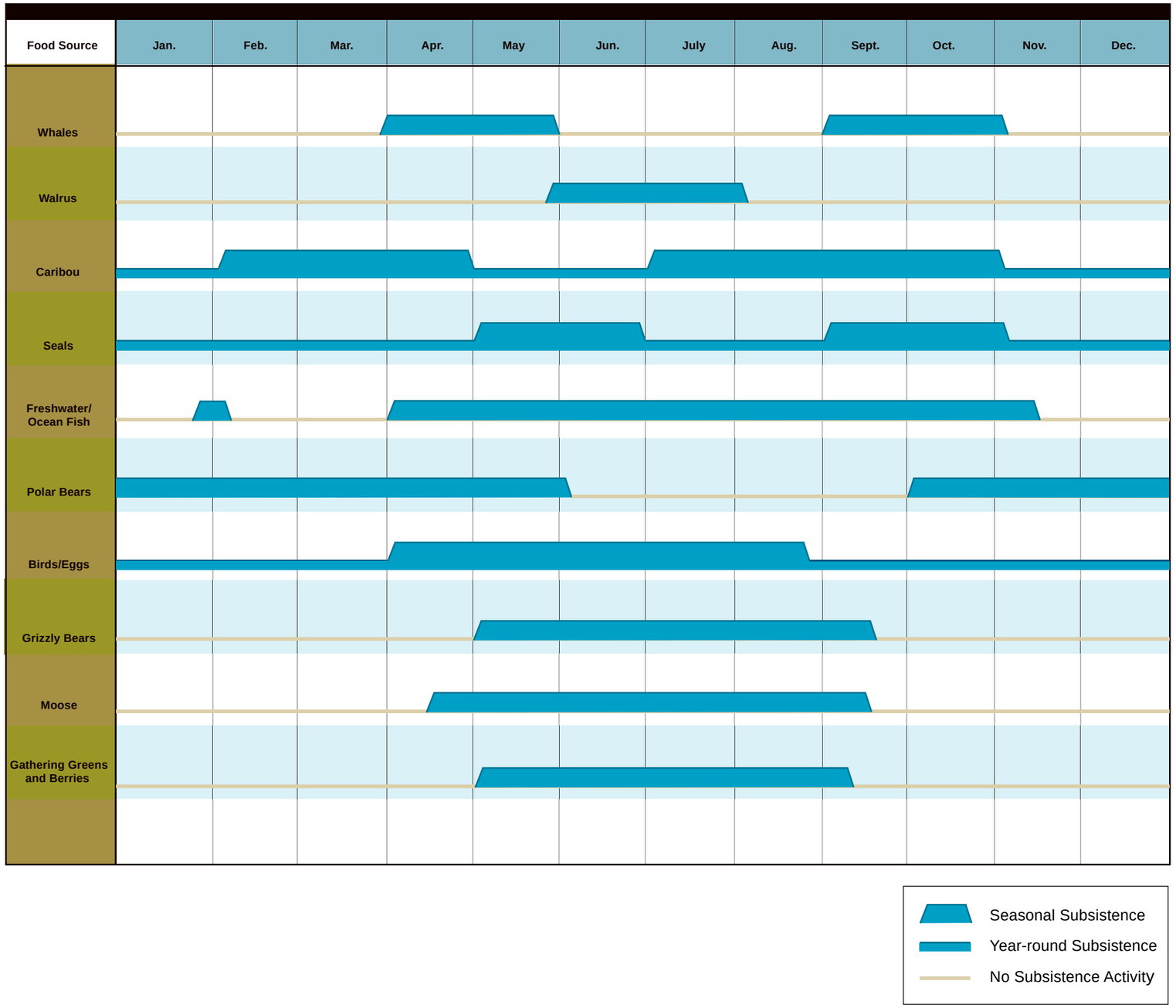
Barrow Subsistence Time-line



NOTES:

This chart is a graphical representation of an idealized annual subsistence activities calendar. It is intended to portray seasons of greater or lesser subsistence activity related to particular species or species groups, but it does not attempt to show varying levels of effort within active seasons or compare levels of effort across different species or activities.

Sources: Galginaitis et al. 2001
Ethnographic Field Notes 2004
ADF&G Community Profile Database

Figure 4.1-4
Subsistence Hunting Calendar for Barrow

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4.1.5.5 Whaling Technology

While today's subsistence whalers have added technological advances such as bomb darts, aluminum boats, Global Positioning Systems (GPS), float-incorporated radio transmitters and portable receivers to locate whales taken but out of sight, and two-way radios to the repertoire of whaling apparatus, the basic pattern of pursuing bowheads from shore camps during the migration season with hand-thrown harpoons, with all the accompanying dangers, has not changed. The Barrow spring whale hunt is staged from the edge of ice leads using mainly skin boats, which are easier to maneuver than aluminum skiffs and do not transmit sounds that could alert nearby whales (Stoker and Krupnik 1993). The average skin boat used at Barrow requires six ugruk skins for the cover and is 21 to 28 feet long and, 5 to 6 feet across the beam, and weighs 300 pounds or so when dry. The skins (with the hair removed) are sewn together, stretched over the boat frame, lashed in place with rawhide thongs, and allowed to dry. The skins are generally replaced every other year, depending on their condition. The frame itself is made primarily of wood, imported for that purpose in recent years (in the past the frame was fashioned of driftwood, whale bones, and baleen) (Stoker and Krupnik 1993). Sewing the skins for the boat cover is very labor-intensive and can be expensive, as the task is usually performed by professional sewers invited by the whaling captain's wife (Bodenhorn 2000). In addition, because the majority of whaling captains now hold jobs during most of the year (or at least during the summer ugruk hunting season) they may have to buy skins from successful, non-boat-owning hunters. To avoid these costs some spring crews use fiberglass boats made in the shape of the skin boats.

In the fall, Barrow whalers primarily rely on aluminum skiffs with outboard motors to hunt bowheads in open water. However, a variety of craft may be used during this hunting season, including small cabin cruisers (Stoker and Krupnik 1993). One important requirement is that the boat be a sea-going vessel that can withstand rough seas. According to a Barrow whaling captain, smaller boats are easier to maneuver in the ice and most crews use what's called a modified eighteen footer (MMS 2006). Plywood is used to build up the sides of the boat to help keep the boat from being swamped in large swells. Some aspects of whaling technology are illustrated in Plate E.

Although many forms of modern technology have been adopted by Barrow whaling crews, restrictions have been placed on the use of some technology. For example, the Barrow Whaling Captains Association has adopted the following rules regarding the use of snow machines and outboard engines:

> *Whaling captains should caution their crew members to restrict the use of snow machines during the time whales are running. Those snow-mobilers who do not belong to a whaling crew are not to go beyond certain points designated on the trails to the whale camps.*
>
> *Outboard motors are to be used only at times they are needed:*
>
> *a) to go after a wounded whale*
>
> *b) emergency situations*

c) *if it is determined that the whales are migrating a substantial distance away from the shore fast ice, between Walapah and Point Barrow. This shall be determined by radio contact with the whalers between the two points* (Freeman 1989).

With so few whales near the ice in recent years during the spring hunt, there has been a movement within the Barrow Whaling Captains Association to allow the use of motorized aluminum boats all along the lead (Wohlforth 2004).

The standard whaling gear will be only briefly described here. Subsistence whalers still use some of the same technology used by commercial whalers at the time of contact. Although aboriginal Alaskan whalers used toggle harpoons made from bone or ivory, commercial whalers first used a toggle iron harpoon in 1848. The Iñupiat quickly adopted this material improvement on the technology. The whale bomb, shot from a shoulder gun, was invented around 1850. While effective in increasing the number of whales taken, many still escaped into nearby ice. The darting gun, designed to attach a harpoon, line, and float to the whale at the same time as shooting it with a bomb, was invented in 1865. Subsistence whalers also quickly adopted these innovations and still use these weapons essentially as they were invented (Bockstoce 1986:61-64). As discussed in Chapter 3, the current technology for harvesting whales is prescribed by the AEWC. Consequently, all four project communities utilize similar technologies.

While not all crews are as diligent as others in terms of preventive maintenance, the model is that all weapons are cleaned as soon after use as possible. The barrel of a shoulder gun is swabbed and cleaned between every shot. Once the darting gun is retrieved, it is seldom reused until it has been dried, disassembled, and cleaned onshore. Only in the most extreme cases will this be done in the boat. All tools will have a sharp edge but also a protective sheath and/or a secure and protected storage location on the boat.

The whale is first struck with a harpoon attached via a long rope to a float. The harpoon is attached to a long wooden handle to facilitate throwing it at the whale. In almost all cases, a darting gun is also attached to this wooden handle in such a way that when the harpoon penetrates the whale it will trigger the darting gun to propel a "bomb" into the whale with a delayed fuse. The wooden handle, once it separates from the harpoon, will then float and allow the expensive darting gun to be retrieved. Different whaling captains use different lengths of fuses, from 4 to 8 seconds, and different amounts of black powder.

Since 1988, hunters in Barrow have tested a new titanium-encased penthrite "super bomb," created in Norway specifically for harpoon-mounted darting guns. The bombs have resulted in many instant kills. However, most whalers still use the black powder explosive bombs rather than penthrite-based bombs, which are still under development. Whalers assemble most of their bombs themselves with black powder, fuse, and primer.

The lance, a long metal shaft with a sharp point, is used to make sure that the whale is dead once it is immobilized on the surface by one or more whaling bombs. All boats also carry butchering tools—wooden poles with sharp hooks, long knives of various shapes with long handles, and other implements to facilitate towing the whale (making holes to tie up the flippers, or cut them off, and

Whaling Technology

Sleds used to haul whaling supplies

Aluminum boats are typically used during fall whaling

Umiaks, or skin boats, are typically used during spring whaling

Whaling harpoon with sleeved bomb mechanism

Barrow - Plate E

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to attach the tow rope). Many more knives, of even more shapes and sizes, are used to butcher the whale. Hooks on long wooden handles or attached to long ropes are used to provide tension to facilitate butchering the whale. Short meat hooks are used to help butcher the meat of the whale. Hooks with ropes and short hooks are used to drag and carry the butchered meat and maktak. Files and, at times, a grinder are used to sharpen these tools—although most whalers maintain that a file is preferred, as the grinder leaves a rough edge that dulls more quickly.

Boats with outboard motors are widely used for towing dead whales. During the fall hunt, when whaling crews may travel more than 25 miles offshore, towing a whale to shore can take as long as 10 hours (MMS 2006). The meat starts to spoil anywhere between 12 to 24 hours after the whale is caught (Stoker and Krupnik 1993).

Over the years Barrow residents have responded to concerns that traditional knowledge systems associated with whaling are being lost. For example, some whaling captains were having a difficult time finding sewers because an insufficient number of young women were being trained in the art of skin sewing. A 3-day workshop was conducted on the braiding of caribou sinew into thread to be used in sewing umiaq covers (National Science Foundation 2000). The workshop was attended by 26 people, among them expert skin boat seamstresses, whaling captains' wives, curriculum developers from the school district, college students earning a credit in Iñupiaq studies, and young women hoping to become acquainted with the skill for the first time.

The Barrow Whaling Captains Auxiliary has also been instrumental in preserving traditional knowledge. As noted above, this organization was established to promote and enhance whaling culture. The Barrow Whaling Captains Auxiliary has been successful in obtaining grants for teaching necessary skills to continue subsistence whaling, such as sinew sewing and how to prepare ugruk skins for construction of a skin boat.

4.1.5.6 Crew

The AEWC defines a "whaling crew" as "… those persons who participate directly in the harvest or attempted harvest of the bowhead whale and are under the supervision of a captain" (AEWC 1995:4). Section 4.1.5.4 above discusses "crew" in its more expansive meanings, but the AEWC definition corresponds closely to the Barrow category of those people who participate in the spring and fall whaling seasons. These individuals are regarded as the core and most active members of their respective whaling crews and will be the focus of this section. As discussed above, however, not all crew members participate every time the crew's boat or boats go out scouting for whales.

A whaling crew in Barrow during the spring hunt typically consists of 5 to 10 persons. The average crew size during the fall hunt is three people; some of the smaller boats use only two crew members (MMS 2006). Crew members are often family members, but, according to one Barrow whaling captain, in principle "anyone can join." Persons are often asked to become members of a particular crew, and individuals can ask to join a crew. Barrow crews are often joined by residents of other communities for spring whaling (BLM 2005). In particular, Nuiqsut residents participate in Barrow's spring whale hunt through close family ties in that community.

The whaling captain must recruit (or maintain from prior seasons) a group of competent and experienced crew members. And he must accumulate enough resources to feed and shelter his crew throughout the hunting seasons. The costs of the major equipment, supplies, and services necessary to participate in whaling are high (Worl 1980). Examples of long-term and annual expenses incurred by a whaling crew in Barrow are listed in Table 4-2. Although each crew member must bear some of the expenses, much of the cost is incurred by the captain. Yet, if his crew is successful in landing a whale, the whaling captain keeps only a small part for himself and his immediate family; the rest he gives away, as each captain is tied by tradition to the ethic of generosity (Hess 1999; Lowenstein 1986). Today, as in the past, an individual can only launch his own whaling enterprise if he has been economically successful during the 8 or 9 months between whaling seasons (Lowenstein 1986). This requires many months of wage labor and hunting activity.

In addition to supplying most of the hunting gear, the whaling captain is responsible for the safety of the crew. Captains need a thorough knowledge of ice, currents, weather, where to strike the whale, and when to "pull back" and head home when the crew's safety becomes an issue. The following statement recorded in this study during an interview with a Barrow whaling captain illustrates the importance of knowledge and experience, and raises concerns about the future of whaling:

> *In the future people will be using motorized boats more to hunt because I think the younger people are losing some of the skills about being quiet and patient. You also have to know how to select the right whale, the correct length and size. That is the job of the captain. He also has to know about weather and climate change, and ice conditions. The ice is thinning and captains have to know about ice to keep their crew safe. The sounds in the ocean are changing too, especially with seismic activity, ships moving back and forth, and the noise from our newer ways of life. When you go out there, it is a life-threatening situation. Storms, big rolling waves, and towing a whale make it very dangerous. Our captains have to know about those things in the future to preserve whaling and keep their crews safe.*

4.1.5.7 Beliefs and Values about Whaling

Barrow has undergone a dramatic social and economic transformation over the past century, but the community's beliefs and values about whaling have remained relatively unchanged. One of those beliefs is that it is whaling itself that has helped individuals, families, and the community as a whole weather those changes. The following quotes from Barrow residents recorded during this study reflect a conviction that, should the bowhead whale hunt end, the social fabric of the community would be irreparably damaged:

> *If there is no whaling, there is no glue. Whaling is the social glue that holds us together. If there was no whaling, it might break us given all the other pressures.*

> *Whaling knits our family together. It is such a big task* [whaling] *that it takes all of us to whale. The extended family has to stay healthy to whale. If people only took care of themselves, then someone is being selfish and everyone would suffer.*

Table 4-2. Supplies and Services Necessary to Participate in Whaling in Barrow

Examples of long-term purchases

- Fall whaling boat (motor, etc.)—capable of navigating rough seas in the fall
- Navigational equipment (personal locator beacon, CB radio, GPS, etc.)
- Other equipment specific to whaling: darting guns, shoulder guns, lances, harpoons, winches, block and tackle, butchering utensils, etc.

Examples of occasional expenditures that are incurred only with a successful hunt

- Feeding everyone who comes to help butcher: coffee, tea, uunaaliit (hot boiled maktak); this is likely to be for well over 100 people.
- Feeding entire community. This happens on three different occasions, each of which varies slightly.
  (a) Immediately after the catch, a hot meal is served at the house of the whaling captain couple for all who wish to attend. The niqipiaq, or real food, is whale—which demands considerable time to cut up and cook. As well, stewed fruit, Eskimo donuts, sometimes cake, coffee, tea, and cold drinks are prepared for 2,000± [sic] people. Paper plates, cups, towels are supplied.
  (b) At appugauti (when the whaling boat is brought up for the last time of the season), community members are invited to eat on the beach. The captain and crew members have gone geese hunting in order to provide the basics for goose soup (demanding equipment needed for inland hunting); mikigaq (fermented whale meat and blood) has also been prepared, demanding special containers as well as close attention so that the fermentation process does not go wrong.
  (c) Nalukataq is the most elaborate celebration of all and will attract not only community members but visitors from many other communities. All are welcomed. In Barrow the feast demands three separate servings, each of which involves different sorts of foods as well as different kinds of preparation: at noon, soup, coffee, tea; at 3 p.m., mikigak, stewed fruit, coffee, and tea; at 6 p.m., quaq, or frozen meat, multiple kinds of maktak, cakes, coffee, and tea. The preparation is organized by the whaling captain wife, although the preparation itself is by no means carried out only by the women connected to the successful crew.
- Freight costs incurred shipping meat to other communities (sometimes, if as a gift from the whaling captain couple, at their expense; if as part of a share, at the expense of the receiving community).

Equipment that lasts more than one season, but needs regular replacement

- snow-machines
- snow-machine parts
- sleds
- skin boat frame
- Coleman stoves, lanterns, etc.
- fur for clothing: parkas, socks, hats
- tents, tarpaulins for covering sleds, etc.
- skin boat cover (approx. every 2 years), women to sew; men crew to put cover on frame
- braided sinew or other thread, either made by whaling captain wife and helpers, or purchased
- storage containers, e.g., for mikigaq (currently kept apart to lessen likelihood of botulism)
- materials for setting up Nalukataq: windbreak, tables

Annual replacement needed

- Qatignisi—white snowshirts that are necessary for hunting on the ice, especially for whales—the responsibility of wives.

Ongoing expenses

- food
- clothing
- ammunition: whale bombs, shells
- fuel for snow-machines, Coleman stoves, lanterns, trucks for transporting boats out to launching site, etc.

Source: Bodenhorn 2000.

> *Socially, whaling keeps us stitched together. Our family has some problems, but when spring comes we work through that and whaling becomes a healing process for us. We are a family then and without whaling I don't know how that healing would happen.*

Related to this notion of whaling as the "social glue" is the stress that Barrow hunters place on the need for harmony and cooperation during whaling activities. As one Barrow crew member noted during an interview, "If everyone does not work together, then things will not go right." This sense of working together and camaraderie is especially strong among crew members, but it extends to all other whaling crews as well. For example, one of the rules of the Barrow Whaling Captains Association is that, if one crew attempts to strike a whale and misses, it must withdraw for a day to give another crew a chance (Bodenhorn 2000).

Participation in whaling continues to be an important element of social status in Barrow, with the position of whaling captain commanding particular authority and respect. At the same time, the position of whaling captain is one of considerable responsibility. Barrow whaling captain Burton "Atqaan" Rexford noted:

> *As a whaling captain, I am responsible for feeding my community and for the safety of my crew. For my people, the greatest honor is to be a whaling captain, but it is also the greatest responsibility. You must consider many things to become a whaling captain because once you do, the community will depend on you and you cannot let your family and your community down. … My honor and dignity as a whaling captain are of the utmost importance to my peers and colleagues in the Barrow Whaling Captains Association and the Alaska Eskimo Whaling Commission. Without honor and dignity, a whaling captain loses face with the whaling community and loses respect and prestige one attains through many years of involvement as a member of the whaling community.* (MMS 2006)

This same Barrow whaling captain also eloquently articulated the relationship between Barrow hunters and the bowhead whale:

> *The bowhead is our brother. Our elders tell us that the whales present themselves to us so that we may continue to live. If we dishonor our brother or disturb his home, he will not come to us anymore.* (MMS 2006)

Statements recorded during this study from other Barrow residents also underscore the mutual cooperation and respect between the hunter and the whale:

> *It is a partnership, a relationship we have with the whale. Sometimes they just play with us. But, when the whale decides, then it gives itself to you if all is well with your crew and your attitude.*
>
> *If you have a clean skin* [for the umiaq], *the whale knows that. The whales know when things are right, when they are in order. If they are, the whale will make itself a gift to you. … You put the whale skull back in the ocean. We believe when*

we do that, the whale's spirit goes back and the whale is reborn. The elders taught us these things for whaling. Only God gives the whale. That is how the whale sees us, through God.

Barrow residents also still widely recognize the critical role a whaling captain's wife plays in encouraging the spirit of the whale to give itself to the hunters. Ronald H. Brower, Sr., a Barrow resident and Director of the Iñupiat Heritage Center, expressed this recognition as follows:

Among our great whalers, tradition teaches us that while man hunts the whale, it is the woman who maintains the sanctity of her home, feeding the needy, and caring for others with respect-it is to this kind of woman the spirit of the whale gives itself to. (ISER 1998-2004)

Finally, and perhaps most significantly, the people of Barrow acknowledge the connection between whaling and the future of Iñupiaq society, as illustrated in the following comments recorded in this study during a discussion about younger whaling crews, and their knowledge of whaling and observance of normative whaling techniques:

Here, see this harpoon. It has been in my family a long time. I received it from my father and I will give it to my sons. When I started whaling, I was a boyer [apprentice boy whaler who is old enough to wash dishes, fuel the fire, and get snow for water]. *You had to work hard to become part of the crew. You had to observe and listen to the elders about the whale and how to hunt him. You learned through experience how to approach the whale and where to strike to kill the whale quickly.*

The younger generation is different. They just go and make a whaling crew without knowing everything they need to. What we want here in Barrow is to keep on whaling. I do my best to pass on what I know about whaling to them. But, they do not always know what they need to know about how to use the bombs and some of the younger crews don't know how the proper way to distribute the whale. Some of them don't know where to strike and kill the whale. If the whale is lost, it hurts everyone because of the quota. They don't always know about ice conditions and they can get their crews in trouble. They do not recognize the effects of what they are doing by just making a crew and going out without the proper knowledge.

Although the above quote expresses disapproval of the behavior of some of Barrow's younger and less experienced whaling captains, the following statement recorded during an interview with a prospective captain demonstrates a clear recognition that whaling and the values, beliefs, and knowledge associated with this activity are an integral part of the cultural identity of Iñupiat in Barrow and other North Slope communities:

I plan on having my own crew in the future. I don't know exactly what it takes. I am relying on my brother to help me out. We all go whaling now. My youngest brother, I talked to him about how to build the boat frame. Some people buy the

frame from someone else because they don't know how to make it. It is important to me to know how it is made. I want to be able to make the frame of my own boat. I guess a lot of it has to do with my grandfather. He was a whaler, but he never told us many whaling stories. I have always wanted to make my grandfather proud. It makes me strive to learn my culture. I want to learn to navigate the way he did, not with a GPS, but knowing the wind and the currents, the land marks. That would make me a whaler. Striving for that knowledge inspires me. I would not have to worry about being lost. I want to keep our culture going. We are losing our culture and hardly any of my friends know much Eskimo [Iñupiaq]. *In school they try to teach us. I went through and I tried, but it wasn't really taught to me. My parents are the last generation that speaks Iñupiaq. I don't like to think about that. They might be the last generation. A big part of our culture is our language and our religion. Our language is going. Religion now is mostly for special occasions. Pretty soon all that will be left of our culture is whaling. We can't lose that.*

4.1.6 Nexus of Whaling and OCS

4.1.6.1 Threats and Opportunities: Cultural Constructions of Whaling and OCS Activity

Potential impacts on the community and its subsistence practices, particularly the harvest of bowhead whales, from offshore oil and gas development in the Beaufort Sea and Chukchi OCS have been issues of concern for Barrow residents for more than three decades. Hunters at Barrow are concerned that OCS activities, especially seismic exploration, have displaced fall migrating bowhead whales thereby affecting their subsistence hunt. One Barrow captain interviewed during this study expressed the added risks of traveling farther offshore to pursue whales that have been "deflected" from their migration paths by seismic activity:

There are typically 1-2 whales that set the path. The first 2 whales are the "leaders," and the rest of the whales follow. When the leaders deflect because of noise, the rest all follow.

A couple years ago it was 5 to 10 miles. Now we're going 25 miles. [During the last fall whale hunt] *we decided to go back in even though we saw whales, but it was too dangerous. I told the small boats to go back; we were in a 20-foot boat in 10-foot seas.*

Barrow whaling captains also noted the higher fuel costs of traveling farther offshore and recounted the high number of whales that have been lost because the meat spoiled while the whales were being towed over a long distance.

Most Barrow residents distinguish between the relative dangers of onshore and offshore oil and gas development, noting the especially devastating effects that an offshore oil spill would have on subsistence resources. One interviewed resident described the differences as follows:

On- and offshore development are different. Onshore there is less chance for contamination because they can control it. We can live with it onshore and work around its effects on our seasonal activities. Offshore it is a hostile environment with moving ice and heavy seasons. It is very risky. If they invade our hunting grounds, that is not acceptable to us because of the risk.

Seventy-five percent of our food comes from the ocean. We get some of our food from the land, but the ocean is our garden. Whales, beluga, walrus and seals are all foods we need. OCS is something people are concerned about because it can contaminate our garden. We know about Prudhoe Bay. The tundra is fragile and if you scar it, then it will last for years. We have seen that with oil development. But, if you spill oil in our garden, the scar will be forever.

We know the dangers from onshore development. It is the devil we know. We also know the ocean and it currents and what can happen when the ice moves in a way you don't ever think will happen. No one can tell us it will be completely safe. And if there is a spill offshore, it will spread fast. They have not convinced me they can clean up a spill in the conditions of the Beaufort Sea.

At the same time, the people of Barrow fully understand that wider political and economic realities may impinge on their way of life. As one Barrow resident interviewed during this study stated,

We live in a modern world. We know that. We know there is a national need for oil. Look at what the U.S. did in the Middle East when they wanted oil. Can we really resist development? Maybe our culture will be sacrificed to the national need for oil. The industry can provide some employment to our people, but they have not done much so far. But they can do that. What we need here is jobs. We can't go back to the way our ancestors lived. The genie is out of the bottle now. We need to be able to live with technology and maintain our culture.

4.1.6.2 Agents of Change

As described above, the experience of undergoing extensive social and economic transformations is not new in Barrow. During the commercial whaling period there were influxes of outsiders that brought dramatic shifts in the economic, social, and cultural institutions. Other fluctuations have occurred during different economic cycles: periods of relative prosperity associated with fur trapping, U.S. military and arctic contractors' employment, and the NSB Capital Improvement Program boom, followed by periods of downturn, the most recent caused by a decline in tax revenues derived from oil-field facilities. As a consequence of the changes it already has sustained, Barrow may be more capable of absorbing additional changes as a result of development than would smaller, homogeneous North Slope communities such as Nuiqsut and Kaktovik (MMS 2002).

Yet, many Barrow residents have a pessimistic attitude about the community's future due to what may be an unprecedented number of perceived threats to their subsistence resource base.

As noted above, the noise impacts and exploration risks Barrow residents have fought so hard to mitigate now may be joined by the risk of a catastrophic oil spill. On top of these threats are the deleterious effects of large-scale climate changes on the bowhead subsistence hunt. These climatic effects are increasingly becoming more apparent as the earlier recession of the sea ice each year increases the danger of whaling by creating poor ice conditions during the spring hunt and rough sea conditions in the fall (Wohlforth 2004). According to one Barrow whaling captain interviewed during this study,

> *Before the ice did not break. Now the ice is always breaking. We used to know the currents, when the ice would go in, come out—nowadays, it is unpredictable.*

The National Research Council (2003) has also noted that increases in the amount and duration of open water could make the Northwest Passage available for increased ship traffic, leading to new environmental effects caused by spills, noise, or collisions that could accumulate with effects of offshore oil and gas development. Wohlforth (2004) reported that some Barrow whaling captains are attempting to adapt to climate change by buying larger boats for fall whaling. Wohlforth noted, however, that the large boats with high-powered engines are prohibitively expensive for individuals whose cash income is derived from a few weeks of employment.

Barrow's inhabitants have historically been able to adapt to changing social and economic conditions, incorporating technologies and participating in development in the area. However, the following statement by a Barrow resident interviewed during this study suggests that the threats posed by the cumulative effects of current agents of change seem overwhelming:

> *Over the past decades, since rapid development, our whaling organizations have had a sense of mission. We are learning how to protect our way of life. There are threats in the political environment and we have learned how to look at the broader political environment in order to take care of our way of life. There are also threats I see from social change. It isn't the fact that change is happening; it is how fast it is happening. The pace is hard for anyone to adapt to. There is also the global economy that has affected the Iñupiat people and it takes time for us to adapt. It has been a difficult time for our people because of the pace of the changes happening.*

KAKTOVIK

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4.2 KAKTOVIK

4.2.1 Background and History

4.2.1.1 Background

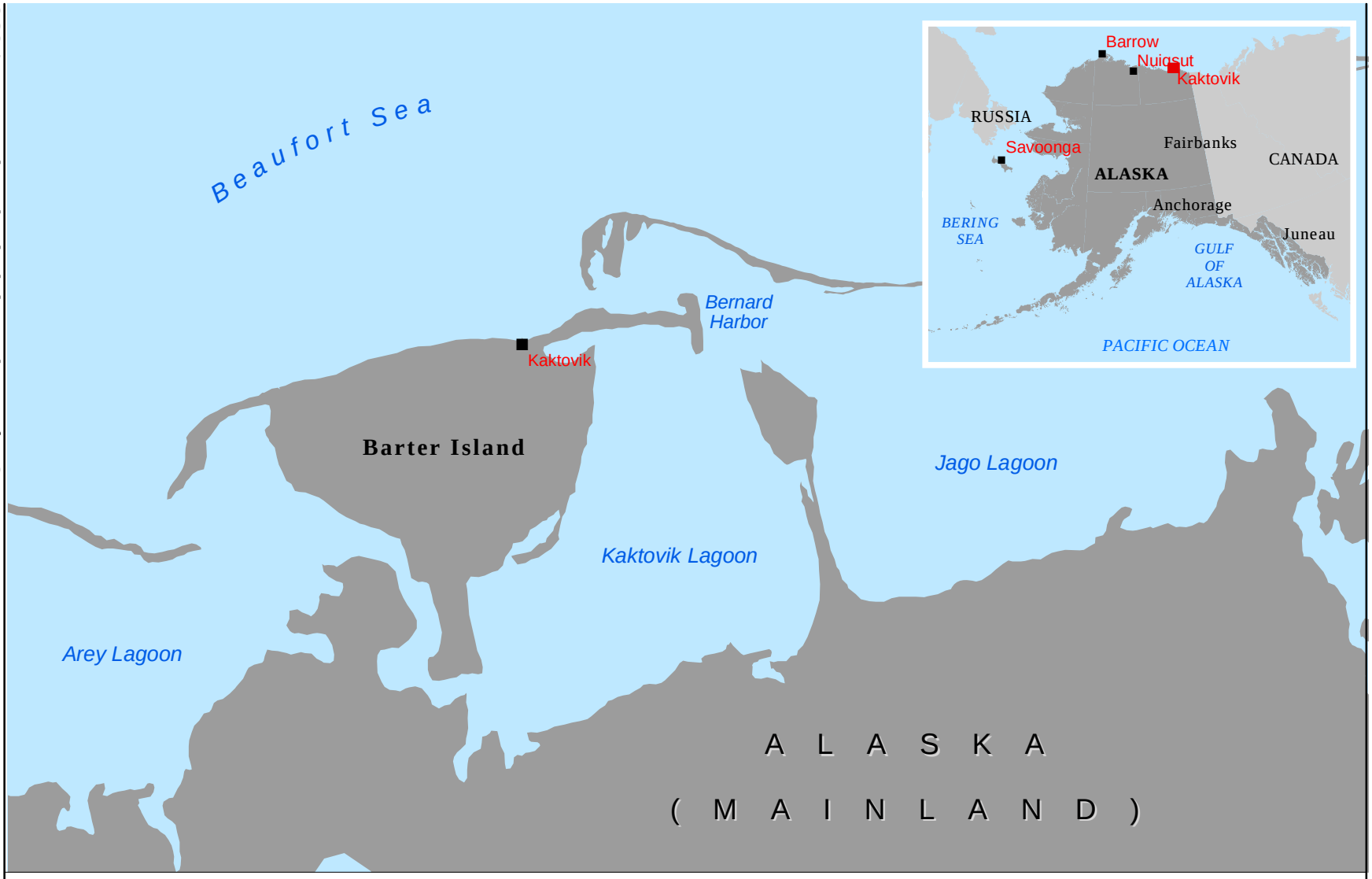
Kaktovik, also referred to as Barter Island, is a small community located on Barter Island in the extreme northeast portion of Alaska (Figures 4.2-1 and 4.2-2). The community is located within the ANWR. The 2000 U.S. Census enumerated 293 people living in Kaktovik, 247 (84%) of whom are Native. Household economies rely upon both wage labor (and other income sources) and subsistence activities as vital components of an integrated system. The major employers are the NSB, the City of Kaktovik, and the village Native corporation. There are also a few private sector jobs and businesses separate from the Native corporations. These include retail stores, a hotel, and air carrier services. However, most employment is related to government or Native corporations (IAI 1990a).

Subsistence activities in Kaktovik make use of a unique set of resources. Because of Kaktovik's location, hunters have access to terrestrial, riparian, and marine resources, and make substantial use of all three. Fish caught both in rivers and in the ocean are important resources. Caribou are the most important terrestrial subsistence resource, but sheep, musk ox, and grizzly bears are also taken. Of the marine mammals, the bowhead whale is the primary subsistence resource, but seals and polar bears are also taken (Jacobson and Wentworth 1982; IAI 1990b). Whaling takes place from the village in the fall and does not require camping. Subsistence activities, and especially activities surrounding the bowhead whale hunt, are central to the structural organization and cultural identity of Kaktovik residents.

4.2.1.2 History of Kaktovik

Before contact with Euro-Americans, the site of the present community of Kaktovik was not a permanent Iñupiaq settlement, but it had a long history as the location for seasonal gatherings for trading. Along with the surrounding area and most of the adjoining coastline, it was also used for seasonal subsistence activities of the highly mobile Iñupiaq people (Nielson 1977:1; Okakok 1981:161-173). One account of how the site came to be called "Kaktovik" (or "Qaaktugvik") also serves as an explanation for why it was not the site for a permanent village. The story relates how the Qagmaliks from the east (Canada) came to trade and decided to live in the area. They later abandoned the area after someone had killed the only son of a couple living in the area. The couple found their son's body while seining, and so the place acquired its name from that activity and became "A-Seining-Place" and those "… living in the wrong way had caused it to have no more people" (Okakok 1981:167-168; Libbey 1983:2).

In 1923, the Gordon family moved their store to Barter Island from Demarcation Point, where they had lived since 1917. (Prior to that time Tom Gordon had worked with Charles Brower in Barrow and other North Slope locations.) Apparently this move was made because Tom Gordon's wife had relatives who had taken up residence on Barter Island because of its location in relation to fishing spots and the mountains (Kaveolook 1977; Jacobson and Wentworth 1982:3). The nascent settlement also was a more viable location for the trading post, which in



Source: NOAA-2003; ESRI 2003; MMS Alaska 2006

8,000 4,000 0 8,000 Feet

Scale: 1:96,000; 1 inch = 8,000 feet

Figure 4.2-1
Kaktovik
Regional Map

Source: Google Maps 2006

Figure 4.2-2
Kaktovik
Village Map

Path: P:\2001\1K118 Bowhead Whaling\5GIS\Mxd\Village_Maps\Kaktovik_google.mxd, 01/03/07, LeeJ

turn increased the desirability of Barter Island as a place for families to live. People still lived on the land and traveled extensively, but Kaktovik had become more of a central service center than before (Jacobson and Wentworth 1982:3-4; Libbey 1983:15).

Later in the 1920s, reindeer were brought into the Barter Island area under the sponsorship of the BIA. It is reported that reindeer herding combined with hunting kept people out on the land for most of the time, although their residential focus was Barter Island. Reindeer herding was a family business, with each family having a defined herding area. Taakpaq, a famous whaling captain from Barrow (but sometimes referred to as a Kaktovik whaling captain), herded in the area between Beechey Point and Brownlow Point. Richmond Ologak herded from Brownlow Point east to the Sadlerochit River, while the Akootchooks and Tiglooks herded between the Sadlerochit and Jago rivers. Gallegher Arey and Mickey Gordon herded from the Jago River to Demarcation Bay (Libbey 1983:15). Reindeer herding in the Kaktovik area ended in the late 1930s or early 1940s (by 1937 according to Kaktovik elder Isaac Akootchook, personal communication, January 2002). A number of reasons are commonly cited. However, an assessment of the relative importance of the various factors in the Kaktovik area is hardly possible as almost all studies of Alaskan reindeer have focused on the Seward Peninsula and seldom mention North Slope operations.

Trapping also supported a dispersed population, and trappers tended to focus on a supply center where furs could be traded for consumer goods of various sorts. In addition to the trading post on Barter Island run by Tom Gordon, other trading posts were operated by Jack Smith at Beechey Point, Henry Chamberlain at Brownlow Point, John Olson at Imaignauraq, Old Man Store at Demarcation Bay, and others as well. These trading posts tended to change locations (and proprietors) depending on the productivity of the trapping territory surrounding them. The decline of the fur market in the mid-1930s caused many of these trading posts to close, and other traders died (Tom Gordon died in 1938, John Olson in 1942) or simply moved elsewhere. The result was that, by the 1930s and 1940s, there were few trading posts left and people once again dispersed—some to Canada (the Mackenzie River area, where a trading post remained open), Barrow, or other places. A core population remained in the area, maintaining a mobile subsistence lifestyle (Libbey 1983:16-18).

In the mid-1940s the U.S. Coast and Geodetic Survey began mapping the Beaufort Sea coast, with their main base camp on Tigvariak Island, 85 miles west of Kaktovik. Several relatives of present-day Kaktovik residents worked on this project and spent time at Tigvariak Island. In 1947, the U.S. Air Force began construction of the airstrip and hangar facility at Kaktovik, forcing the relocation of some Kaktovik residents and disturbing a significant prehistoric village site. In 1951, the entire area around Kaktovik was designated a military reserve, and again some Kaktovik residents had to relocate (Nielson 1977; Jacobson and Wentworth 1982). A DEW Line station was constructed there in 1952-1953 as a prototype/test facility for the other proposed stations of the DEW Line System (Denfeld 1994:190-192). A BIA school was opened in Kaktovik in 1951. The combination of the school and the availability of local wage employment supported a population influx. The population stabilized at approximately 140 people and remained at about this level until the 1970s. However, the population increased after the establishment of the NSB, which resulted in more local employment opportunities, and an increased and improved housing supply (Jacobson and Wentworth 1982:5).

The period of time since the establishment of the NSB has been one of increased economic stability in Kaktovik, in terms of wage employment, and a modification of the schedule of subsistence activities to accommodate steady wage employment. This is not a static system, however, and there is uncertainty whether an equilibrium has been reached or whether wage labor as a scheduling force will remain as important as it is at present. At the time of fieldwork (2004) there were few active subsistence specialists in Kaktovik who did not also work for wages. That is, few people support themselves solely by hunting and by sharing the game they procure for other goods that they cannot harvest. Most hunters participate directly in the wage economy, and some wage laborers do little or no hunting.

4.2.2 Community Characterization

Basic demographic information for Kaktovik has been presented in Chapter 3 for the year 2000. Overall population was 293, with 75% identifying themselves as Alaska Natives and another 9% as Alaska Native in combination with at least one other "race." Males composed 53% of the population, and females correspondingly 47%. The median age was 32.1 years. Fully 39% of the population was under the age of 20, while only 7.5% was age 65 or greater (16% if the threshold is age 55). Clearly Kaktovik's population was predominately Iñupiat but is demographically older than the other three study communities and close to the demographic composition of the state as a whole. Kaktovik has a greater gender imbalance of males over females than Savoonga or Barrow, but not nearly as great as that of Nuiqsut. Of the four study communities, Kaktovik has the oldest median age. Less of Kaktovik's population is under the age of 20, and more of its population is over 65 (or even 55), than in any of the other communities. Kaktovik is between Barrow and Nuiqsut (and equal to Savoonga) in terms of the percentage of its population aged 20 to 64.

There were 95 housing units in Kaktovik in 2000, with 89 of them occupied. Of the 95 units, 83 were single-family structures and most (48) were owner-occupied. Much of this housing has been built since 1973, increasingly with local labor in conjunction with non-local specialists, but some older structures remain in use. All structures receive electricity from the NSB-operated power plant. While most structures lacked complete plumbing in 2000 due to a lack of running water, most are now connected to the recently completed water and sewer system and now have running water and flush toilets. A few units still rely on delivered water and holding tanks or "honey buckets" to dispose of human waste. Phone service is available to all households, although not all subscribe to the service (18.2% of households lacked phone service in 2000). All but about 5% use fuel oil (diesel) for heat. Water is provided by a nearby freshwater lake and is treated in a state-of the-art water plant. Sewage is treated in a new sewage treatment facility. Plate A displays some photos of different aspects of the community.

Other infrastructure present in the community includes the "standard" set for which the NSB has responsibility as well some for which there is more local responsibility. NSB infrastructure and non-NSB infrastructure, as shown in Table 4-3, are an impressive array of facilities and infrastructure equivalent to those expected of "typical" American communities and superior to those of many other rural communities despite Kaktovik's size. Plate B provides examples, along with Table 4-3, of the infrastructure found in Kaktovik.

Table 4-3. Infrastructure Found in the Village of Kaktovik

NSB Infrastructure	Non-NSB Infrastructure
• Power plant • Water treatment facility and large water storage tanks • Sewage treatment facility • Water and sewage system (running water and flush toilets) • A large, modern school (kindergarten through high school) • Large, two-bay fire station with meeting room • Large, two-bay Department of Municipal Services building (Public Works) with a full array of tools and parts in storage • Some other buildings, mostly converted from other uses, used for various kinds of storage • Police station with holding facilities and officer housing (officers are now itinerant and rotating rather than resident) • Health clinic with housing (nurse's aides and physician assistants are itinerant, as are other health services provided on a regular but less frequent schedule—dentist, eyecare, veterinary, and so on) • NSB Housing Maintenance facilities, with an office, tools, parts storage, and a work area (although most work is done on-site) • Search and Rescue building, with communications and other equipment (snow machines, survival gear, and so on) • Some former DEW Line buildings transferred to the NSB (and other public) ownership when they were decommissioned by the U.S. Air Force. • Village coordinator's facilities and Teleconference Center • Teacher housing (rental units)	• Community Center (City offices, a large public use area, and offices available for rent) • Native Village of Kaktovik offices (former U.S. Fish and Wildlife Service [USFWS] office building for ANWR) • Two small to moderate-size grocery stores, one owned and operated privately and the other by the village corporation (Kaktovik Iñupiat Corporation [KIC]) • Two hotel/camp operations, one owned and operated privately and the other by the village corporation (KIC) • KIC office building, with space available for rental to other commercial operations • KIC hardware store, in a recycled older building • One or more other KIC/NSB buildings and/or storage yards, vacant or in use by co-venture partners • U.S. Post Office • Airstrip with runway lights and wind sock • Tank farm for oil and gas station • Earth station array for telephone connections • USFWS bunkhouse and seasonal office for ANWR

Community Characteristics

Native Village of Kaktovik office

Presbyterian Church

Packing for a trip

Local DEW Line site

Kaktovik - Plate A

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Infrastructure

Power plant

Kaktovik Health Clinic

Kaktovik Fire Station

Harold Kaveolook School

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4.2.2.1 Employment

Infrastructure (in the village, and the services it supports) requires an employed labor force, and most full-time employment in Kaktovik is a result of this infrastructure and services (mainly NSB, Kaktovik Iñupiat Corporation (KIC), or City of Kaktovik. A few individuals may work full-time in the oil and gas industry, but the relative difficulty of travel to and from the oil fields compared to Nuiqsut and even Barrow minimizes these opportunities. The only other significant sources of employment are seasonal projects for the construction or maintenance of other infrastructure, temporary positions as part of the NSB mayor's job program, and very recent support positions for offshore oil and gas exploration activities. Seasonal employment is of great importance in Kaktovik. Although the unemployment rate can be quite high at times, seasonal employment provides opportunities for most, if not all, aspiring workers to find a job. Some people prefer seasonal work, as it allows them to more easily participate in the full range of subsistence activities. The "typical" Kaktovik resident probably defines his or her lifestyle more in terms of subsistence activities and the subsistence annual cycle than in terms of employment for wages or consumer goods (discussed in Section 4.2.4). Plate C illustrates some locations of employment in the community.

4.2.3 Oil Development and Proximity to Village

For most of the North Slope communities, oil development since 1969 has had a general, indirect influence based on the increasing level of NSB services supported by the local taxation of oil facilities rather than a direct impact on the community itself. Oil and gas development as such has had little direct effect on Kaktovik—no such development has occurred near Kaktovik. BP's Badami development, approximately 35 miles west of Kaktovik and west of ANWR, is the closest oil development to Kaktovik. The Point Thomson unit, on the western boundary of ANWR, is even closer to Kaktovik, although there are no near-term prospects for its development.

An aspect of potential North Slope petroleum development more directly important to Kaktovik is the issue of exploration and development within ANWR. The only exploration work within ANWR was a private seismic survey of the coastal area in 1984-1985 and a single exploration well drilled on KIC land by Chevron and BP in 1985-1986 (Boyd 2003). Congressional approval is required before further oil and gas exploration and development can occur. In the past, most Kaktovik residents have expressed support for the exploration and potential development of oil and gas within ANWR. The City of Kaktovik conducted a survey that found approximately 70 to 80% of local residents favored onshore oil and gas development (City of Kaktovik 2000). More recently, however, a local resident gathered 63 Kaktovik signatures on a petition opposing development in ANWR (ADN 2005a, 2005b). While the petition results are not necessarily inconsistent with the earlier survey, given that there are over 200 adults in Kaktovik, the petition itself may represent a shift in sentiment on the issue (Arnold 2005).

Interest in offshore exploration on U.S. and Canadian OCS land has increased significantly in the last several years and is projected to continue (Bailey 2006a, 2006b, 2006c). While this activity has historically been and will continue to be concentrated in the mid-Beaufort Sea area most critical to Nuiqsut residents, it is planned to extend throughout the Chukchi and Beaufort seas,

including Canadian waters east of Kaktovik. Figure 4.2-3 illustrates the proximity of oil and gas leases and the Beaufort Sea program area in relation to Kaktovik. As will be discussed later, information collected during this study indicates that Kaktovik residents are very much opposed to offshore oil and gas development.

4.2.4 Subsistence and Cash Economy

4.2.4.1 Employment/Labor

The aforementioned infrastructure (and the services it supports) requires an employed labor force, and most full-time employment in Kaktovik is a result of this infrastructure and services. A few individuals work full-time in the oil and gas industry. The only other significant sources of employment are seasonal projects for the construction or maintenance of other infrastructure, temporary positions as part of the NSB mayor's job program, and some self-employment. Seasonal employment is of great importance in Kaktovik. Although the unemployment rate can be quite high at times, seasonal employment provides opportunities for most, if not all, aspiring workers to find a job. Some people prefer seasonal work, as it allows them to more easily participate in the full range of subsistence activities. The "typical" Kaktovik resident probably defines his or her lifestyle more in terms of subsistence activities and the subsistence annual cycle than in terms of employment for wages or consumer goods.

Of the 293 residents of Kaktovik (in 2000), 190 (65%) were part of the potential labor force (ages 16+). The actual labor force (employed plus those seeking work) numbered 138, or 73% of the potential labor force. This is fairly high for a rural Alaskan community, since in many rural communities employment opportunities are so few that many adults do not often actively seek work. Formal unemployment was 15% (21 individuals of the labor force of 190) while 38% of the potential labor force was not working ("unemployed" plus those not seeking work). Wage opportunities are available in Kaktovik for both men and women, although the average male employee probably earns more than the average female employee.

Seasonal work is quite important in Kaktovik. While some residents prefer the security of permanent employment, others prefer seasonal employment, which is more compatible with more extensive subsistence activities. Permanent full-time employees confine their subsistence activities primarily to the weekends, vacations, and short trips after work. This works well for the summer, with long days, but less well for seasons with shorter daylight hours. Since most of the seasonal work takes place either in the summer (construction of infrastructure and housing) or the winter (ice road construction and maintenance) when outdoor subsistence activities are at a minimum, seasonal employees have much more flexibility in conducting subsistence activities.

Other categories of employees fall in between these groups in terms of how easily they articulate with subsistence activities. Part-time employees generally earn less but have a reasonable ability to engage in subsistence activities. Temporary full-time employees, such as for the mayor's job program positions, tend to forego subsistence activities, except for short trips after work, while employed. Such positions tend to have a term of about 13 weeks, however, so this is a short-term tradeoff. Those individuals who explicitly make the decision not to seek permanent employment would not be considered part of the labor force unless they were actually employed at the time of

Labor and Wage Economy

Waldo Arms Hotel provides seasonal employment as a small business

Kaktovik Iñupiat Corporation Hotel

Gas station

Public works building

Kaktovik - Plate C

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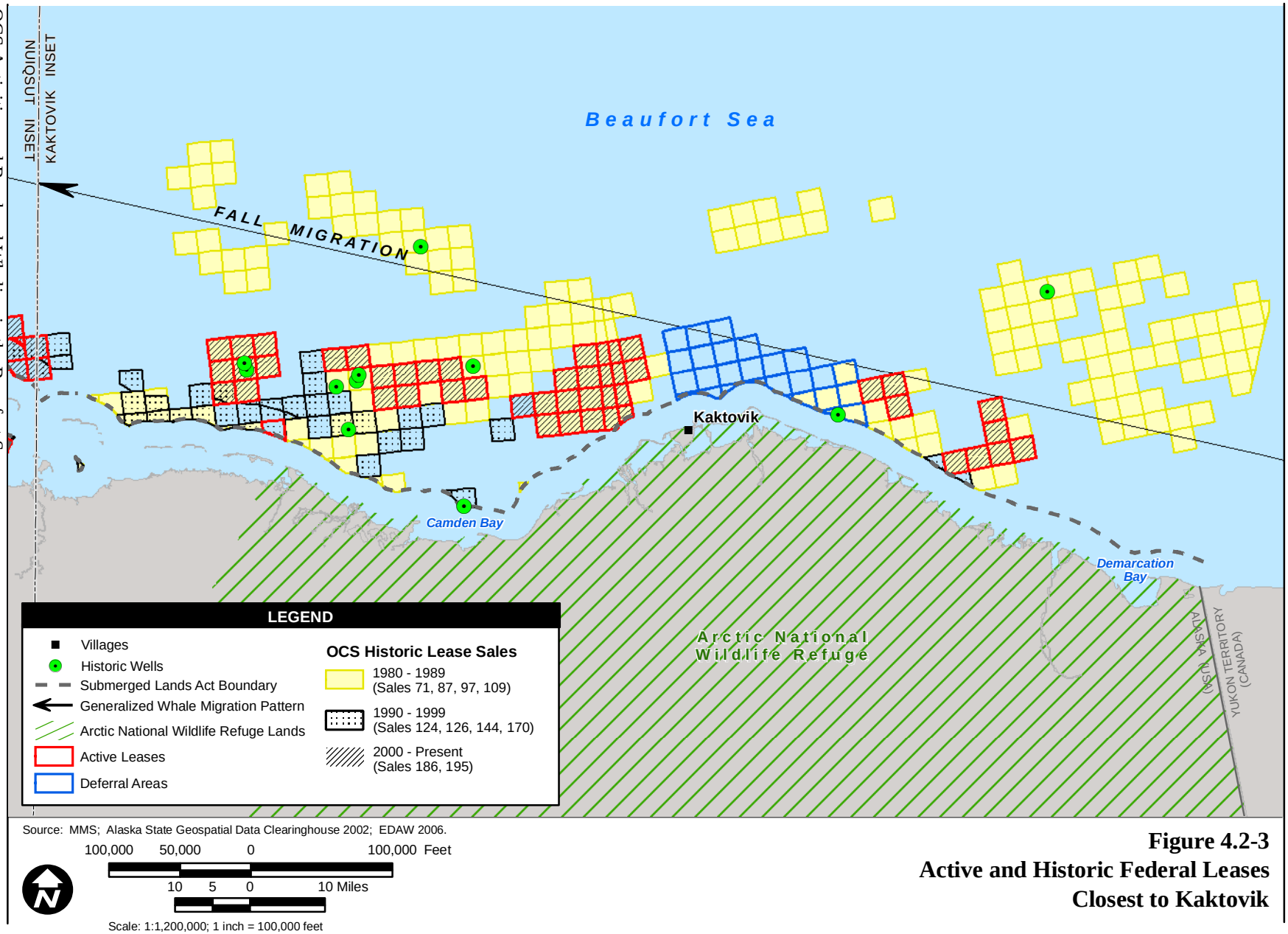

Figure 4.2-3
Active and Historic Federal Leases Closest to Kaktovik

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the census. However, the seasonal pattern of employment has been very stable in Kaktovik for the recent past, as a combination of NSB (and other local) construction projects and oil development and/or research-related projects. Those Kaktovik residents with permanent jobs will take time off from work for subsistence activities requiring larger blocks of time than others—whaling, fishing, hunting birds, and hunting sheep. The first can sometimes be accommodated on a day-by-day basis, given the large crew sizes in Kaktovik and the ability to whale from the village as a logistical base. The other three activities require travel away from the community and usually camping. Sheep hunting is a specialized activity for a relatively few hunters, while fishing and birding are much more general activities.

Per capita income in Kaktovik for 2000 was $22,031. Median household income was $55,625 and 6.6% of the population was below the formal poverty level. Sources of income other than wage employment would include:

- Self-employment. There are a number of business licenses issued to Kaktovik enterprises, with several related to KIC (including a hotel, a store, and others). More are related to the private retail, lodging, and flight/guide services available in Kaktovik. There is a privately owned store in Kaktovik, a privately owned hotel/camp with several associated businesses, and several other relatively inactive businesses. Some people also manufacture traditional knives (ulu) for sale or barter, and others engage in various other craft activities.
- Transfer payments of various sorts, such as foodstamps; Women, Infants, & Children (WIC) benefits; unemployment benefits; Social Security benefits; Supplemental Security Income benefits; child support payments; and so on.
- Other retirement benefits.
- Dividend payments from village and regional Native corporations, and the State of Alaska Permanent Fund Dividend.

The main employers are the NSB and Native corporations, often in conjunction with each other. Native corporations also frequently co-venture with private firms on local (and some non-local) projects. KIC also operates the local "hotel," which functions mainly as a camp for the labor force for NSB and other local projects, and traveling NSB staff. This facility is nearly always full and provides some local employment for housekeeping and other staff needs (but management and food preparation are contracted out). The "private" hotel more often has vacancies and provides less local employment.

Wage labor and income are not related to participation in subsistence activities in a simple way, but certain generalizations are fairly clear. Those Kaktovik residents with greater incomes have greater access to the equipment and supplies that facilitate subsistence activities, although not all such people necessarily are among the most active subsistence harvesters in the village. They may in turn help support those active hunters who do go out and harvest the resources. Snowmobiles, boats, outboard motors, rifles, ammunition, gas, and so on are expensive but necessary for successful harvest, and they serve to at least partially counterbalance the time "lost" for subsistence activities due to the need to work to buy them and the other necessities of life in present-day Kaktovik. At the same time, those without large incomes can nevertheless

participate in subsistence activities, and especially activities that do not require as many cash inputs as others—fishing or sealing near the village, for instance. Those without equipment can often find a boat "to jump on" or otherwise borrow equipment to go out, as long as they share the harvest. Whaling is perhaps the most extreme example of this, where the whaling captain is at least normatively expected to provide everything necessary for his crew to go out whaling. In Kaktovik not all whaling captains had well-paying employment. All whaling captains had a wide-ranging support network of relatives who provided support for the crew, however, and commonly at least one wage earner would be among them. This topic will be discussed at greater length below, as different captains and crews deal with the need for cash in different ways, but access to cash resources has become one of the hurdles to fielding a whaling crew.

4.2.4.2 Subsistence Culture and Community

Estimates of subsistence resource harvest and use are at best rough measures, but the Alaska Department of Fish and Game (ADF&G) estimates (based on three surveys for different years) that the approximate per capita consumption of subsistence food for Kaktovik is 886 pounds. Marine mammals (primarily bowhead whale but also seals of various sorts, beluga, and other species) contribute up to 68% of total harvest and consumption in a "representative" year. In years when fewer whales (or smaller whales) are taken, the percentage is of course lower and the use of other resources is increased. Fish (mainly freshwater white fish) typically contribute 13% of the total while terrestrial mammals (primarily caribou and sheep, as Kaktovik hunters do not hunt moose much and musk ox hunting is still relatively restricted) contribute 17%. Other resources are also harvested and can be seasonally quite important (furbearers, birds, etc.) and typically contribute 2% of the total. The timing of the harvest of these resources may make them more important than the 2% total may imply. It must be stressed that there is no "average" year so that in some years one of the resource components may comprise much more than is "typical" of the actual total subsistence resource use (especially in years when few or no whales are taken).

A description of the current subsistence cycle based on Impact Assessment Incorporated (1990c) and interviews with Kaktovik hunters conducted in the course of this study is provided in Table 4-4. This table is graphically displayed in the Kaktovik subsistence hunting calendar (Figure 4.2-4).

4.2.4.3 Patterns of Change and Contemporary Issues

The formation of a modern settlement and the development of local full-time wage employment are having significant and long-range effects on the subsistence pattern in Kaktovik. Community residents interviewed during this study noted that they are engaging in a wider variety of activities and have a wider range of responsibilities than they did in the past, which places constraints on subsistence activity patterns. People travel much more, farther away, and for more reasons, than in the past. Winter subsistence activity is minimal, except for a few very active hunters. Hunting trips tend to be shorter than in the past, with day trips being most common. Longer trips are increasingly taking on aspects of recreation as they most often have to be scheduled to coincide with annual leave and are often used to hunt "special" species such as sheep or whale.

Table 4-4. Kaktovik Subsistence Cycle

Subsistence Resource	Current Hunting/Harvesting Pattern
Whales	Changes in weather patterns, the need or desire to accommodate employment opportunities, and the availability of whales have changed hunting patterns. Fall whaling occurs early September to mid- or late-September (with an occasional harvest in October). A limited number of Kaktovik whalers may whale in the spring as well as in the fall, but do so in other villages.
Seal	The peak seal hunting documented by Hoffman et al. 1988 during the whaling season has in recent years not been evident. Kaktovik whalers have concentrated on whaling during this period, to the exclusion of the harvest of almost any other resource. This need not be as exclusive a focus as for Nuiqsut, since on days when whaling cannot take place Kaktovik hunters could still go out for seal or caribou since their logistical base is the village. Hunters will go out for seals throughout the year, when conditions are appropriate.
Walrus	Kaktovik hunters only harvest walrus when visiting communities where they are available (mainly Barrow in June-August).
Polar bear	While polar bear are available almost any time ice is present, Kaktovik hunters in the recent past have taken them mainly during whaling. The whales taken and butchered attract many polar bears. Also, it is often necessary to haze, and sometimes to kill, bears to maintain the safety of the whaling crews and community members. Few bears other than "nuisance" bears are taken. Since 1980, 2 to 10 bears have been taken each year.
Birds/eggs	Most of the harvest occurs when ducks and geese are migrating. To accommodate wage employment, effort and harvest tend to be much more concentrated in bimodal peaks. One peak will be in the spring, and another in the fall. Ptarmigan are especially hunted in March, when they are still aggregated in flocks and are one of the few sources of fresh meat available.
Caribou	Kaktovik's annual caribou harvest fluctuates widely because of the unpredictable movements of the Porcupine and Central Arctic herds, weather-dependent hunting technology, and ice conditions. Caribou can be hunted year-round, but there are times of the year when they are only hunted if there is an immediate need for meat. The limited information available indicates that over half of the caribou harvested by Kaktovik hunters are taken in the ice-free "summer" period of June through September. All of these animals are taken at or near coastal sites. Since a significant number of "winter" harvested caribou are taken at these same sites, well over half of all harvested caribou have been historically taken at coastal sites (Pedersen et al. 1985; Pedersen 1990; and more generally, Wentworth 1979:99).

Subsistence Resource	Current Hunting/Harvesting Pattern
Moose	Few Kaktovik hunters hunt moose unless no other options are available. This may be related to the historic closure of the moose hunt in the area due to low moose populations, the short season when it was reopened, and the present small seasonal village quota of three. The current season is July through March. The long season is an indication that relatively few hunters engage in this hunt.
Grizzly bear	The occasional brown bear that may be taken is shot on an opportunistic basis and is not the object of a focused hunt.
Furbearers	Few, if any, Kaktovik residents continue to trap. Hunters still avidly pursue wolf and wolverine, however, by searching extensive areas for them and shooting them. Pelts are said to be best in the middle of winter, but this is also when conditions for hunting are the worst. Hunting furbearers can be more extemporaneous than trapping and does not require as large a block of time or as rigid a schedule as does trapping. For the most part, Kaktovik hunters only plan a trip for furbearers after they have laid in a reasonable store of meat. Once this is done, they can afford the relative luxury of hunting for fur. Most informants report that the best time to hunt wolf and wolverine is in March and April, when the days start to get longer and the temperature begins to moderate. Conditions continue to be good through April, but after that the pelts start to bleach as the days continue to get longer. Thus most furbearer hunting activity is in March and April.
Sheep	Because Kaktovik Iñupiat hunt sheep using snow machines for transportation, the harvest period is usually late October through November, and March through April. Kaktovik hunters much prefer the condition of the animals in the fall, when they have more fat and prior to the rut.
Freshwater fish	People fish at fish camp and while engaged in other activities that require camping on the land. Fishing can take place year-round, but summer fishing with gill nets (of various mesh size) is the most productive of the year and most of the fishing effort is directed to this activity. Jigging is done through a hole chopped in the ice, generally with an unbaited lure on the end of a stout line. Winter/spring ice fishing at inland sites is combined with sheep and caribou hunting, especially if family units camp out for any period of time for these activities.
Ocean fish	Kaktovik residents may set nets in the ocean when traveling the coast in summer, but this is not reported to be a primary activity. The overall harvest is small. Some households also set nets near the village.
Musk ox	Hunting opened near Kaktovik in 1990 and near Nuiqsut in 1995. This is a limited permit hunt essentially open to hunters of Kaktovik only in the Kaktovik area. The preferred time is before whaling (by boat) or after whaling (by boat or snow machine).

However, subsistence will always be much more than recreation to Kaktovik residents, as long as culturally central values are retained. Interviewees noted that when they get tense or frustrated in their daily lives, it helps to "go out on the land." This clears the head and relaxes them, and if they do take an animal, the trip also provides some meat for their household or the village. In short, aspects of the hunt other than the actual harvest are becoming increasingly important as cultural identity value markers and for the maintenance of mental health, especially as the time available for subsistence activities becomes less.

4.2.5 Community and Whaling

This introductory section will begin with a discussion of evidence for aboriginal whaling in the Kaktovik area, and a brief account of historical whaling in the area. A general description of contemporary whaling in Kaktovik follows, with more specific information discussed in later sections.

4.2.5.1 Aboriginal and Historical Whaling in the Kaktovik Area

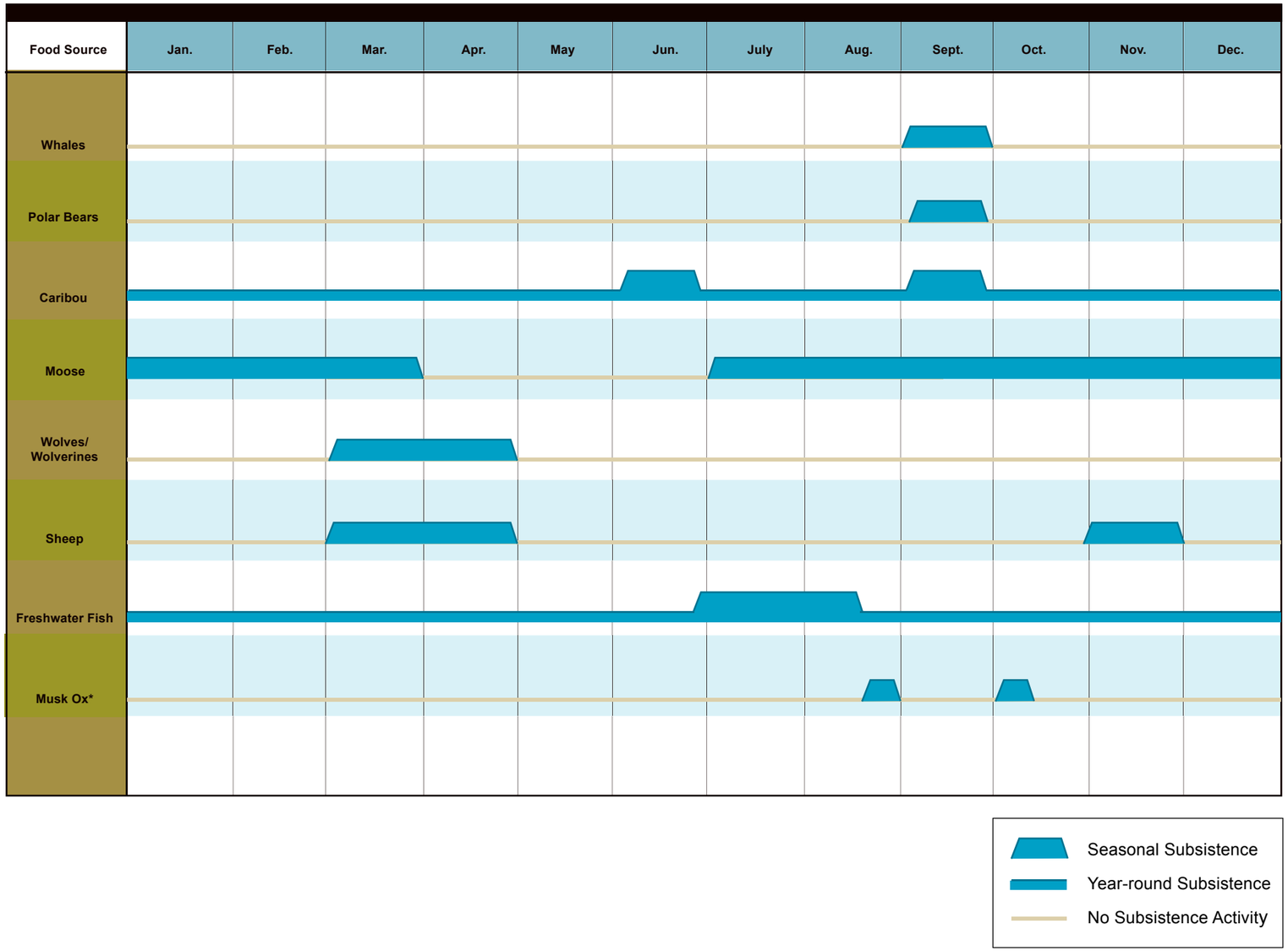
Definitive information on the antiquity of whaling in the regions of the Alaskan North Slope east of Barrow does not really exist, although evidence for such activity at least in the late Thule period (starting about 900 years Before Present [B.P.]) is generally accepted. Informants maintain that whaling took place at Barter Island in aboriginal times (Okakok 1981:170-173). While Hall (1987) and Hall and Associates (n.d.) could perhaps provide more site-specific information in this regard, access to those sources is restricted and Hall's more accessible publications do not suggest that whaling occurred there in aboriginal times. No fully documented and dated excavation at Barter Island itself has taken place, but prehistoric features with whale bone suggest a whaling tradition (Jacobson and Wentworth 1982). It is likely that the prehistoric sites excavated by Diamond Jenness in 1914 have either eroded away or were destroyed when the airstrip was built (Wescott et al. 2000), although it is possible that remnants remain (Yarborough 2001).

In a summary publication, Hall (1981:48) states that the available archaeological evidence from other sites along the Alaskan north coast east of Barrow provides only the most meager cultural history:

> *Essentially, there is no unequivocal evidence of occupation in the area previous to 4,000 years ago, precious little data on the nature of human adaptation in Arctic Small Tool tradition times, and only enough information from the more recent sites to broadly outline a picture of human occupation in the past 600 years* [the late prehistoric].

For the late prehistoric period, approximately 1350 to present, there are only three well-documented archaeological sites east of Barrow, all within or near the Colville delta 155 miles west of Kaktovik: (1) Nigalik is a specialized activity site in the Colville River delta. The lack of systematic archaeological testing at this site has resulted in an inability to establish prehistoric roots for the Native seasonal trade fair at Nigalik. Little has been recovered at this site that would address the subsistence behavior of the people using the site. (2) Thetis Island, just northeast of

Kaktovik Subsistence Time-line



NOTES:

*** Musk Ox**
The hunting for musk ox occurs on the way to and from whaling.

This chart is a graphical representation of an idealized annual subsistence activities calendar. It is intended to portray seasons of greater or lesser subsistence activity related to particular species or species groups, but it does not attempt to show varying levels of effort within active seasons or compare levels of effort across different species or activities.

Sources: Galginaitis et al. 2001
Ethnographic Field Notes 2004
ADF&G Community Profile Database

Figure 4.2-4
Subsistence Hunting Calendar for Kaktovik

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the Colville delta, has prehistoric remains dated to A.D. 1350-1500. There is evidence of whaling activity, but both the nature of the tools and faunal remains found there support a subsistence pattern oriented primarily toward caribou (50%) and seal (25%), with the remainder representing birds, foxes, whales, and various small animals (25%, in that order). Thus, whales must have been an infrequent catch, given their large size relative to the other resources being harvested. (3) Pingok Island, near Thetis Island, has prehistoric remains dated to A.D. 1550-1700. Land subsistence activities are well represented in this archaeological assemblage as well, but seals and whales are also common. The bearded seal and walrus are not well represented, but overall it appears that whaling was a significant activity at Pingok Island during this period. A site at Herschel Island, in the Canadian Beaufort, dates to the late Thule period, about 900 years B.P. (Stanford 1976).

However, the interpretation of this information in terms of cultural history is far from clear (Hall 1981:4-49, 71-73). Sites on Barter Island and Arey Island display whale bone but have not been dated with any precision. Arey Island is named for Ned Arey, a commercial whaler, and the Iñupiaq name, Naalagiagvik, means "Where you go to listen for whales" (Libbey 1983:46-48). Arey Island is often mentioned by Kaktovik residents as a location where whales feed and linger. Diamond Jenness excavated these sites in 1914 but never published the results (Jenness 1914). Jenness did write some non-analytical accounts of this work (D. Jenness 1957; S. Jenness 1991), but for the most part these describe day-to-day activities rather than scientific findings. Edwin Hall performed an analysis of the artifacts and field notes from the Jenness excavations and concluded "… most of the features were built and utilized between 550 and 400 years ago, although a few of the recovered artifacts dated to a much earlier period and others indicated use of the sites up through the historic period. … The types of artifacts found suggest a subsistence quest that emphasized land hunting as much as or more than marine hunting. Whaling was practiced by at least some of the families that occupied the sites, though when in the occupational sequence is not known. Fishing also played a role in the subsistence efforts of some families" (Hall 1987:258-259).

Commercial whaling ships first appeared at Barter Island in 1886 and reached the Mackenzie Delta whaling grounds in 1888. By 1894, fifteen ships were spending the winter at Herschel Island, attracting Native hunters to supply them from as far away as Point Hope (Bockstoce 1986; Wilson 1991). How much time these ships spent in the eastern Alaskan Beaufort Sea is not clear, but ships logs and accounts may contain observations of whale behavior in that area from that time. Such archival research was not a component of this project.

Cross Island and other mid-Beaufort Sea locations have been sites of whaling activities for hundreds of years, dating back at least to the late prehistoric period. Taaqpak, a whaling captain, whaled at Cross Island from the 1920s to 1940 (Carnahan 1979:25-31). Taaqpak was one of several Iñupiat who bought boats from Euro-American whalers or traders in the 1920s. It is not clear if Taaqpak ever lived in Kaktovik or had that community as his center of orientation, but many of those who served on his crew did. Many of the people now whaling in Kaktovik received their training while whaling in the Cross Island area with Taaqpak (or with someone who had learned from such a person). Thus, although whaling in the immediate Kaktovik area is not documented prior to 1964, Kaktovik people certainly have a long and continuous history and tradition of whaling (Jacobson and Wentworth 1982:52-53), directly related to that of Barrow and the mid-Beaufort Sea area.

It is not altogether clear why whaling was suspended in the mid-Beaufort area west of Kaktovik, but primary factors were probably economic and demographic dynamics (which were also important for the community history of Kaktovik). The decline of the reindeer industry may have prompted most of the people who had been in the general mid-Beaufort Sea area to relocate to Barrow or Kaktovik. The mid-Beaufort Sea and Colville River areas, and those farther east, were experiencing depopulation at this time. Schools and wage labor jobs were serving to attract people off the land and into central communities.

4.2.5.2 Contemporary Kaktovikmiut Whaling

Whaling resumed at Kaktovik in 1964 (Kaleak 1996) and since then has been a central focus of life in Kaktovik. The immediate reasons for the resumption of whaling in 1964 are not clear, but the community had been growing, whales had been observed regularly, and some residents had experience from whaling elsewhere. Information for some years soon after 1964 is not complete, but whaling has taken place out of Kaktovik during most years since then, with a high degree of success—especially since 1989 (see Table 3-5). According to the available whale landing data, one to three bowheads were landed during most years in the 1980s, and two to four bowheads during most years in the 1990s and 2000s. Years when the quota was not filled were generally those reported as bad weather/ice years and/or years when industrial activities were taking place in the area during the whaling season.

People from Kaktovik hunt whales only in the fall, as the spring migration of bowheads past Kaktovik occurs far offshore beyond the landfast ice zone. The autumn whaling season starts no sooner than late August, though most commonly near Labor Day in early September, and ends later in September or sometimes October. At Kaktovik, whaling is done from powerboats. These boats can vary widely in characteristics, from an 18-foot open Lund skiff to a 24- or 25-foot cabin-cruiser type vessel. As speed is a much desired characteristic, motor size has tended to increase through time. Depending on the year, there are up to 11 whaling crews in Kaktovik. Typically, four or five men will go out in each whaling boat, so that most adult men are involved with whaling. Traditionally, women did not go out in whaling boats (except in very unusual circumstances), but this behavioral norm has been relaxed or modified so that sometimes a female crew member may go out looking for whales. Women are very much members of the whaling crew, however, and most people in the village are involved at least in some support or processing capability. Whaling is truly a community-wide activity.

Whaling crews use the village as their home base, leaving from the village and returning to it every day. As described by one informant, a crew leaves Kaktovik, cruises in search of whales, and then ties up to a piece of ice. Eventually a number of boats will congregate and the crews will set out their provisions, eat, and socialize while a few of their number watch for whales. There are some years when there is little or no ice, in which case the boats cruise at slow speeds while looking for whales. Even when there is significant floating ice cover, the whalers will spend much time cruising the open water and searching for whales. Coordination between boats may be more difficult in years when there is more ice, and especially fog, although CB and marine VHF radios plus GPS units have made this easier in recent years.

When whales are spotted, the boats are arranged to intercept them in such a way that at least one should be in a good position to strike it with a darting gun. There is some competition to be the first to strike a whale, as this increases the prestige of that captain and his crew, but the process as described is mainly cooperative. Once a whale is struck, all crews in the area go to help procure the whale, tow it back to Kaktovik, and process it. In recent years, heavy equipment has been used to haul the whales onto the beach for butchering, as well as to shift the whale during the process of butchering. The heavy equipment is also used for transporting the butchered maktak and meat (which are placed directly into the equipment's buckets) and for the ultimate removal of the whale carcass. A similar method has been adopted for the butchering of fall-harvested whales in Barrow (and by Nuiqsut whalers on Cross Island) and is one of a series of adaptations that make the butchering of a large and heavy animal on a gravel beach easier, faster, and more efficient than more "traditional" methods.

The "core" whaling area for Kaktovik is from the Okpilak and Hulahula rivers in the west to Tapkaurak Point in the east. The core whaling area extends out as far as 20 miles from the coast, although crews usually stay within 12 miles or so of shore. Nearly all whales harvested since 1964 have been struck within this "core" area and there is an explicit effort to stay within this range. This "core" area does not represent the only area critical to the success of Kaktovik whalers. It is merely the area within which they find and strike most of the whales that they harvest.

Towing a whale is hard work and relatively slow, especially if there is a wind or rough seas to contend with. The farther away from Kaktovik a whale is taken, the longer the tow will be, and the greater the chance that at least part of the meat will spoil. The extreme limits of the "Kaktovik whaling area"—the middle of Camden Bay in the west and just north of the Kogotpak River in the east—are as far as Kaktovik whalers can conceive of trying to tow a whale back to Kaktovik. As previously stated, most whales are taken within the smaller "core" area, and within that area most of the whales are in fact struck close to the village.

Crews could function with as few as three people in the boat, but most crews have four or five, and some claim as many as eight. Not all days are equally good for whaling, and there are periods when crews do not go out because of wind, waves, or large amounts of sea ice. Because of the quota system that has applied since 1978, the season is over once the allocated number of strikes is used. Kaktovik currently has a quota of three strikes or takes but is often in a position to request additional strikes since it is common for spring whaling communities not to use their entire quota. However, since 1997 the Kaktovik hunters have not requested that unused strikes from other communities be transferred to Kaktovik. The prevailing local opinion is that three whales are adequate to meet Kaktovik's needs.

Kaktovik has what is essentially an intercommunity agreement with Anaktuvuk Pass under which Kaktovik maktak and whale meat are sent to Anaktuvuk Pass and caribou is sent from Anaktuvuk Pass to Kaktovik. This is not trade in the strict sense, as in years when Kaktovik does not harvest a whale they still receive caribou from Anaktuvuk Pass and may indeed receive more caribou in those years than in years when they do harvest a whale because of the greater nutritional need. Most of the food thus exchanged is redistributed at public functions and feasts, primarily at major holidays such as Thanksgiving, Christmas, Easter, and the Fourth of July.

Whaling is a cooperative activity and as such the Kaktovik whaling area is open to all who wish to participate in the hunt, as long as each person belongs to a crew whose captain is a member of the Kaktovik Whaling Captains Association (KWCA). The KWCA has explicit rules to regulate the hunt that also serve to increase safety for the whalers and decrease the chances of losing a whale. No crews go out whaling before the date set by the KWCA in a meeting usually held some time in August. On days when conditions are good for whaling, all active crews will usually go out as early in the day as possible. No crew may make the initial strike on a whale after 5:00 p.m., and very few initial strikes are made in foggy conditions. Kaktovik whalers prefer not to whale, or even tow, when visibility is decreased—especially if there is also a significant amount of ice cover. Kaktovik whalers are also less likely to go whaling in marginal weather conditions (wind and/or wave height) than whalers from some other communities. All of these decisions or rules deal with conditions that increase the danger to the whalers and their boats, and also increase the possibilities of losing a whale. Kaktovik whalers decrease their opportunities to strike whales somewhat by adherence to these rules but gain an increase in safety and rate of success (fewer struck-and-lost whales). Since they whale directly from Kaktovik, they have a somewhat greater degree of flexibility in terms of length of season, and less lost "opportunity cost" of waiting out or avoiding adverse whaling conditions, than do those whalers that whale at a distance from their communities. As long as whales are present and their quota has not been completed, Kaktovik whalers can be prepared to go out whaling.

A whale harvested by a Kaktovik whaling crew is towed back to Kaktovik for butchering so that the successful captain (and his wife and other supporters) can feed those assisting with the butchering and then "feed the village" from the captain's house. All North Slope communities have communal festivities for Thanksgiving and Christmas, and maktak and whale meat are important components of the food served (and distributed for consumption later) at both events in Kaktovik. Each successful captain sets the date for his Nalukataq. In Kaktovik these are almost always late in June and are frequently joint or cooperative events.

Most active whaling captains in Kaktovik (eight at present) are either employed full-time or are retired from work. One or two work part-time or seasonally. All fulfill the normative expectation of supplying the equipment and other needs of their crew, but most also receive substantial aid in doing so from their relatives/crew members. In Kaktovik, whaling crews are above all based on kinship relationships, rely on the cooperation of a number of related households, and have been remarkably stable over time. Once established, most Kaktovik crews continue even after the death or retirement of a whaling captain (although "succession" may be by any of a number of relatives—a sibling, a child, an in-law, etc.). Several Kaktovik crews are formally captained by elders who may or may not actually go out in the boat looking for whales (or may do so only relatively infrequently). All have very active (and younger) co-captains.

Even though most Kaktovik whaling captains are employed, almost all crews rely on significant contributions of material support from non-household members, as well as the time and labor of their crew members. Whaling captains typically own all the equipment necessary to whale (boat, motor, darting gun, shoulder gun, float, butchering tools, and so on)—but at least one crew depends on the boat and motor of the co-captain. Elder-captains who may or may not still actively go out in the boat tend to formally own this equipment and provide advice to the active co-captain. In some cases such an elder-captain may "retire" as a whaling captain and formally

pass the crew on to another. Formal ownership of the equipment may be transferred at the same time, but need not be. The new captain may in fact acquire his own set of equipment, or at least a partial set. The retired captain will provide advice and guidance, and usually substantial material support as well. In the event of the death of a captain the crew may or may not take a year off, but the crew and equipment tend to be passed on to a son or other relative. The widow of a captain will sometimes retain the formal status of captain or head of a crew, with a son as an active co-captain. Each captain maintains an ice cellar, as there is no other practical way to store the butchered whale (although some captains have recently stored at least some of the meat and maktak in walk-in freezers provided by industry through the CAA). These cellars tend to be associated with the crew and family as much as with the individual captain, although they are also used to store other food items such as seal, caribou, and fish.

Crews in Kaktovik tend to be single-boat crews. When the membership of a crew grows so large that people cannot go out in the boat looking for whales as often as they would like, a group tends to split off to form a new crew. This has not occurred recently in Kaktovik, and the number of active crews has been quite stable. A large proportion of the Kaktovik adult male population actively engages in whaling by going out in the whaling boats, but even more (and perhaps most) of Kaktovik's population participates in whaling by helping with butchering or some other support capacity. Most Kaktovik residents will receive part of the harvest through direct consumption or sharing at the festivities at Thanksgiving, Christmas, and Nalukataq.

The Sunday before the first day set for boats to go out whaling, services will be held in both Kaktovik churches—Presbyterian and Assembly of God. While most Kaktovik residents are probably affiliated with one or the other, most probably do not attend either of these services, and some may attend both. The Presbyterian church and congregation, as the older of the two in Kaktovik, are especially associated with the captains and senior members of several of the whaling crews. One captain is the lay preacher and several others are deacons and other officers. At the services, and others held during the whaling season, special prayers for the whalers are part of each service. Some, and perhaps all, crews will have at least a short ceremony or prayer before launching their boat for the first time each season, and some crews pray before each whaling trip.

Crews go out scouting on Sunday as on any other day, if conditions are favorable, since the whalers never know if it may be the last suitable day for whaling or not. When a whale is struck, no one talks about it on the radio except in connection with enabling the other boats to assist in the chase and harvest. The crew that struck first is not identified explicitly over the radio. Once the whale is taken the successful captain will pray over the VHF radio, after which the crew will cheer and receive the radioed congratulations and cheers from other crews.

Kaktovik whalers butcher and distribute the whale according to specific rules, most relating to how to share the whale. These are similar to those for other villages (Daniel and Lillian Akootchook, interview), or documented in the literature (Worl 1980). The captain of the first crew to strike the whale receives credit for taking that whale and receives a large share of the whale. He is expected to redistribute a good deal of this, and does so, so that most whales taken are in fact treated as community property.

4.2.5.3 The Cultural Context: The Seasonal Round

Preparations for whaling, in one form or another, take place during the entire year. There is no obvious "beginning" of the overall subsistence cycle in general, or of the whaling component in particular, so that a description can use any arbitrary starting point. Whaling preparations become most obvious in August, when captains (and crews) start to become preoccupied with the final preparation of boats and other equipment. Labor Day is the normative date for the start of whaling, although sometimes the crews will decide to go out sooner, especially if Labor Day is "late." Nalukataq, the celebration for taking a whale, would have taken place in late June. June and July would have been spent in other subsistence activities (caribou, perhaps fish). Thus, by the beginning of August people start to think of what needs to be done to get ready for whaling in September. In most cases, the crew roster will already be pretty much established, but people who have not whaled before (or not on a regular basis) may ask a captain if they can whale with him. Most "regular" crew members will also tell their captain that they will be whaling, but this will in most cases have been assumed in any event. Besides making sure that the boat is running well and that the equipment is cleaned and ready, the captain and crew must clean the ice cellar and their yards, so that the whale will want to come to them. A list of necessary supplies must be compiled and then acquired. This includes subsistence food, and captains will try to obtain, at minimum, a supply of caribou for their crews (if they have not already done so). Waterfowl will also be hunted during their migration periods.

The KWCA will conduct a meeting in August to go over the rules of the hunt, as well as to determine when they should start the hunt. No crew will go out before this date to hunt, although some may go boating for other purposes and note if there are whales present and, if so, where they are. On the day chosen for the start of the hunt, weather permitting, each crew will try to launch its boat as early as possible. Some crews leave earlier than others, however, so that even though the hunt is cooperative, there is also a friendly competitive aspect. It should be noted that it is not always an advantage to be one of the first crews to leave the village to go whaling. The last crew to leave the village for the day has been known to strike a whale that only appeared after all the other boats had already passed by that location. Plate D illustrates some aspects and symbols of subsistence activity in the community.

Once whaling starts, crews will go out for whales on every day that weather allows—except that once a whale is taken no crew goes out until it is fully butchered and divided. Not all boats will necessarily go out every day, and not all at the same time, but the norm is that all crews go out whenever it is possible to do so, until the village quota of three whales is achieved. Sometimes the crew (or crews) that have been successful will stay in until another whale is struck. It is unusual for fewer than five boats to be out whaling, and if a whale is struck the crews that happen to have stayed in will usually go out to help with the tow. In some years, with good weather, the quota can be taken within a week. In other years it may take all of September and even part of October. In recent years the season has not often gone past the end of September.

Once the whales are taken, butchered, the village fed at the successful captains' homes, and the whale put away, Kaktovik residents turn to other activities. Sheep hunting and ice fishing are the primary subsistence activities after whaling, although caribou, seal, and other species are hunted if they are available. This is the time of year (along with early spring) when the most salient

Subsistence

Packed sled for overland trip to go bird hunting

Subsistence activities pennant

Subsistence activities pennant

Whaling pennant with local crew flags

Kaktovik - Plate D

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subsistence activities revolve around trips to the mountains—for sheep and upriver fish camp. In winter, subsistence activities lessen, although people will go out hunting if they need meat and animals are available. Some people will hunt furbearers in the winter (when the pelts are best) and caribou, but most people wait until March or April, when the days start to be longer and conditions are somewhat less harsh. People will devote a week or two to hunting birds during the spring migration. Seals will be hunted year-round, when available. Many people will spend several weeks at fish camp at some time during the summer, and most caribou are taken in the 4 months of June through September. The "surplus" of all this activity is either distributed to other households (many but not all of them associated with the whaling crew) or stored in the ice cellar until needed, either for the crew or for other redistribution needs.

During September, most hunters in Kaktovik concentrate on whaling. Those who go out whaling resist the urge to take seals or other targets of opportunity. The exception might be if a boat on its way back to Kaktovik (after an unsuccessful hunt) had a need for a seal or other animal, and had no potential chance to strike a whale. Hunters who do not go out in whaling boats may go out after other animals. If a whale is taken, however, almost all residents (except those out on camping trips) will help with butchering and other processing. Because whaling attracts polar bears to Kaktovik, nuisance bears are sometimes taken to protect people and property. Kaktovik residents prefer to chase nuisance bears away rather than kill them and welcome polar bears and animals to feed on the whale carcasses (at the disposal site, away from the butchering site) when the butchering is finished. It is still not uncommon for one or more bears to be killed during whaling in any given year.

The subsistence activities of a captain and his crew also support the celebrations and festivities associated with whaling throughout the year. As in other villages, there are four main occasions:

- "Feeding the Village" after butchering the whale is finished (usually September in Kaktovik);
- Thanksgiving—communal feast and distribution for later consumption (November);
- Christmas—communal feast and distribution for later consumption (December); and
- Nalukataq—communal feast and distribution for later consumption (June).

A captain is expected to be "rich in meat" and the more that is distributed, both in terms of variety and amount, at each of these events, the more successful the event is deemed to have been. A whaling captain is also expected to help those in need throughout the year, regardless if they are relatives or part of his crew or not. Thus, whaling captains and related households will hunt throughout the year, both to share with others and to store in the ice cellar for these major sharing and redistribution events. Birds for soup are especially appreciated at these events, and it is not unusual for a crew to use up to 200 ducks and geese in all (perhaps half for Nalukataq, and half for the other three events combined).

4.2.5.4 Whaling Crew and Non-whaling Crew Participation

All those engaged in any sort of whaling activities ("direct" or "support") are part of a crew. In another sense, however, "whaling crew" as a term is used in several different ways by Kaktovik

residents. In its most constrained meaning, it refers to those people who actually go out in the boat to hunt whales, and this appears to be one main interpretation of the definition of "crew" in the AEWC by-laws (discussed below). In its most expansive form, "crew" in Kaktovik refers to all members of those households that contribute in some way (usually time and labor, as well as contributions of different sorts of material resources) to the preparation for, direct conduct of, or celebration of, whaling. The definition of this category of people may become somewhat circular—crew members are expected to help with Thanksgiving, Christmas, and especially Nalukataq—and those who help with these activities are considered to be crew members. In practical terms, those people who help the most and actually do most of the work associated with whaling, its preparations, and festivities are considered core crew members. This will often include all members of the households of individuals who actually go out in the boat to whale, although sometimes an individual will go out with a different crew than the one most of his household members are affiliated with. Many crew members will belong to the same crew for several years, and ideally for life. Households will most often be associated with a crew because of kinship relationships with the captain. Because many, if not most, households in Kaktovik can trace a kinship relationship to most other households, there can be a large element of choice in these matters. Most households do have a historic or regular crew affiliation, although even this can vary from year to year, if one or more captains decide not to whale for some reason. This is not as variable in Kaktovik as in Nuiqsut, however.

Because Kaktovik whalers use the village as a logistical base and all whaling trips are essentially day trips, the actual crew in the boat can vary from day to day. This has at least two effects. First, it allows (or requires, depending on one's point of view) a captain to have a larger pool of possible crew members than in some other villages (Nuiqsut, for instance). Second, it makes it easier for a crew member to be "part-time" and to fit whaling into a schedule of wage labor. People can watch the weather and take a few days off when conditions look most promising, rather than "waste" subsistence leave (or vacation) time on periods when wind, fog, or other conditions make whaling difficult or impossible. Crew members can also take time off for other reasons. As one captain put it, "Those who show up [early enough] in the morning get to go in the boat." Most captains also say that the skill position people—driver and harpooner—tend to be steady and go out on every trip. The float man and others (for a total of up to six or so for a Kaktovik boat) will be more variable. All of these people (and possibly their households and relatives) will be considered crew members, so that Kaktovik whaling crews can be quite large.

In Kaktovik, in fact, it may be that all Iñupiat are in some sense members of a whaling crew. Some contribute with monetary support. Others provide in-kind goods and material, or services such as boat and radio maintenance. Nearly all participate in the redistribution events discussed above.

4.2.5.5 Whaling Technology

Kaktovik whalers first used wood boats (some of which, although now unused, remain beached near the lagoon) and relatively small motors. Although they remember these vessels with fondness, they also remember that they were limited in terms of speed. Currently, Kaktovik whalers all use aluminum or fiberglass boats, generally 17 to 24 feet long, with motors of 80 to 225 horsepower. It is possible that a 16-foot boat may be used for whaling on occasion, but it

would not be considered a primary boat. Some boats have cabins, while others are open. Boats typically scout for whales with a complement of three or four people, although boat crews could be as small as two and as big as eight. Although single boats from other villages have taken whales on occasion, it is not encouraged and Kaktovik boats always scout for whales in pairs, in case of mechanical breakdowns or other emergencies. Usually more than two boats will be within sight (or at least within easy communication) of each other. It is commonly agreed that five to seven boats is a preferable number to have available for whaling on a given day. More boats would be useful, and the availability of fewer boats decreases the efficiency, safety, and overall chance for success of the hunt.

Kaktovik whalers generally prefer larger boats and larger motors but do not want so large a boat that it is slow nor so large a motor that they use an excessive amount of gas. Larger motors also make more noise, and whales certainly do react to the sound of their motors. There has been a shift to four-stroke motors from two-stroke motors, since four-stroke motors are more fuel efficient and make less noise. The fuel efficiency is achieved partially with fuel injectors, however, and whalers report that they may require more maintenance and have less power than comparable two-stroke motors. Thus, some captains may still prefer two-strokes, accepting the tradeoff of greater noise and fuel consumption in order to gain greater mechanical reliability and power.

Standard whaling gear used in Kaktovik is similar to that described for Barrow (Section 4.1.5.5). Plate E illustrates some aspects of whaling technology in Kaktovik.

In Kaktovik, and for fall whaling in general, whales must usually be butchered on gravel beaches. Heavy mechanical equipment is also used to help butcher the whale, and then to move the butchered parts. Protecting the maktak and meat from dirt and grit is thus vital. In Kaktovik this has been accomplished at least in some years by placing as much of the butchered portions of the whale as possible directly into the bucket of a mechanical loader. The loader then transports these cuts to a tundra location where the formal division into crew shares will later take place. This solution also avoids the necessity for packaging the cuts into plastic bags and handling them several times before the division into crew shares. Once the division into crew shares is made, these shares are transported to each captain's house (by loader or truck), and divided into shares for each crew member. In the case of the captain who took the whale, his crew will also help process that large portion of the whale for which the captain is responsible for storing for the Thanksgiving, Christmas, and Nalukataq festivities. The processed shares will then be taken to the ice cellars or crew members' homes.

Some Kaktovik boats still have compasses, but all now have some sort of handheld GPS device and most crews know how to use such devices to follow past tracks in memory or to navigate to previously marked waypoints. While scouting, crews will commonly keep track of how far they are from Kaktovik and/or some other point of interest as a way of informing other boats where they are located. Boats communicate over VHF radios, which are installed in all boats by an NSB technician prior to the whaling season and removed soon thereafter. Most crews in fact have their own VHF radios, but this program ensures that all boats have communication ability and can keep in touch with not only the Whaling Communication Center, but also each other, and the "home bases" in Kaktovik. In the past, Kaktovik whalers used CB radios, which had a

shorter range and were not as reliable. Before CB radios, communication was much more difficult and the need to maintain visual contact with other boats was more critical.

Kaktovik whalers pull whales up on the beach using a small loader borrowed from the NSB. The loader is also a very important tool during butchering, compensating for a relatively small labor force with its mechanical advantage. Kaktovik is not unique in this regard by any means—the other fall whaling villages (Barrow and Nuiqsut) also use heavy equipment to aid their butchering tasks. The loader is used to provide tension when cutting large parts of the whale, to manipulate the whale to speed up the removal of internal organs and such, and to move and turn it over to speed up overall butchering. The loader also is used to move the massive amounts of butchered products and waste material. For the most part, Kaktovik whalers put their boats in the water and take them out with boat trailers pulled by trucks, but they can also use a loader for this purpose if necessary.

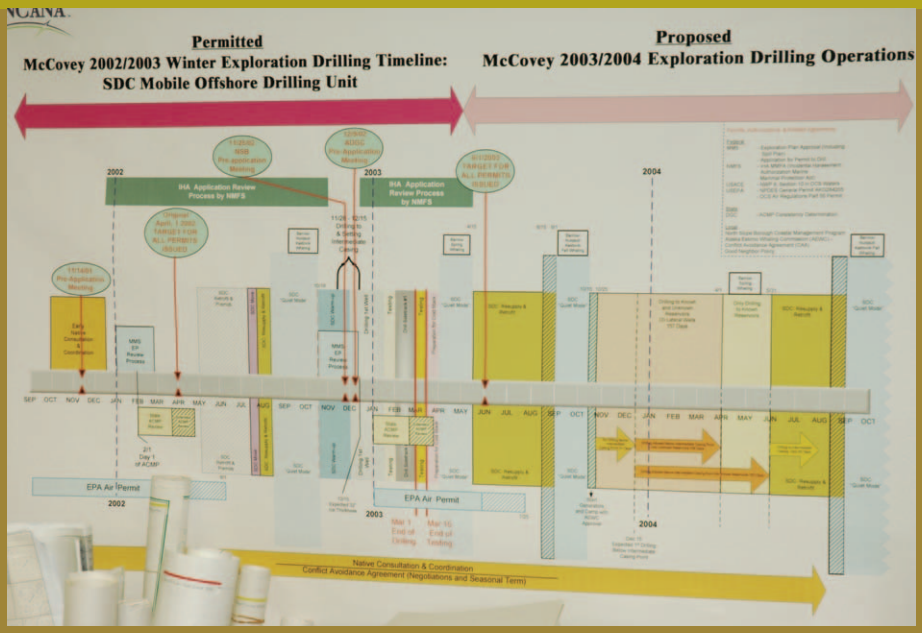
While not usually classified as "whaling technology" Kaktovik whalers also have the advantage of the infrastructure that supports Kaktovik. This includes access to electricity, gas, food, maintenance facilities (of sorts) for boats, and comfortable beds at night. Access to the airstrip means that, weather permitting, spare parts or other things needed for whaling are only a phone call and plane flight away (Fairbanks or Anchorage). Everyone living in Kaktovik is potentially available to help butcher a whale, since the butcher site is within a stone's throw of the village.

4.2.5.6 Crew

The AEWC defines a "whaling crew" as "those persons who participate directly in the harvest or attempted harvest of the bowhead whale and are under the supervision of a captain" (AEWC 1995:4). Section 4.2.5.4 above discusses "crew" in its more expansive meanings, but the AEWC definition corresponds very closely to the Kaktovik category of those people who go out in a whaling boat during the fall whaling season. These individuals are certainly regarded as the core and most active members of their respective whaling crews and will be the focus of this section. As discussed above, however, not all such crew members always go out scouting for whales every time the crew's boat or boats go out scouting. There are many onshore tasks that need to be accomplished while the boats are out whaling, and all who contribute by assisting with these tasks are considered valuable crew members. Not all captains go out in the boat, due to age or other reasons, as discussed above. None of the Kaktovik captains who regularly go out in the boats were captains when whaling was resumed in the community in 1964, although some of the elders participated in that resumption. Thus most active Kaktovik whalers have acquired their experience in Kaktovik, although some have also whaled in the spring in other communities (primarily Barrow). No Kaktovik whaling captain is extremely young. Three would probably be classified as young/middle-aged, and five as age 50-plus. Of these five, at least four and possibly all five are considered to be elders (over age 60).

It is not totally clear if the AEWC definition of crew is meant to be the same as the idea of a "boat crew." It is clear that in Kaktovik the labor required to support the harvest of a whale, let alone to butcher and process it, is far beyond that of the boat crews that bring that whale in. A "boat crew" is thus a subset or a part of a larger whaling crew. For this section, "whaling crew" refers to all those persons in Kaktovik directly under the supervision of, or assisting, a whaling

Whaling Technology



Conflict Avoidance Agreement

Crew with harpoon

Whaling crews often use two boats

Traditional whale bomb

Kaktovik\Nuiqsut- Plate E

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captain. Note that not all such persons actively scout for or hunt whales on the water (especially if they are young), but all will help in butchering and other support activities and are important for the success of Kaktovik whaling. "Boat crew" refers to those persons who actually go out in a given boat on a given day. Boat crews can, and do, vary from day to day, although they tend to be stable in at least the primary skill positions (driver and harpooner). The number and composition of the other people on a boat crew on a given day can be much more variable, and it is more variable for some whaling crews than for others. Whaling crews also change over time. In recent years most Kaktovik whaling crews have used one boat. When a crew grows too large for all who want to go in the boat to do so, a subgroup will split off and form a new crew.

In 1964, when Kaktovik whaling resumed, several boats went out whaling. The captains all had experience whaling in Barrow and had noted that whales in the Kaktovik area had been increasingly evident. The first year they did not have the "proper" whaling gear, relying on a .50 caliber rifle and such other gear as they had. In later years, those with steady employment were able to buy whale bombs and shoulder and darting guns. Over the years, the number of crews increased to the present eight (with some fluctuation in numbers due to economic ups and downs). In the recent past the number of crews has been quite steady at eight, with one boat per crew (although one crew sat out a year due the death of their captain). There is little incentive for a captain to run more than one boat, and all those who want to go out whaling seem to have an opportunity to do so. There are men in Kaktovik with the resources and experience to form new whaling crews, should they desire to do so. Crews typically consist of four or five members, with a minimum of three. Most crew members are male—ranging in age from teenagers to those in their 40s and 50s. Usually the only elders who go in the boat are captains, and they will not go on every trip. Only one, and in very unusual cases two, younger crew members will go in the boat, and when they do it is usually as additional crew members rather than in place of more adult crew members. Kaktovik whalers explain this as a desire to let young people participate in whaling and to learn by watching, while at the same time wishing to minimize the danger to those young people (and themselves). Too many inexperienced people in a boat could be dangerous in an emergency. The reasons to carry more than the minimum three crew members required for the necessary functions of striking a whale include the ability of larger crews to deal with emergency situations, and also the ability to sight more whales, companionship, and the necessity to train the next generation.

All those in the boat have vital roles, but, as in other villages, whalers (captains and non-captains alike) explained that the captain had primary responsibility for the safety of his crew. An important aspect of this is the experience and knowledge of how to approach a whale, and especially how to react to and withdraw from a struck whale that is potentially dangerous to the boat. That is why elder-captains will sometimes still go out in the boat, even after they are sure that their co-captain is fully capable of successfully handling all such situations, and teaching others how to do so. Often relatively inexperienced whalers are allowed to try to strike whales, with the explanation that harpooners have to learn sometime and that experience is the best teacher. It is the driver's responsibility to put the harpooner in a position to strike the whale and to avoid getting contact from the whale after it is harpooned. Thus only crew members with experience or who had been part of a boat crew for several years are allowed to be drivers. In most cases the drivers are captains or co-captains. The "float man" was the typical position for the person on the boat crew gaining experience and waiting to move up "to the front of the boat"

as harpooner (although not all harpooners are necessarily at the front of the boat—that is their historical position and preferred position, but some boat configurations do not allow it).

Crews are all fundamentally kinship based, although non-kin can also be members. Given that most Kaktovik residents are related in some way to each other, crews differ primarily in the degree to which close kinship relationships exist between the captain and his crew members. For some crews, long-term friendships are clearly important for certain positions, but kinship relationships still provide a fundamental recruiting basis for the crew. Almost all Kaktovik captains interviewed during this study explained that they did not need to recruit their crews. They have little turnover from year to year, except for people who move or need to stay in town for work or personal reasons. Captains also noted that elders had taught them "never to say no" if someone asked to go out whaling with them. Thus, most captains have no trouble filling their boats and crews. Potential crew members, and especially young and inexperienced ones, tend to ask captains with whom they have a close kinship relationship or some other tie, which reinforces these aspects of crew composition.

4.2.5.7 Beliefs and Values about Whaling

The limited information about whaling beliefs and values collected during this project revealed that many of the beliefs and values held by Kaktovik residents are similar to those held by Barrow and Nuiqsut residents. For example, in all three communities certain spiritual aspects of whaling are closely related to notions of the proper behavior that whaling captains and their crews should exhibit. The relations people have with each other—how they treat each other—are often phrased in terms of how people should behave when whaling or act toward whales. Whales are aware of, and intensely interested in, the human world. In a fundamental way, the whale models all aspects of the Iñupiaq world (Oleska 2005).

In addition, all three communities share a conviction that whaling and the future of Iñupiaq society are inextricably linked. Comments heard during interviews with project community residents echoed the following statement of the sociocultural significance of the bowhead whale hunt to the NSB project communities:

> *Bowhead whale hunting strengthens family and community ties and the sense of a common Iñupiaq heritage, culture, and way of life. In this way, whale-hunting activities provide strength, purpose, and unity in the face of rapid change.* (MMS 2002:VI-54)

4.2.6 Nexus of Whaling and OCS

All Kaktovik residents interviewed in the course of this study reacted negatively to the idea of offshore/OCS activity or development, regardless if the projects were in state or federal waters. "The ocean is our garden" was a commonly heard rationale for this opposition. Another was that "no animal fouls its own nest." Some specific objections documented by this project were the following:

- Kaktovik whalers think that, in general, industry decision-makers fail to appreciate the power of ice and weather to harm offshore oil development installations. They note industry's lack of long-term experience and knowledge of offshore environmental conditions. There has not been any demonstration that the technology to clean up oil spills in broken ice conditions exists, nor of the organization to deploy it effectively even if it did exist.
- Oil spills would potentially devastate subsistence resource populations, at least for a certain number of seasons. Oil spills may be especially destructive to coast lagoon resources.
- Even though oil spills may be low-probability events, they are inevitable (the *Exxon Valdez* oil spill was frequently cited as an example).
- Whales and other marine mammals are very sensitive to noises and unusual activities, and their behaviors are changed by oil exploration, development, and production. Kaktovik whalers state that industry activities are affecting the whales' behavior. These changes, in turn, can potentially affect the safety of whalers. For example, industry activities (vessel traffic, aircraft, seismic or drilling activities) can "spook" whales so that they react in less predictable ways or can deflect the whale migration farther offshore.

Kaktovik residents acknowledge the economic benefits of onshore petroleum development, especially in ANWR. The NSB's property tax base would increase, and the ASRC and KIC could benefit directly as they own mineral rights within ANWR. As discussed above, most Kaktovik residents have strongly supported oil and gas development in ANWR in the past. However, some residents interviewed during this study expressed concern that petroleum development in ANWR may facilitate the development of offshore areas near Kaktovik. This study did not attempt to trace the evolution of attitudes in Kaktovik toward petroleum development in ANWR, but it would appear that, without the possibility of nearby offshore development, more Kaktovik residents would be in favor of development in ANWR than is currently the case. The perception that onshore development in ANWR may be a "stalking horse" for offshore development has apparently made some Kaktovik residents leery of any local petroleum development. Their concerns are expressed most commonly in terms of potential adverse effects on subsistence resources and activities, especially whales and whaling, but perceived dangers to human health from exposure to carcinogens and other pollutants are also often cited.

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NUIQSUT

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4.3 NUIQSUT

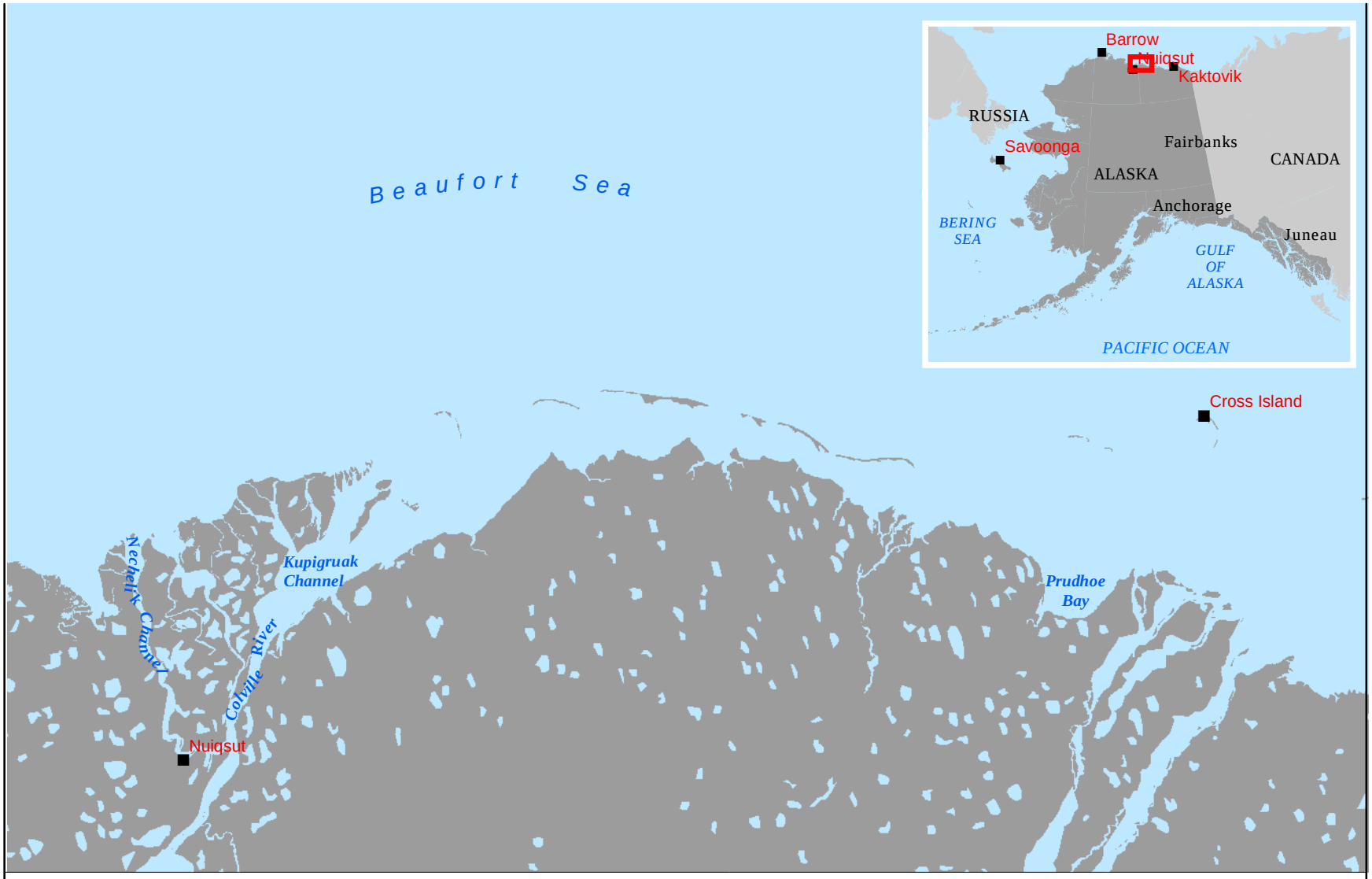
4.3.1 Background and History

The people of Nuiqsut call themselves Kuukpikmuit, or the "People of the lower Colville River" (BLM 2005). The name Nuiqsut recalls prehistoric and historic camps and settlements occupied by many families on the main channel of the Colville River that had been used traditionally as an area for hunting, fishing, trapping, and trading. Additionally, there was a seasonal trade fair at the mouth of the Colville River, where many Iñupiat from different areas would meet. Most residents in the area moved to Barrow when the BIA mandated school attendance for children in the 1940s. However, former residents continued to use the Colville River area for subsistence purposes. The passage of the ANCSA led to the reestablishment of the community. In April 1973, the community of Nuiqsut was resettled by 27 families who embarked on a 150-mile trek from Barrow to the Colville River. Many of these people had lived in the Colville River area 25 to 30 years earlier and were "seeking an alternative to the accelerating urbanization of Barrow" (Libbey et al. 1979; cited in BLM 2005). These original resettlers traveled from Barrow with the supplies necessary for their life in tents for a year or more, as only one small cabin existed on the site before the move. One of the original founders (and the first mayor of Nuiqsut) took the first whale for Nuiqsut that fall, which was important for qualifying Nuiqsut as one of the original 9 (now 10) whaling communities that formed the AEWC.

Nuiqsut is not located directly on the coast; rather, it is about 16 miles inland on a channel of the Colville River, an atypical location for a whaling community. Figure 4.3-1 shows the location of Nuiqsut, and some of the important regional features surrounding Nuiqsut. The residents of Nuiqsut harvest bowhead whales from Cross Island in the fall. In the past, they used Narwhal Island as a base and still have structures there (BLM 2005). Cross Island has cabins and equipment for hauling up and butchering the whales. The island is about 73 miles northeast of Nuiqsut and 92 to 109 miles away by boat, depending on which channel of the Colville River can be used to reach the ocean from Nuiqsut. When the water level in the river is high, the more direct route can be used. Areas west of Nuiqsut are also important for Nuiqsut residents, especially for subsistence (fish, caribou, and other resources), although they are not shown on this map. Nuiqsut is only connected to the road network in the winter, when an ice road from the Kuparuk oil field is constructed to Nuiqsut and points west to support oil and gas exploration and development activities (typically December through May).

4.3.2 Community Characterization

Basic demographic information for Nuiqsut has been presented in Chapter 3 for the year 2000. Overall population was 433, with 88% identifying themselves as Alaska Natives and another 1% as Alaska Native in combination with at least one other "race." Males comprised 60% of the population, and females comprised 40%. The median age was 23.8 years. Fully 45% of the population was under the age of 20, while only 4% was age 65 or greater (11% of the threshold was age 55). Clearly Nuiqsut's population was predominately Iñupiat, demographically young, with a very uneven gender distribution. Of the four study communities, Nuiqsut has both the youngest median age and the greatest difference between the percentages of males and females in the general population. More of Nuiqsut's population is under the age of 20, and less of its



Source: NOAA-2003; ESRI 2003; MMS Alaska 2006

55,000 27,500 0 55,000 Feet

Scale: 1:660,000; 1 inch = 55,000 feet

Figure 4.3-1
Nuiqsut and Cross Island Regional Map

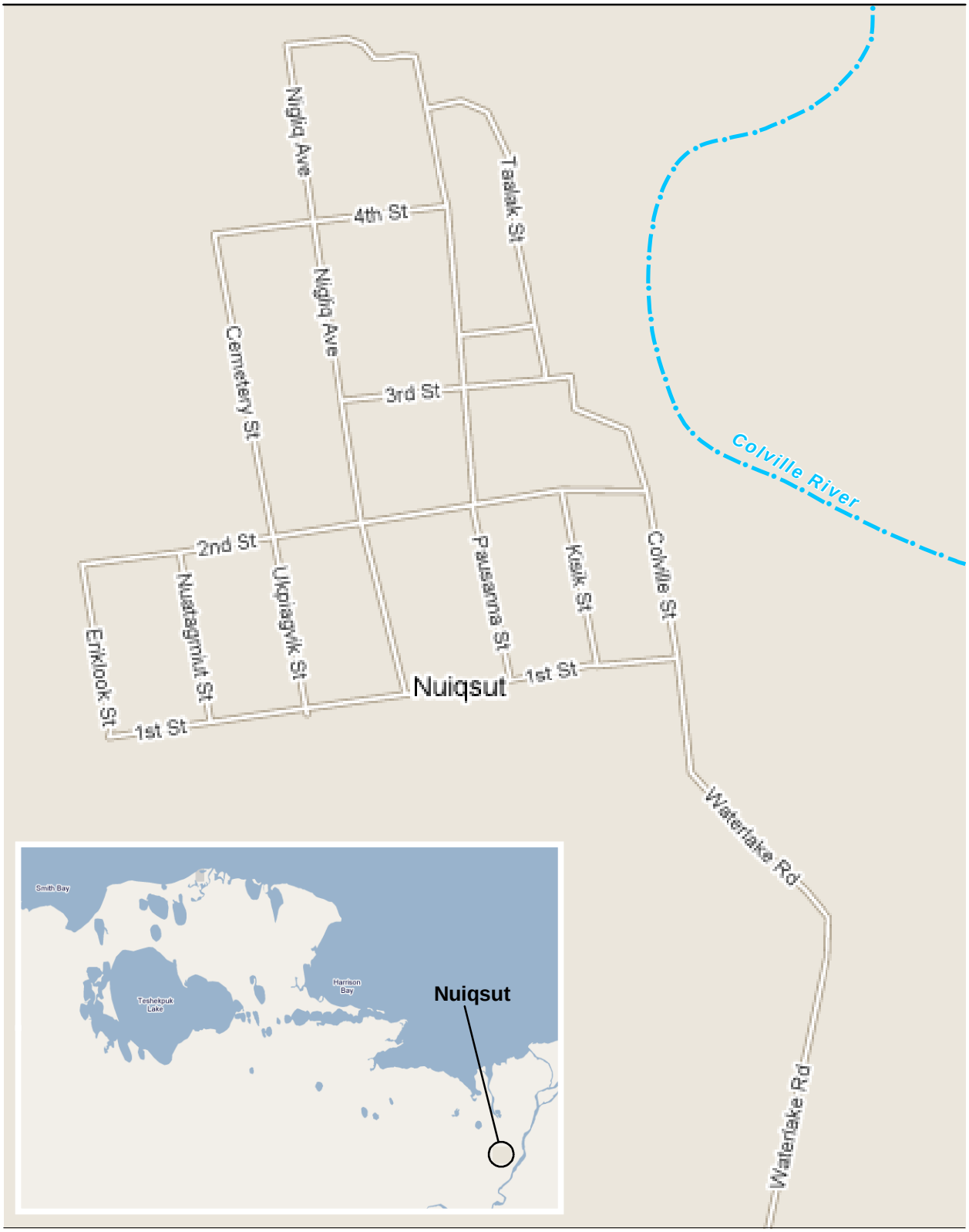
population is over 65 or age 20 to 64, than in any of the other communities (with the exception that Barrow had even fewer elders than Nuiqsut in terms of percentages).

There were 126 housing units in Nuiqsut in 2000, with 110 of them occupied. Of the 126 units, 118 were single-family structures and most (71) were owner-occupied. All of this housing has been built since 1973, increasingly with local labor in conjunction with non-local specialists. All structures receive electricity from the NSB-operated power plant. While most structures lacked complete plumbing in 2000 due to a lack of running water, most are now connected to the recently completed water and sewer system and now have running water and flush toilets. A few units still rely on delivered water and holding tanks or "honey buckets" to dispose of human waste. Phone service is available to all households, although not all subscribe to the service (18% of households lacked phone service in 2000). All but 2% use fuel oil (diesel) for heat, but a natural gas community distribution system has been completed recently and only the connections to the nearby Alpine gas pipeline and from the distribution system to the houses remain until most convert to natural gas heat. The community power plant, which currently runs on diesel, will convert to natural gas first, probably in 2007. Water is provided by a nearby freshwater lake and is treated in a state-of the-art water plant. Sewage is treated in a new sewage treatment facility. Plate A provides an illustration of some of Nuiqsut's community characteristics. Figure 4.3-2 provides a schematic map of the community.

Other infrastructure present in the community includes the "standard" set for which the NSB has responsibility as well some for which there is more local responsibility. NSB infrastructure and non-NSB infrastructure, as shown in Table 4-5, are an impressive array of facilities and infrastructure equivalent to those expected of "typical" American communities and superior to those of many other rural communities despite Nuiqsut's size. Plate B provides an illustration of some aspects of Nuiqsut's infrastructure.

4.3.3 Oil Development and Proximity to Village

The initial discovery and development of the Prudhoe Bay oil field predated the resettlement of the Nuiqsut area, as discussed above. The Kuparuk, West Sak, and Milne Point fields were also discovered prior to the resettlement of Nuiqsut but were not developed until after that date. While that initial development and later expansions of the Prudhoe Bay field impinged on historical land use areas and cultural resources, the development of other fields closer to Nuiqsut has had much more direct effects. While some production from the Prudhoe Bay field started as early as 1969, significant production did not start until the Trans-Alaska Pipeline System, or TAPS, became operational in 1977. Prudhoe Bay oil production peaked in 1987. The Kuparuk field began production in 1981 (and peaked in 1993), and Milne Point began production in 1985 (and peaked in 1998). Endicott began production in 1986, was fully operational in 1988, and peaked in 1992. Production from the Colville River units (Alpine and related fields) began in 1998 and is increasing as more wells are developed. Although the first exploratory well on the OCS was drilled in 1981, production at Northstar did not start until 2001 and apparently peaked in 2004 (National Research Council 2003; Alaska Department of Natural Resources, Division of Oil & Gas 2006). Another offshore project, the Liberty field, may be developed from shore using directional drilling. Two other projects are currently under development in state waters off the Colville River delta (Bailey 2006a; Cashman 2006). Interest in offshore exploration on U.S. and



Source: Google Maps 2006

Figure 4.3-2
Nuiqsut
Village Map

Path: P:\2001\1K118 Bowhead Whaling\5GIS\Mxd\Village_Maps\Nuiqsut_google2.mxd, 01/03/07, LeeJ

Community Characteristics

The Village of Nuiqsut

Housing

View from Cross Island

Leaving for a boat trip to Cross Island

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Table 4-5. Infrastructure Found in the Village of Nuiqsut

NSB Infrastructure	Non-NSB Infrastructure
• Power plant • Water treatment facility and large water storage tanks • Sewage treatment facility • Water and sewage system (running water and flush toilets) • A large, modern school (kindergarten through high school) • Large, two-bay fire station with meeting room • Large, two-bay Department of Municipal Services building (Public Works) with a full array of tools and parts in storage • Some other buildings, mostly converted from other uses, used for various kinds of storage • Police station with holding facilities and officer housing (officers are now itinerant and rotating rather than resident) • Health clinic with housing (nurse's aides and physician assistants are itinerant, as are other health services provided on a regular but less frequent schedule—dentist, eyecare, veterinary, and so on) • NSB Housing Maintenance facilities, with an office, tools, parts storage, and a work area (although most work is done on-site) • Search and Rescue building, with communications and other equipment (snow machines, survival gear, and so on) • Vacant building near the airstrip, built as an airline terminal but never used for that purpose. Several different sorts of services and organizations have occupied it for various periods of time, but none for any extended period. It is currently vacant. • Village coordinator's facilities and Teleconference Center • Teacher housing (rental units)	• Community Center (city offices, a large public use area, and offices available for rent) • Teen Center, operated by the City of Nuiqsut (converted building) • Native Village of Nuiqsut offices (converted from one of the first housing units) • Large Alaska Commercial (AC) store (co-venture with the Kuukpik Corporation, which shares the building with the store) • Old Kuukpik Corporation offices, currently vacant but to be converted into teacher housing • Old Kuukpik Hardware store, currently vacant (was the site of the community store until the AC Store was built, when it became the Kuukpik Hardware store, which closed in July 2005) • Kuukpik Corporation buildings, in use by co-venture partner (Kuukpik Hotel, open seasonally) or vacant • U.S. Post Office • Airstrip with runway lights and wind sock • Tank farm for oil and gas near the airstrip • Earth station array for telephone connections

Canadian OCS land has increased significantly in the last several years and is projected to continue (Bailey 2006a, 2006b, 2006c). While this activity extends through the Chukchi and Beaufort seas, it has historically been and will continue to be concentrated in the mid-Beaufort Sea area most critical to Nuiqsut residents.

As the Prudhoe Bay field was developed, Nuiqsut residents consistently testified that it adversely affected both significant archaeological sites as well as restricted them from traditional, historical, and personal subsistence land-use areas (Federal Lease Sale BF Hearings 1979). This

intensified with the development of the Kuparuk field and has been repeated with each subsequent development (Endicott, Beaufort Sea, Federal Oil and Gas Hearings 1984, 1995). Current Nuiqsut residents perceive themselves as surrounded by oil development, with the prospects for yet more such development. Some major areas of concern include potential effects on human health, pollution and its effects on animal and fish populations in general, and pipeline effects on caribou and subsistence hunters in particular. Offshore exploration and development are especially worrisome to Nuiqsut residents due to potential adverse effects on marine mammals, and especially bowhead whales, and marine mammal hunting (Beaufort Sea Oil and Gas Northstar Hearings 1996).

A limited number of current Nuiqsut residents have found employment in the oil and gas industry, since at least the 1940s when most in fact lived in Barrow. The pattern was and continues to be that such employment is generally in lower-level positions and is temporary in the sense that it does not lead to a career. Relatively few Nuiqsut residents will be employed by the petroleum industry at any given time, although the proximity of the Colville River delta units may have increased these numbers. However, even at Alpine, most Nuiqsut hires have been relatively short-term, for a variety of reasons (although this has not been well documented).

As discussed Section 4.3.1, Nuiqsut was resettled in 1973, when many of the original settlers came from Barrow. The new settlers used a variety of means—sleds towed by a small tracked vehicle, snow machines, and weasels (another tracked vehicle, of World War II vintage). At least one "founding father" mortgaged or sold his property in Barrow to buy the equipment needed for this trip.

For most of the North Slope communities, oil development since 1969 has had an indirect influence because of the increasing level of NSB services supported by the local taxation of oil facilities. The balance of positive and negative effects is open to question. For Nuiqsut, however, more direct effects from oil development have been clear, because of the community's proximity to both onshore and more recent offshore oil development activities, and especially development on land in the Colville River delta owned by the Kuukpik Corporation, the Native corporation created under the authority of the ANCSA for the village of Nuiqsut. This has been incremental, starting with onshore development at Prudhoe Bay, the Kuparuk field to the west of Prudhoe Bay (and to the east of Nuiqsut), exploration and development to the north of Nuiqsut on Native land in the Colville River delta, and exploration and development to the west of Nuiqsut in NPRA. Figure 4.3-3 shows the active and historic OCS lease sales closest to the community. Although quite a few exploratory wells have been drilled in offshore state and federal waters, no production facilities are yet located in federal offshore waters. Endicott and Northstar, both offshore production facilities, are in State of Alaska waters, although Northstar does produce some oil from federal leases through the use of directional drilling. Both of these facilities potentially affect Nuiqsut's subsistence whaling activities that occur at Cross Island, 73 miles northeast of Nuiqsut. Cross Island is about 17 miles east of Northstar, 15 miles northeast of West Dock in Prudhoe Bay, and 10 miles north of Endicott (the end of the causeway).

Infrastructure

Air transport is available year-round;
surface and marine transport only seasonally

Power plant

Trapper School, K-12

City Teen Center

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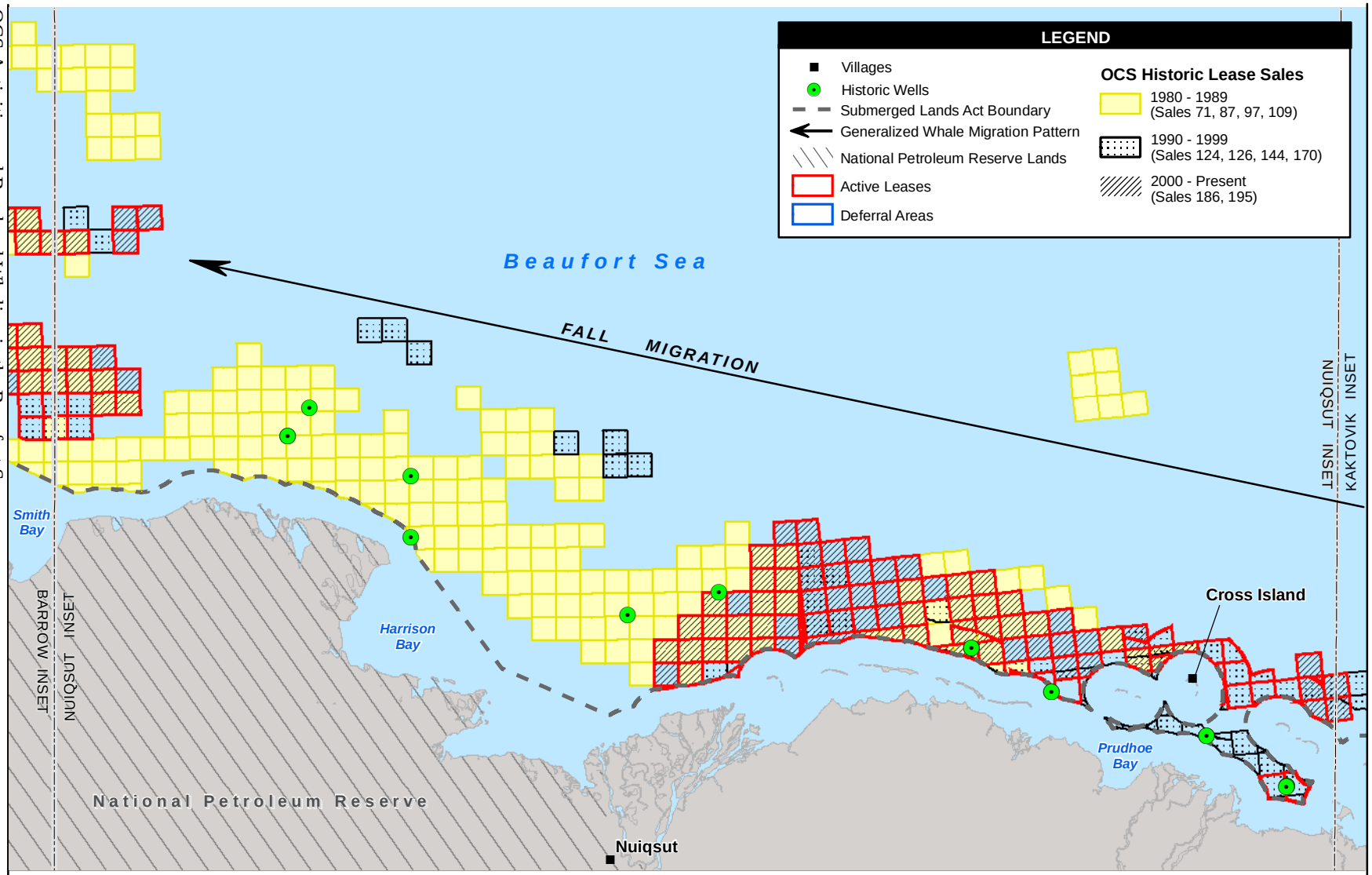

Figure 4.3-3
Active and Historic Federal Leases Closest to Nuiqsut

4.3.4 Subsistence and Cash Economy

4.3.4.1 Employment/Labor

The aforementioned infrastructure (and the services it supports) requires an employed labor force, and most full-time employment in Nuiqsut is a result of this infrastructure and services. Plate C illustrates a few sectors of the economy of Nuiqsut. Though some individuals work full-time in the oil and gas industry (e.g., in the Alpine production facilities), the most significant sources of employment are seasonal projects for the construction or maintenance of other infrastructure, seasonal work on the construction and maintenance of the ice road, and temporary positions as part of the NSB mayor's job program. Seasonal employment is of great importance in Nuiqsut. Although the unemployment rate can be quite high at times, seasonal employment provides opportunities for most, if not all, aspiring workers to find a job. Some people prefer seasonal work, as it allows them to more easily participate in the full range of subsistence activities. The "typical" Nuiqsut resident probably defines his or her lifestyle more in terms of subsistence activities and the subsistence annual cycle than in terms of employment for wages or consumer goods (discussed in Section 4.3.4.2).

Of the 433 residents of Nuiqsut (in 2000), 264 (61%) were part of the potential labor force (ages 16+). The actual labor force (employed plus those seeking work) numbered 194, or 73% of the potential labor force. This is fairly high for a rural Alaskan community. Formal unemployment was only 9% (17 individuals of the labor force of 194) while 33% of the potential labor force was not working. Wage opportunities are available in Nuiqsut for both men and women, although the average male employee probably earns more than the average female employee. Seasonal work is quite important in Nuiqsut. While some residents prefer the security of permanent employment, others prefer seasonal employment, which is more compatible with more extensive subsistence activities. Permanent full-time employees are mostly confined to the weekends, vacations, and short trips after work for their subsistence activities. This works well for the summer, with long days, but less well for seasons with shorter daylight hours. Since most of the seasonal work takes place either in the summer (construction of infrastructure and housing) or the winter (ice road construction and maintenance) when outdoor subsistence activities are at a minimum, seasonal employees have much more flexibility in conducting subsistence activities. Other categories of employees fall in between these groups in terms of how easily they articulate with subsistence activities. Part-time employees generally earn less but have a reasonable ability to engage in subsistence activities. Temporary full-time employees, such as for the mayor's job program positions, tend to forego subsistence activities, except for short trips after work, while employed. Such positions tend to have a term of about 13 weeks, however, so this is a short-term tradeoff. Those individuals who explicitly make the decision not to seek permanent employment would not be considered part of the labor force unless they were actually employed at the time of the census. However, the seasonal pattern of employment has been very stable in Nuiqsut for the recent past, driven by a combination of NSB (and other local) construction projects and oil development-related ice road construction projects.

Per capita income in Nuiqsut for 2000 was $14,876. Median household income was $48,036 and only 2.4% of the population was below the formal poverty level. Sources of income other than wage employment would include:

Labor and Wage Economy

Government infrastructure and service-related employment is significant

Kuukpik Corporation Hotel

Construction activity

Arctic Slope Telephone Association Cooperative

Nuiqsut - Plate C

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- Self-employment. There are a number of business licenses issued to Nuiqsut enterprises, but most of them relate to enterprises for the Kuukpik Corporation or the City of Nuiqsut. There are two stores in Nuiqsut (one large Kuukpik/Alaska Commercial joint venture and one family-owned) and one or two other relatively inactive businesses. Some people also manufacture ulus for sale or barter, and others engage in various craft activities.
- Transfer payments of various sorts, such as foodstamps, WIC benefits, unemployment benefits, Social Security benefits, Supplemental Security Income benefits, child support payments, and so on.
- Other retirement benefits.
- Dividend payments from village and regional Native corporations, and the State of Alaska Permanent Fund Dividend.

For Nuiqsut, the main employers are the NSB and Native corporations, often in conjunction with each other. Native corporations also frequently co-venture with private firms on local (and some non-local) projects. The Kuukpik Corporation also operates the local "hotel," which functions mainly as a camp for the labor force during the winter ice road and the summer construction seasons. When there is space available and sufficient demand, the hotel is open for any visitor to Nuiqsut, but in the last several years it has tended to close during periods when there were no projects in the community.

Wage labor and income are not related to participation to subsistence activities in a simple way, but the generalizations developed in the Kaktovik community discussion apply equally to Nuiqsut.

4.3.4.2 Subsistence Culture and Community

Estimates of subsistence resource harvest and use are rough measures, but the ADF&G estimates (based on three surveys for different years) that the approximate per capita consumption of subsistence food for Nuiqsut is 742 pounds. This can be divided into three components of the same size—fish (mainly freshwater white fish), terrestrial mammals (caribou and moose), and marine mammals (whales and seals). Other resources are of course also harvested and can be important (furbearers, birds, etc.). There is no "average" year so that in some years one of the resource components may comprise much more than a third of the actual subsistence resource use (especially in years when few or no whales are taken) (Galginaitis 1990).

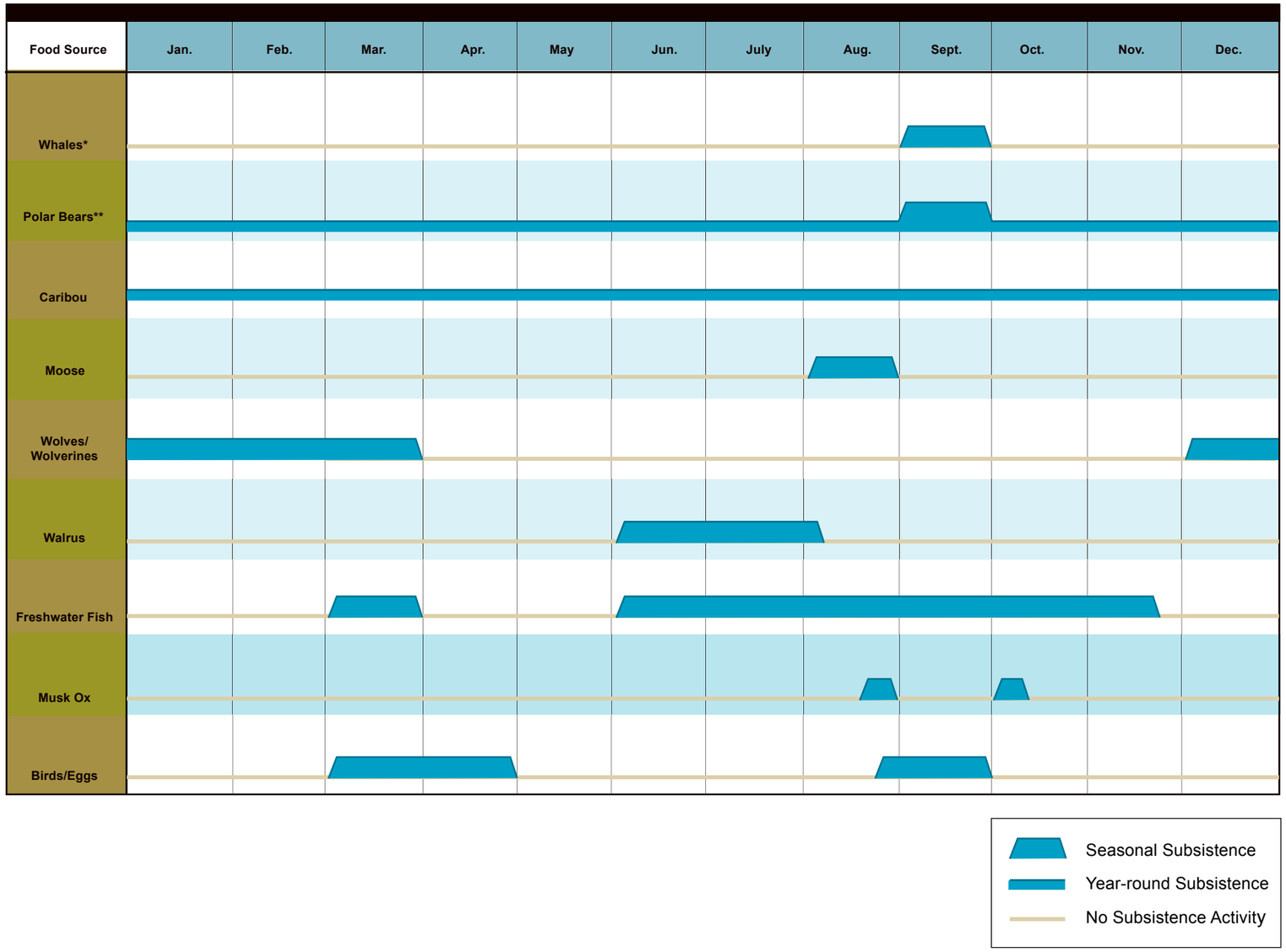
A description of the current subsistence cycle based on Impact Assessment Incorporated (IAI 1990c) and interviews with Nuiqsut hunters conducted in the course of this study is provided in Table 4-6. This table is graphically displayed in the Nuiqsut subsistence hunting calendar (Figure 4.3-4).

The base for Nuiqsut whaling is Cross Island, 90 to 110 miles by boat from Nuiqsut. Most other subsistence whalers stage their hunts from their communities of residence. Thus while in other villages the whaling captain will often be present when his wife and household "feeds the village," most Nuiqsut captains will not be, but will send part of the butchered whale to Nuiqsut

Table 4-6. Nuiqsut Subsistence Cycle

Subsistence	Current hunting/ harvesting season
Whales	Fall whaling occurs early September to mid- or late-September. A limited number of Nuiqsut whalers also whale in the spring as crew members in Barrow. They tend to do so only part of the season, especially if the crew they are part of is successful in taking a whale.
Seal	Ringed, spotted, and bearded seals are important subsistence resources for Nuiqsut hunters. Seals are harvested along the coast, and offshore from Cape Halkett in the west to Foggy Island Bay in the east. In the summer, Nuiqsut hunters harvest ringed and spotted seals in the Colville River as far south as Ocean Point. In the spring, hunters usually shoot seals in the water and on the ice edge.
Walrus	Until 2004, no Nuiqsut whaler had seen or heard a walrus on Cross Island. Some Nuiqsut hunters will take walrus when they visit Barrow and when walrus are available (June, July, maybe August) and someone in Barrow is willing to take them out on a boat.
Polar bear	While polar bear are available almost any time ice is present, Nuiqsut hunters in the recent past have taken them mainly while whaling at Cross Island. The average harvest of polar bears on Cross Island has probably been one to two a year for the last 5 years.
Birds/eggs	One peak will be in the spring, and another in the fall. Ptarmigan are especially hunted in March, when they are still aggregated in flocks and are one of the few sources of fresh meat available.
Caribou	Caribou can be hunted year-round, but there are times of the year when they are only hunted if there is an immediate need for meat such as winter, June, and July. Most of the caribou taken in these months tend to be shot at or near fish camps in the Colville River delta.
Moose	Moose are hunted by boat in August on the Colville, Chandler, and Itkillik rivers. After mid-August the water levels in the rivers are low, preventing access to the best hunting spots. Whaling captains often make an effort to harvest a moose to provide fresh meat for their crew.
Furbearers	Most informants report that the best time to hunt wolf and wolverine is in March. March is when the days start to get longer and the temperature begins to moderate. Conditions continue to be good through April, but after that the pelts start to bleach as the days continue to get longer. Some furbearer hunting may occur almost anytime during the winter, especially if a hunter is out for some other reason and comes across a wolf or wolverine by chance. Few hunters will go out to hunt furbearers as a primary target during winter.
Freshwater fish	All effective fishing begins in June or July and ends in mid-November. Jigging or rod-and-reel fishing may take place in other parts of the year, but the numbers of fish caught are relatively insignificant. Ice fishing for grayling is most significant in the fall, and for lingcod/burbot in March. If weather and ice conditions permit, summer net fishing at fish camps, or near the community, begins in June or July. Gill netting at campsites is most productive between October and mid-November.
Ocean fish	Nuiqsut residents may set nets in the ocean when traveling the coast in summer, but this is not reported to be a primary activity. The overall harvest is small.
Berries/roots/ plants	Berries and plants are only available for a short time. Depending on the variety, they are available along the raised banks of streams and rivers and in wet tundra areas. Berries of numerous varieties are harvested in the Fish and Judy creeks area, and along the Colville, Chandler, Anaktuvuk, and Itkillik rivers. Plants such as Eskimo potato, medicinal plants, and greens are harvested at the same time, usually when families are out at camp hunting and fishing in the late summer.
Musk ox	The preferred time is before whaling (by boat) or after whaling (by boat or snow machine).

Nuiqsut Subsistence Time-line



NOTES:

Locations for whaling in spring and fall are different.

***Spring Whaling**
Nuiqsut whalers participate in spring whaling by joining crews in communities where spring whaling occurs (such as Barrow).

****Polar Bears**
Polar bear hunting occurs primarily on Cross Island during whaling.

This chart is a graphical representation of an idealized annual subsistence activities calendar. It is intended to portray seasons of greater or lesser subsistence activity related to particular species or species groups, but it does not attempt to show varying levels of effort within active seasons or compare levels of effort across different species or activities.

Sources: Galginaitis et al. 2001
Ethnographic Field Notes 2004
ADF&G Community Profile Database

Figure 4.3-4
Subsistence Hunting Calendar for Nuiqsut

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as soon as possible after the harvest. In recent years the AEWC has paid to send this portion of the first whale harvested by Nuiqsut whalers to Nuiqsut by air. The whaling captain's household and/or other relatives in Nuiqsut will be responsible for processing the maktak, meat, and internal organs sent from Cross Island, and for "feeding the village." When a crew member took his first walrus 20 miles from Cross Island in 2004, most of the meat was also sent to Nuiqsut to "feed the village," and especially the elders since this was the first walrus harvested by a Nuiqsut hunter in a long while (other than those taken while visiting Barrow).

Most active whaling captains in Nuiqsut are employed full-time and provide most or all of the supplies needed by their crew members. Some crew members will still volunteer to contribute to these supplies, especially in terms of subsistence food (caribou, moose, etc.). Whaling captains also generally limit the amount of soda and cigarettes that they provide for their crews, and crew members often supplement this supply for their personal consumption. "Care packages" sent from Nuiqsut often contain soda, cigarettes, and other consumable treats. The degree to which these are shared depends upon several factors, including the relative scarcity of the item. At least one crew in Nuiqsut, formed of several brothers whaling for their mother as the captain, is more cooperative in terms of providing equipment and supplies. That is, more households pool their resources to support this crew—boats tend to be owned by the captain's sons (or daughters) but the captain often supplies funds for other equipment needs. The cost of supplies may also be shared, although the captain has the primary responsibility for them for his crew. The ice cellar belongs to the captain, who organizes the overall whaling effort for the crew, and especially the processing of the whale (whether harvested by the crew or a share from another crew's whale) once it arrives in Nuiqsut. Those Nuiqsut crews whose captains (and cooperating households) have less stable sources of income also have less consistent patterns of whaling; in the last 5 years these crews have each whaled only 1 or 2 years (although crew members or even the captain may have whaled in other years as members of other crews).

Nuiqsut whalers butcher and distribute the whale according to specific rules, most relating to how to share the whale. The captain who took the whale (or a designated crew member) makes the first cuts on the blubber that defines the tavsi. These two bands (the captain's belts) are part of the captain's share but are designated to be sent back to Nuiqsut to feed the village and for other public purposes. The tavsi divides the whale into two parts, with the back part generally called uati and designated to be used to feed the community during the three public celebrations (Thanksgiving, Christmas, and Nalukataq) and the front part as niniq to be used for crew shares. Various parts of the whale are excluded from uati and niniq and designated for specific purposes—one flipper is for the harpooner, another is for anyone in the community to take a portion of, and so on. Plate D shows some aspects of the post-landing process. Since generally only the whaling crews are on Cross Island, however, many of these special portions are reabsorbed back into the uati or niniq categories. The harpooner may not want to process the entire flipper himself or it may be too big for him to use, and there is no "general public" on Cross Island during most seasons. Baleen is excluded from the uati, with half being divided among the boats who helped with the tow and half allocated to the captain. Everyone (ideally) helps with the general butchering of the whale, which proceeds in several steps (Table 4-7).

Table 4-7. Preparation for Distribution of Whale Meat

Stage	Step	Task	Process
1: Preparation	1	Peeling	Peeling off the maktak in long strips. The length of these strips is dependent on the size of the whale and can be up to a third of the whale's circumference. The whale is brought up on the beach tail first, on its back. The maktak is peeled from each side, starting the cuts at the top. The maktak strips are perhaps 12 to 16 inches wide and 10 to 14 inches thick. They are left attached to the whale at ground level at this point.
	2	Remove meat and blood	When enough maktak has been peeled off to provide entry to the whale's internal organs, the meat in this region is taken and put into plastic bags. Cuts will also be made to drain as much blood as possible as quickly as possible from the whale.
	3	Harvest internal organs	The internal organs that would be degraded by rough handling (intestines, kidneys sometimes) are then harvested, after which the "guts" are removed as a mass. The heart is retained, and the kidneys if they have not been removed prior to this stage. All internal organs are divided into tavsi, uati, and niniq. The liver is not retained or examined unless someone wants to take the membrane to make drum heads. The stomach is generally not examined unless a request has been made for a stomach sample.
	4	Remove tongue	The tongue will be removed as early in the butchering process as possible, since it is a preferred part, but also one that spoils quickly if left inside the mouth. The tongue will eventually also be divided into tavsi, ord, and niniq. The other internal organs are generally removed before the tongue.
	5	Remove upper jaw	The upper jaw is removed and taken whole over to the uati staging area.
	6	Remove tail flukes	The tail flukes are also removed.
	7	Bags are taken to proper staging area	Generally one side of the whale is butchered before work on the other proceeds too far, as much due to labor supply limits as any other reason. Work will proceed on both sides of the whale at the same time if there are enough workers to allow for this. Generally this is more likely for small whales than large ones. As much meat is taken as is possible, and the bags carried or dragged to the proper staging area (tavsi, uati, or niniq).
	8	Maktak strips cut and dragged to proper staging area	Once the meat has been removed from both sides, the maktak strips will be cut from the whale and they will be dragged to the proper staging area (tavsi, uati, or niniq).
	9	Remove baleen	The baleen is then taken off of the jaw.
	10	Complete butchering	The whale carcass is flipped over and the remaining maktak and meat are butchered.
	11	Remove remaining jaw and meat	The remaining jaw and head are cut off the body. The carcass is taken to the "boneyard" while the skull and lower jaw are taken to where the jawbones of all other whales harvested by Nuiqsut hunters since the mid- to late-1980s are arranged in a line. The eardrums may or may not be removed prior to this move. If they are not, the whaling captain will at some point recover them from the skull.

Stage	Step	Task	Process
2: Crew Division	12	Crews process piles of maktak and prepare for transport	Taking the carcass to the boneyard signifies that the first stage of butchering is over. The next step is for the division of the niniq into crew shares. This is accomplished by creating as many equal piles of maktak, meat, and other items as there are crews. These piles are then randomly assigned to crews. Each crew is then responsible for further processing (butchering) its crew share and dividing it among themselves. All Nuiqsut crews wait until the whale is transported to Nuiqsut to further divide it. After cutting it into smaller pieces and cutting much of the fat off the maktak, they pack it into totes or boxes and prepare these for transport off the island. The harvesting crew is also responsible for the further butchering of the uati, and packing it into totes or boxes.
	13	Crews complete processing before scouting again	Once the head is cut off the whale and the body is taken to the boneyard, crews other than that of the successful captain can go out scouting again. Most crews in fact wait until they have processed their niniq. The successful crew should also process its uati before returning to scouting.
3: Distribution	14	Store and transport	Most of the butchered products are taken to West Dock and stored in cold storage by Alaska Clean Seas barges, as part of the CAA. From West Dock they have in recent years been flown to Nuiqsut, at the expense of various parties (oil companies 1 year, AEWC another, and so on). In past years, the whale was trucked from West Dock to Oliktok Point, where Nuiqsut residents picked it up and transported it to Nuiqsut by boat or snow machine. In the earliest years, Nuiqsut whalers transported the whale completely on their own boats.
	15	Store in cellars for year-round consumption	Once the whale is transported to Nuiqsut, successful captains will store most of their share in their ice cellars until the proper time for its redistribution. Some crew members may also have access to an ice cellar, but many will simply leave their shares in a protected location outside, where it will remain frozen until consumed. Others will store part of their shares in chest freezers. Unalik, fresh maktak that has been boiled, is commonly stored in freezers. Once maktak has been frozen it can no longer be boiled without becoming rubbery, so chest freezers have allowed this preferred dish to be enjoyed year-round.

4.3.4.3 Patterns of Change and Contemporary Issues

The formation of a modern settlement and the development of local full-time wage employment are having significant and long-range effects on the subsistence pattern in Nuiqsut, just as they are in Barrow and Kaktovik. However, as in the other NSB communities in this study, subsistence activities remain important components of the Nuiqsut economy, and of local Iñupiaq culture and identity.

Nuiqsut is situated closer to current and foreseeable areas of petroleum development than any other community on the North Slope. This development has deterred subsistence resource users from hunting, fishing, and gathering at their former harvest areas east of the Colville River and at coastal areas such as Oliktok Point (BLM 2005).

In addition, according to Nuiqsut residents interviewed during this study, in the past, Nuiqsut whaling crews often engaged substantially in other general subsistence activities while whaling—hunting caribou, seal, and birds, as well as setting nets for fish. However, residents report that participation in these other subsistence activities while whaling has dropped. As one whaling captain stated, he and his crew "come to Cross Island to hunt whale, not ugruk." Several factors may account for this change in subsistence harvest patterns:

- The greater availability of cash resources (employment, dividends, etc.) for the purchase of food and supplies decreases the need for such additional subsistence activities while whaling.
- The CAA supplies logistical support not available prior to 1986 and reduces the need for such additional subsistence activities.
- Time constraints of other activities (employment, scheduled meetings, other sorts of deadlines) encourage whalers to try to compress the whaling season into as short a period as possible—2 to 4 weeks is the norm, as opposed to as long as 8 to 10 weeks in the past.

The expense of whaling and the separation from family, imposed by the distance of Cross Island from Nuiqsut, also encourage the compression of the season.

4.3.5 Community and Whaling

Prehistoric use of Cross Island has not been well documented or investigated archaeologically, but documentation for more recent use is quite extensive. Families who lived on and used Cross Island seasonally during the first half of the 20th century included the Woods, Pausanna, Saavgaq, Ulaaq, Ahsoak, Ahgook, Ikpikuk, Ahvakana, Akpik, Sovalik, Kaigelak, Tigulak, Ahsogeak, Ahkivgak, Ekolook, and Ekowana (Smith 1980). An especially well known whaling captain was Taaqpak, who used Cross Island (among other sites) as a whaling base from the early 20th century through the late 1940s. Documentation for his whaling harvests is incomplete but includes accounts of whales taken near Cross Island in 1922, 1927, 1928, and 1938. Taaqpak also had a reindeer herd in the area and many of the men on his whaling crew worked for him, and some of those with reindeer herds to the east of him also whaled with him. Many of today's active

Subsistence

Harvesting baleen after landing a whale on Cross Island

Landed whale

Polar bear inspecting whale bones on Cross Island

Whale meat, ready for shipment, provides protein for whaling communities

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whalers learned from Taaqpak or those who were on his crews. Taaqpak himself maintained that Iñupiat had hunted whales near Cross Island for centuries (Carnahan 1979:21-31). The last documented whale taken in the mid-Beaufort area before the resettlement of Nuiqsut was in 1940 by Taaqpak (NSB 1987). As noted earlier, most residents in the area moved to Barrow when the BIA mandated school attendance for children in the 1940s. The decline of the reindeer industry may also have prompted residents to relocate.

In 1973, the same year that Nuiqsut was resettled, the newly elected mayor harvested a whale inside the barrier islands near the Canning River. The harvest of this whale was important for qualifying Nuiqsut as one of the original nine whaling communities that formed the AEWC. Nuiqsut crews continued to go whaling through the 1970s, but it was not until 1982 that another whale was landed, although whaling was attempted from various locations, including Pingok Island, Narwhal Island, and Cross Island. Nuiqsut whalers attribute at least part of their lack of success during this period to interference from oil and gas exploration, as well as poor weather and ice conditions and a difficult logistical situation due to the distance of the whaling areas from the community. Once Cross Island was established as a base for Nuiqsut whaling, and Nuiqsut whalers gained experience there, harvest success became much more regular. By the 1990s, the number of crews had increased to as many as 11 during a given season. During the last 6 years, only three to five crews have actively whaled on Cross Island; however, most crews have used more than one boat.

Before any crews leave for Cross Island, there is a special church service conducted on their behalf, generally at the Presbyterian Church. A service will also be conducted at the Assembly of God church. When each crew leaves for Cross Island, people from the community gather to see them off at the boat ramp into the river. There is a short message from a clergyperson and/or an elder and a prayer, and candy is distributed, after which the crew leaves. Generally crews that leave together will pray together, although each will distribute candy on its own. Once on Cross Island, some crews will pray by the boat before going out scouting, whereas others do not. Sunday services are sometimes conducted in the senior captain's cabin.

Cross Island is a low sandy barrier island with a higher area built from gravel during oil and gas exploratory drilling. Cross Island is about 3 miles long and 150 yards wide, and is constantly changing due to erosion and redeposition. As noted above, whaling from Cross Island was difficult, especially in the earlier years. With the advent of the Oil-Whalers Agreement, now termed the CAA, in 1986 between the oil industry and fall whalers (represented by the AEWC), whaling from Cross Island has become somewhat easier due to the logistical support supplied at least in part by industry. This support has included low-cost connex units (converted into seasonal cabins on Cross Island); a winch to help haul whales up at Cross Island; assistance with a steadier supply of gasoline; a generator system to supply electricity to the cabins during the whaling season; diesel fuel (for the winch and generator); water and other supplies; help with transporting the butchered whale to Nuiqsut; at least limited phone service for one or two crews; help with mobilization and demobilization; and the assurance of available emergency assistance. Alaska Clean Seas (ACS) is the industry's contractor for much of this CAA support, as a small part of its overall responsibilities (which are mainly logistical and/or related to oil spill response). British Petroleum Exploration Alaska and ConocoPhillips provided most of the funding for ACS prior to 2006, with British Petroleum bearing the majority of CAA-related costs

since ConocoPhillips has little or no offshore interest. In 2006, due to the increase in offshore exploration activities by other petroleum companies, Shell Oil assumed more of the CAA responsibilities. The AEWC pays for some of the services provided under the CAA, but the amount and exact services are not reported. Neither industry nor the AEWC discloses the financial terms of the CAA.

The CAA also provides for constant communication between industry and the whalers about all of their respective ongoing activities, so that each can avoid interfering with the other. The mechanism for this mutual communication is the Whaling Communication Center (WCC—also referred to as the Conflict Avoidance Communication Center or the Oil/Whalers Communications Center) in Deadhorse. The WCC operates during each fall whaling season and is staffed by bilingual radio operators. All industry and whaling vessels are required to report their activities to the WCC in real time (purpose, time left, time returned, significant events as they occur), and the WCC maintains a log of these reports that is archived by the AEWC. This provides a record of activities as they take place and also documents to some extent the whaling activities. It also allows the WCC to advise industry of planned industry activities that may interfere with ongoing whaling, or to suggest windows of opportunity (when whaling is not taking place) when industry activity may have minimal potential effects. Unfortunately, vessel activity not associated with the oil and gas industry (for example, commercial barge traffic) need not coordinate with the WCC in the same way, so that this is not a totally effective mechanism for the mitigation of all such potential effects. Interference from such non-whaling vessel traffic may have affected the 2005 Cross Island whaling season (Galginaitis 2006b).

4.3.5.1 The Cultural Context: The Seasonal Round

Preparations for whaling, in one form or another, take place during the entire year. A summary of the subsistence hunting calendar/timeline has been presented in Section 4.3.4 and is graphically represented in Figure 4.3-4. August marks the final preparation of boats and equipment. The ice cellar, yard, and equipment must be cleaned before the crew can leave. This is not merely the obvious concern that everything must be in working order for the sake of efficiency, but a belief that such cleanliness and order are signs of respect for the whale. A meeting of the Nuiqsut Whaling Captains Association is conducted to set a date for the start of the hunting effort and to review the rules and regulations. Labor Day is the normative date for whaling crews to go to Cross Island, but it is not unusual for individual crews to go out earlier, especially if Labor Day is "late." In 2004, one crew began on August 15. Crews prefer to go out together or with multiple boats, for safety; two boats is usually the minimum number that will go scouting. This was considered extremely early by the other crews, but this captain was thinking that the migration of whales had been earlier in the last several years than it had historically been and that weather in September had been increasingly marginal for whaling in the last several years. A combination of bad weather and mechanical problems did not allow him to fully test his conjectures. The few times that his crew went scouting in August they did not see any whales.

Generally, the crews are on Cross Island to whale in the first week of September. Boats usually go scouting for whales on all possible days unless a whale was taken the prior day, in which case butchering usually has priority. When a whale is taken, it is towed to Cross Island, hauled up on the gravel beach, and butchered. Select parts of the whale are sent to Nuiqsut via whaling boat the

same or the next day "to feed the village." In recent years, the parts from the first whale are flown to Nuiqsut, accompanied by a crew member to "run the flag" to the captain's house upon its arrival in Nuiqsut. The rest of the meat, maktak, organs, and baleen is packed into plastic fish totes (or heavy, reinforced, corrugated cardboard boxes) and transported to West Dock and then to Nuiqsut, most recently via barge and air freight (see Plate D). What is left of the whale is disposed of in the "bone yard." Once the quota is taken or conditions threaten to prevent returning to Nuiqsut (imminent formation of ice or increasingly bad weather), the whalers clean up the island, pack, and leave. Most will return to Nuiqsut together. Captains who have taken whales that season will fly their flags. Whaling will usually be completed by mid- to late-September.

Subsistence harvest activities support the celebrations and festivities associated with whaling throughout the year. A whaling captain is expected to be "rich in meat" and the more that is distributed, both in terms of variety and amount, at each of the festive occasions (Thanksgiving, Christmas, and especially Nalukataq), the more successful the event is deemed to have been. Thus, whaling captains and related households will hunt throughout the year and store subsistence food in the ice cellar for these events. Birds for soup are especially important and one crew typically "budgets" a harvest of 200 ducks and geese—100 for Nalukataq and 100 for the other events.

Redistribution events associated with whaling, as discussed previously, are shown in Table 4-8.

Table 4-8. Hunting Calendar

Month	Activity	Timing
September	"Feeding the Village"	during the whaling season, shortly after harvest
November	Thanksgiving	communal feast and distribution for later consumption
December	Christmas	communal feast and distribution for later consumption
June	Nalukataq	communal feast and distribution for later consumption

In Nuiqsut, the redistribution at Nalukataq tends to be larger in terms of amount than for the previous events. This may be because it is the last formal redistribution event, or because it is the only event specifically celebrating the captain's and crew's harvest of a whale. While Thanksgiving and Christmas have other non-Iñupiaq celebrations associated with them, Nalukataq is the only Iñupiaq celebration specific to the whale harvest.

Whaling captains indicate that, while they make sure to have a good supply of "store" food (flour, sugar, pilot bread, canned goods, and so on), it is also essential that they have plenty of "Native" food; therefore, other types of subsistence hunting become an important aspect of whaling. For most crews this will mean caribou and white fish for certain, and moose if the captain's or a related household has harvested one. The moose season falls immediately before whaling season. Nuiqsut hunters who are lucky enough to draw one of the few permits for musk ox will also try to harvest one before the whaling season, but most are taken after the whaling season. While on Cross Island, whalers will also consume whale meat and maktak once a whale is taken and may try to harvest seal. Few seal have actually been taken by whaling crews in the last 5 years—a bearded seal in 2005 (to share with people in Nuiqsut) and perhaps a few

common seals in previous years (for consumption on Cross Island). A few birds have been taken in recent years for fresh soup.

4.3.5.2 Whaling Crew and Non-whaling Crew Participation

"Non-crew whaling activities" refers to all activities leading up to whaling, in preparation, both direct and supportive, such as sewing and boat making, and indirect, making raincoats and boots (mukluks). As is the case in other whaling villages, the term "whaling crew" is used in several different ways by Nuiqsut residents. In its most constrained meaning, it refers to those people who actually go out to Cross Island. In its most expansive form, it refers to all members of those households that contribute in some way (usually time and labor, as well as contributions of different sorts of material resources) to the preparation for, direct conduct of, or celebration of, whaling. The definition of this category of people may become somewhat circular—crew members are expected to help with Thanksgiving, Christmas, and especially Nalukataq; and those who help with these activities are considered to be crew members. In practical terms, those people who help the most and actually do most of the work associated with whaling, its preparations, and festivities are considered core crew members. This will often include all members of the households of individuals who actually go out to Cross Island to whale, most often crew members who have belonged to the same crew for several years. Households will often be associated with a crew because of kinship relationships with the captain. Because many, if not most, households in Nuiqsut can trace a kinship relationship to most other households, there is a large element of choice in these matters. Most households do have a historic or regular crew affiliation, although even this can vary from year to year, if one or more captains decide not to whale for some reason.

Almost without exception, everyone who goes out to Cross Island will also at some point go out scouting for whales. The exceptions are non-Natives (researchers, industry representatives, spouses of Natives) or crew members who choose to devote themselves to on-island support activities. Both categories have been small—perhaps a total of four to six different non-Natives and two to four Natives in the last 5 years. Because Nuiqsut whalers must take most of what they need to Cross Island themselves, space in their boats is limited. Thus, although most captains will state that they "never say no if someone asks to go whaling," in fact most will discourage people from asking once they have filled their boat or boats. Captains have experienced trying to leave with too many people and too much weight, only to need to add another support boat. Most captains prefer to take no more than four or five people (and their gear) to Cross Island, although some captains have taken more, and these tend to have one-boat crews and their boats tend to have a greater capacity. Since the minimum crew required to scout for whales ranges from three to six, it is not unreasonable that most people who go to Cross Island do so with the intent to go out scouting. To not go scouting, when given the opportunity, is considered unusual. Crew members who cannot get up in the morning are left onshore, and most quickly learn to wake up in the morning. Only young crew members (and the few adults who choose not to go scouting) do not regularly go out scouting.

Many Nuiqsut residents who do not go out to Cross Island provide essential support services to those who do. Activities associated with whaling celebrations and subsistence harvests have been previously discussed. In addition, those engaged in wage labor contribute toward the equipment or supplies needed for whaling crews, although they may not go whaling themselves.

4.3.5.3 Whaling Technology

Nuiqsut whalers first used wood boats and relatively small motors. Although they remember these vessels with fondness, and long for the economy of those motors, they also remember that they were limited in terms of speed and towing capability. Currently Nuiqsut whalers all use aluminum or fiberglass boats, 17 to 24 feet long, with motors of 80 to 225 horsepower. It is possible that a 16-foot boat may be used for whaling on occasion, but it would not be considered a primary boat. Smaller boats, or different types, may be used for support activities (carrying gear and people, but not used for scouting). A few boats have cabins, but most are open. Boats typically scout for whales with a complement of three or four people, although some boat crews are as small as two and as big as eight. Although single boats do take whales on occasion, it is not encouraged and Nuiqsut boats almost always scout for whales in pairs, in case of mechanical breakdowns or other emergencies. Whaling crews with two or three boats are willing to whale on their own, but it is commonly agreed that five to seven boats is a preferable number to have available for whaling on a given day. More boats would be useful, and the availability of fewer boats decreases the efficiency, safety, and overall chance for success of the hunt.

Nuiqsut whalers generally prefer larger boats and larger motors but do not want so large a boat that it is slow nor so large a motor that they use an excessive amount of fuel. Larger motors also make more noise, and whales certainly do react to the sound of motors. There has been a shift to four-stroke motors from two-stroke motors, since four-stroke motors are more fuel efficient and make less noise. The fuel efficiency is achieved partially with fuel injectors, however, and Nuiqsut whalers have experienced some problems with such fuel injectors, such as increased maintenance. At least two Nuiqsut whaling captains prefer two-stroke motors, claiming that they have more power and can be more reliable and easier to fix when things go wrong. They do acknowledge that fuel consumption and noise can be concerns, however.

In practice, most whalers still use black powder explosive bombs rather than penthrite-based bombs, which are still under development and have so far only been used on an experimental basis in Barrow and Nuiqsut. Nuiqsut captains were first issued penthrite whaling bombs in 2005 but were only given one per crew. Some captains did scout with the penthrite bomb ready for a strike on their "number 1" boat, but most boats still used black powder bombs. All shoulder gun bombs use black powder, since the penthrite bombs only fit a special barrel for the darting gun. In any event, no penthrite bombs were used by Nuiqsut whalers in 2005. Most, if not all, harpooners seemed to be more comfortable with the black powder bombs than with the penthrite bombs. Some aspects of contemporary whaling are illustrated in Plate E.

On Cross Island, and for fall whaling in general, whales must usually be butchered on gravel beaches. Protecting the maktak (whale blubber and skin) and meat from dirt and grit is thus vital. On Cross Island this is accomplished by peeling off the maktak but leaving it attached to the whale until the internal organs and meat are taken off, as has been described in Table 4-7. The maktak protects the meat from the sand and gravel while the meat is placed in large plastic bags (perhaps "kitchen size"). The bags are either heavy duty or are doubled for strength. Eventually these bags, the maktak, and all other butchered products will be placed in large plastic fish totes or large specially corrugated cardboard boxes. The cardboard boxes are an experiment to replace the plastic totes and have been used since 2004. Some crews like them, as they are disposable

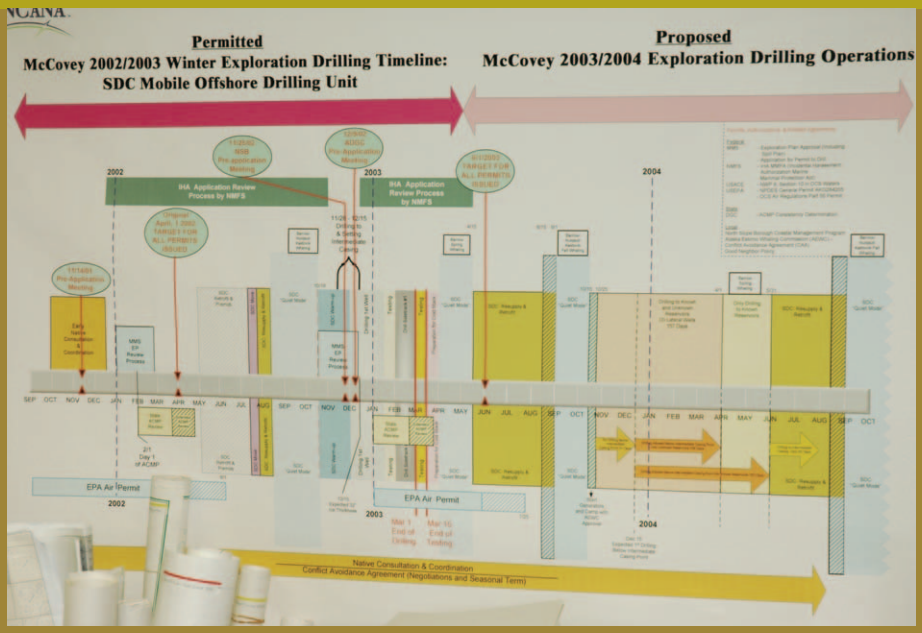
and thus less trouble than the plastic totes, which need to be cleaned before they are reused. Other crews think that the totes protect and preserve the harvest better, as they are more durable and waterproof than the boxes. The plastic totes are also preferred to pack whale (and other supplies and gear) transported to and from Nuiqsut on the whaling boats. Those organs that are taken (kidney, heart, intestines) are generally placed on the large plastic tops of a fish tote until they are processed and can be put into plastic bags. Once the strips have been cut into more manageable pieces and most of the blubber has been removed, maktak is placed in the totes or boxes. In most cases maktak is placed directly in the fish totes, but it is sometimes put into plastic bags before being stacked in one of the cardboard boxes, to reduce potential leakage. To the extent possible, maktak and meat are kept separate. Each crew puts its share in its own boxes. Often, crews will keep each whale separate, either in separate boxes or separated with plastic sheets if they are put together in the same box.

Some Nuiqsut boats still have compasses, but all now have some type of handheld GPS device and most crews know how to use such devices to follow past tracks in memory or to navigate to previously marked waypoints. While scouting, crews will commonly keep track of how far they are from Cross Island and some other point of interest (Narwhal Island or some other landmark) as a way of informing other boats where they are located. Boats communicate over VHF radios, which are installed in all boats by an NSB technician prior to the whaling season and removed soon thereafter. Most crews in fact have their own VHF radios, but this program ensures that all boats have communication ability and can keep in touch with both the WCC, each other, and the "home bases" on Cross Island. In the past, Nuiqsut whalers used CB radios, which had a shorter range and were not as reliable. Before CB radios, communication was much more difficult and the need to maintain visual contact with other boats was more critical.

Nuiqsut whalers pull whales up on the beach using a diesel-powered winch and/or a small loader, provided by the oil industry under the terms of the CAA. Small whales (25 feet or smaller) can generally be beached using only the loader. Whales up to 35 or 40 feet can be handled by the winch alone, and both will be used on larger whales, just in case. The loader is also a very important tool during butchering, compensating for a relatively small labor force with its mechanical advantage. Nuiqsut is not unique in this regard by any means—the other fall whaling villages (Barrow and Kaktovik) also use heavy equipment to aid their fall butchering tasks. The loader is used to provide tension when cutting large parts of the whale, to manipulate the whale to speed up the removal of internal organs and such, and to move and turn it over to speed up overall butchering. The loader also is used to move the massive amounts of butchered products and waste material to different parts of the beach and the waste disposal area, as well as for general support activities on the island. The latter can include providing "taxi" services, aiding in hazing polar bears, taking boats out of the water and putting them back in the water, moving trailers on the island, and a host of other activities.

While not usually classified as "whaling technology," Nuiqsut whalers also have the advantage of an electrical generator on Cross Island, along with large storage tanks for diesel fuel and gasoline provided as part of the CAA. These resources are taken for granted in most of the other whaling communities. Electricity may not be essential to the whaling effort, but it does much in terms of increasing comfort. More important is the reliable supply of gasoline for the boats and diesel fuel for the loader and heating the cabins.

Whaling Technology



Conflict Avoidance Agreement

Crew with harpoon

Whaling crews often use two boats

Traditional whale bomb

Nuiqsut\Kaktovik- Plate E

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4.3.5.4 Crew

The AEWC defines a "whaling crew" as "… those persons who participate directly in the harvest or attempted harvest of the bowhead whale and are under the supervision of a captain" (AEWC 1995:4). Section 4.3.5.2 above discusses "crew" in its more expansive meanings, but the AEWC definition corresponds very closely to the Nuiqsut category of those people who go out to Cross Island during the fall whaling season. These individuals are certainly regarded as the core and most active members of their respective whaling crews and will be the focus of this section. As discussed above, however, not all crew members always go out scouting for whales every time the crew's boat or boats go out scouting. There are many onshore tasks that need to be accomplished while the crews are on Cross Island, and all who contribute by assisting with these tasks are considered valuable crew members. In recent years, all captains but one have accompanied their crews to Cross Island. The one exception is a widowed elder who took over the crew from her husband, and whose crew consists primarily of several of her sons and other relatives. One of her sons serves as the acting captain on Cross Island. Perhaps half of Nuiqsut whaling captains are still of the age of the adults who originally resettled Nuiqsut, so that they were experienced whalers prior to whaling from Nuiqsut. The other half, while they may have first whaled in Barrow, have acquired most of their experience while whaling from Nuiqsut. The youngest whaling captain is in his 20s, another in his 30s, two in their 40s, one in his 50s, two in their 60s, and one in her 70s. Several retired or inactive whaling captains are elders.

The AEWC definition of crew must be distinguished from the idea of a "boat crew," since it is not uncommon for Nuiqsut whaling crews to consist of several boat crews, all under the supervision of a single captain. "Boat crew" is thus a subset or a part of a larger whaling crew. For this section, "whaling crew" refers to all those persons on Cross Island directly under the supervision of a whaling captain. Note that not all such persons will necessarily actively scout for or hunt whales on the water (especially if they are young), but all will help in butchering and other support activities and are important for the success of Cross Island whaling. "Boat crew" will refer to those persons who actually go out in a given boat on a given day and will generally be a subset of a whaling crew, even for those whaling crews with only one boat. Boat crews can, and do, vary from day to day, although they tend to be stable in at least the primary skill positions (driver and harpooner). The number and composition of the other people on a boat crew on a given day can be much more variable and are more variable for some Nuiqsut whaling crews than for others. Whaling crews also change over time, as people do sometimes leave or arrive at Cross Island separate from the rest of the crew. In recent years most Nuiqsut whaling crews have used more than one boat, although this was evidently not as common in the past when more whaling captains (and crews) were active.

In the 1990s, Nuiqsut had as many as 11 active whaling captains. Currently, there are fewer. Some captains who do not expect to go whaling do not register with the AEWC each year, and others have retired. In the last 5 years, an average of four crews have whaled from Cross Island, with perhaps a total of eight potentially active captains recognized by the community. When eight or more crews went out whaling there was little reason for captains to run multiple boats. However, when relatively few captains go whaling, crews generally use multiple boats in order to assist each other in chasing and towing a whale. Thus, even with an average of only four

crews during the last 5 years, there has been an average of about eight scouting boats per year (although some crews still only have a single boat).

The number of people who actually man each boat while whaling varies across whaling crews. Boat crew size can also differ from day to day. A Nuiqsut whaling boat normally requires a minimum of three crew members—a driver, a harpooner, and a person in charge of the float—although boats will sometimes go out with only two crew members. When a boat does go out with only two crew members, however, it always stays close to other boats and is never the "number one" boat for that whaling crew. Whalers indicate that a number of factors are considered in determining crew size. For example, when conditions are rough or more speed is required, a whaling captain will go out with fewer crew members in each boat. When conditions are optimal or when a captain wishes to act more in support of other boats rather than seek a first strike, he may take more crew members in a boat. Those boat crews with young (less than 16 years old) members not yet fully proficient in the skills required for whaling tend to be larger in order to facilitate the transmission of whaling knowledge.

When a crew has multiple boats, the captain's boat is the "number one" boat. Nuiqsut whaling captains typically serve as their boat's driver. The captain has primary responsibility for the safety of his crew. An important aspect of this is the experience and knowledge of how to approach a whale, and especially how to react to and withdraw from a struck whale that is potentially dangerous to the boat. Often, relatively inexperienced whalers are allowed to try to strike whales, with the explanation that harpooners have to learn sometime and experience is the best teacher. However, only those with experience or who had been part of a boat crew for several years are allowed to be drivers. The "float man" is the typical position for the person on the boat crew gaining experience and waiting to move up "to the front of the boat" as harpooner.

As is the case among Kaktovik crews, Nuiqsut crews are primarily kinship based, although some non-kin may be members. Given that most Nuiqsut residents are related in some way, crews differ primarily in the degree to which close kinship relationships exist between the captain and his crew members. For some crews, long-term friendships are clearly important for certain positions, but kinship relationships still provide a fundamental recruiting basis for the crew. Almost all captains explained that they do not need to recruit their crews. They have little turnover from year to year, except for people who move or need to stay in town for work or personal reasons.

4.3.5.5 Beliefs and Values about Whaling

See Section 4.1.5.7 for a brief summary of the beliefs and values about whaling that are shared among the NSB project communities.

4.3.6 Nexus of Whaling and OCS

Nuiqsut whalers in general face the same threats and opportunities regarding whaling and oil-related activities as described for Barrow and Kaktovik. However, Nuiqsut residents perceive themselves as surrounded by oil and gas development, with developed and/or developing fields to the east, north, and west of them. Moreover, industry interest in offshore exploration and

development in the Beaufort Sea is concentrated in the mid-Beaufort near Cross Island, Nuiqsut's whaling site. The Northstar development is visible from Cross Island at night, due to its flaring of gas, and when the rig was present on the McCovey prospect it was close enough to be seen from Cross Island. In addition to development in the immediate vicinity at Nuiqsut, undeveloped tracts under current lease to oil companies extend throughout NPRA, including those offered in the most recent lease sale around Teshekpuk Lake, as well as offshore tracts all along the Beaufort Sea coast from Barrow to the boundaries of ANWR, in both state and federal waters. The Oooguruk prospect, in Harrison Bay near Thetis Island (just east of the Colville River delta), is being developed by Pioneer Natural Resources. Kerr-McGee has plans to develop the Tuvaaq and Nikaitchuq units to the east of the Oooguruk unit. British Petroleum Exploration Alaska is once again reconsidering the Liberty offshore prospect. Aside from perceived pollution and health problems associated with oil and gas development, Nuiqsut residents cite the adverse effects this development has had on animal populations and behavior, with attendant effects on subsistence activities. For example, Nuiqsut whalers hold past seismic activities responsible for the failure to harvest whales in certain years.

On the other hand, the proximity of Nuiqsut residents to oil and gas development also provides them greater opportunities for employment in the petroleum industry or its support industries. Several residents of Nuiqsut currently work at the Alpine complex, and several others at the Prudhoe Bay/Kuparuk complexes. The Kuukpik Corporation is active in joint ventures with oil industry support companies, and Nuiqsut residents tend to be employed more in these activities than directly in the oil industry itself. Such activities would include the seasonal construction and maintenance of ice roads, wildlife monitoring, and work on contracted seismic crews. The Kuukpik Corporation is also the operator of the Kuukpik Hotel, which commonly is filled in the winter with oil industry employees from outside of Nuiqsut working on the ice road, any exploration programs going on, and/or active development projects. Shareholders of the Kuukpik Corporation also benefit from oil development on Kuukpik land and Kuukpik participation in oil support activities through receipt of corporate dividends.

In addition, as detailed above, Nuiqsut whalers have benefited from the CAA. The support supplied by industry under the CAA has reduced the logistical difficulties of whaling from Cross Island.

The Nuiqsut whaling captains interviewed during this study voiced strong opposition to the development of the Northstar project and all other offshore development. At this time, there is considerable uncertainty among Nuiqsut residents about how this development could affect whaling activities. Early Beaufort Sea lease sales included deferrals for Barrow, Nuiqsut, and Kaktovik whaling areas. The most recent 5-year plan, for 2002-2007, included three sales for the Beaufort Sea area—186, 195, and 202. The Barrow and Kaktovik whaling areas were deferred from consideration for leasing for sales 186 and 195 but not the Nuiqsut/Cross Island whaling area. Sale 202 is currently under consideration and could conceivably lease tracts in these previously deferred areas. The next 5-year plan, for 2007-2012, is currently under development and a draft has been issued for public comment (02/06). The draft does not include any Alaska deferral areas, although public comment strongly supported the continuation of the Barrow and Kaktovik whaling area deferrals and the reinstatement of the Nuiqsut/Cross Island deferral.

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SAVOONGA

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4.4 SAVOONGA

4.4.1 Background and History

St. Lawrence Island is located in the Bering Sea about 169 miles from Nome and less than 40 miles from the coast of Russia. The island has been inhabited for more than 2,000 years by the ancestors of the contemporary Siberian Yup'ik residents. Before a severe famine during the late 1800s, the island had a population of about 4,000 persons who lived in multiple villages on the coasts and small islands adjacent to the main island. One observer of this famine described it as follows:

> *The winter of 1879-80 was one of exceptional rigor in the Arctic … The ice closed in solid around St. Lawrence Island—so firm and unshaken by the giant leverage of wind and tide that all walrus were driven far to the southward and eastward beyond the reach of those unhappy inhabitants of that island, who thus unexpectedly deprived of their mainstay and support, seemed to have miserably starved to death, then with an exception of one small village on the north shore.* (Krupnik and Krutak 2002:261)

The population of St. Lawrence Island plunged to less than 500 individuals. As in quite a few other Alaska Native communities, reindeer were introduced about 1900 as one solution to the effects of prior famines. These herds grew and became a feature of social and economic life on St. Lawrence Island (Ackerman 1976).

The approximately 1,350 contemporary island residents live in two communities: Gambell and Savoonga. Savoonga is on the southeast coast of the island, about 40 miles from Gambell. Gambell is the older of the two communities; Savoonga grew from a reindeer herding camp established about 1916 to a village that incorporated in 1969.

Alaska Native residents of both Savoonga and Gambell belong to a distinct cultural group: Siberian Yup'ik. They speak a dialect that is one of three branches of the Yup'ik language group. Their language closely resembles the Yup'ik spoken among indigenous peoples of the Chukotka and Magadan regions of Russia, which is termed "Asiatic Eskimo" or "Siberian Yup'ik." Yup'ik residents of Chaplino, Anadyr, Providenija, and other Russian communities, who are occasional visitors to Gambell and Savoonga, communicate in their common language without difficulty. A St. Lawrence author describes the island's early settlements as follows:

> *Some years ago Siberian People sailed across to Seevookuk (Gambell) bringing fawn skins and dried reindeer meat to trade to the people on the island. In those days there were four villages on the island; one at Seevookuk, one about five miles east of where Savoonga is now; one at Southeast cape and one at the south end of the big lagoon on the south side of the island. … In those days there were 3,000 to 5,000 people estimated living on the island. This was all in four villages and a dozen other small camps, all Eskimo people.* (Silook and Malewotkuk 1976:16)

4.4.2 Community Characterization

Savoonga is a short flight from Nome, Alaska, but on a clear day almost any flight path provides a view of the proximity of the Russian coast to St. Lawrence Island. This island community has roots in the aboriginal cultures of the Russian coast and it is also a community clearly in the mainstream of a contemporary Alaska. History, culture, and kinship connect Savoonga to its past and the almost daily flights from Nome may be seen as symbolic of its present-day connections to a modernizing world.

Basic demographic information for Savoonga has been presented in Chapter 3 for the year 2000. Figures 4.4-1 and 4.4-2 display Savoonga's location on St. Lawrence Island, and its proximity to the northwest coast of Alaska and to Russia. Savoonga has an estimated population of 643 persons. The 2000 U.S. Census indicates a median age of about 25.5 years and roughly 50% of the population was less than 25 years of age. Approximately 8% of the population was over the age of 62. The 2000 U.S. Census indicates about 160 households. Enumeration of households for fieldwork in 2004 indicates about 200 households.

Savoonga is a second-class city in the Alaska municipal government system. Residents of Savoonga are represented by a mayor and city council. As with many other Alaska Native communities, Savoonga also has a Native government with a village council representing tribal members. As described in Chapter 3, Savoonga (and Gambell) residents chose a different route under ANCSA than did residents of the North Slope. As a result, local corporations do not play the same role in controlling land and other real assets as is seen in the NSB.

Most of the homes in the village are connected to sewer and electricity. Televisions and telephones appear to be common in most homes, with television services provided via satellite. There is also internet service available. Housing is composed of both older homes in the "old village" and newer homes constructed by the Bering Straits Housing Authority. The newer homes are in a subdivision to the north of the old village. Infrastructure is provided by local, regional, and Native institutions. Table 4-9 describes the array of facilities and services available in Savoonga.

Savoonga infrastructure includes an all weather airport serviced with frequent flights from Nome by several air carriers. Air cargo and mail service are also from Nome. Additionally, there is a barge service that brings fuel to the community to run generators and fuel vehicles as well as heat structures. Within the environs of the community there are cinder roads, and elevated boardwalks between houses. The Savoonga Health Service clinic provides routine health care services. Serious cases of illness or injuries are flown to hospital facilities in Nome or beyond. There is a larger village store and a smaller shop that provides snacks and a few essentials. A post office, school, volunteer fire department (VFD), and two churches are the remaining essentials of Savoonga's infrastructure. At the time of the fieldwork, a community center was under construction to provide a meeting place for villagers, who mostly gather in the VFD hall and school gymnasium for community events. Aspects of community characteristics and infrastructure are illustrated in Plate A and Plate B.

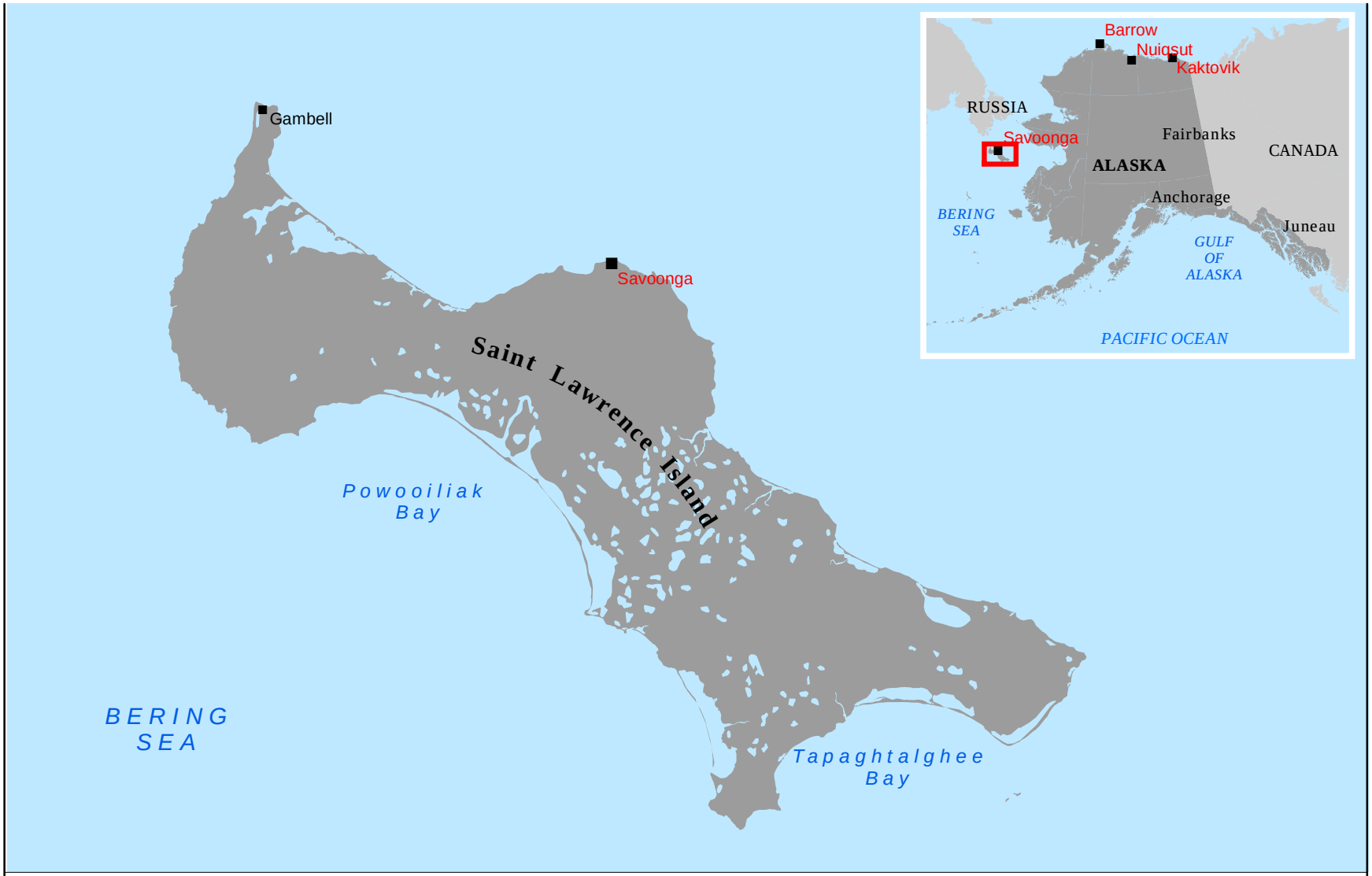

Figure 4.4-1
Savoonga
Regional Map

Source: Google Maps 2006

Figure 4.4-2
Savoogna
Village Map

Path: P:\2001\1K118 Bowhead Whaling\5GIS\Mxd\Village_Maps\Savoonga_google.mxd, 01/03/07, LeeJ

Community Characteristics

The Village of Savoonga

Savoonga Presbyterian Church

Village boardwalks

Sharing at community celebrations

Savoonga - Plate A

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Infrastructure

Water system

US Post Office

City government operations

IRA offices

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Table 4-9. Infrastructure Found in the Village of Savoonga

Regional/City Owned Infrastructure	Other Governmental Infrastructure	Non-Governmental Infrastructure
• Police Department and City Jail • Volunteer Fire Department • Savoonga First Responders/ Rescue Team • Water service and facilities • Sewage service and facilities • Landfill • 28,500-gallon fuel storage facility • Savoonga Health Service • Washeteria (laundromat) [no longer open] • Maintenance facility • Visitor lodging facility • Hogarth Kingeekuk Sr. Memorial High School (K-12) - Bering Straits School District • 149,500-gallon fuel storage - Bering Straits School District	• Army National Guard Armory • 7,500-gallon fuel storage (National Guard) • U.S. Post Office • 4,400-foot gravel airstrip owned by the State of Alaska • 9,500-gallon fuel storage - Alaska Department of Transportation • Grocery and shopping available from Alii Neui Shop, Savoonga Native Store (ANILCA & IRA) • Native Village Office • Garage (IRA) • EDA multi-purpose building (IRA) • IRA shop building • Old Health Clinic - Indian Health Service	• Electricity by the Alaska Village Electric Cooperative (AVEC) • 136,200-gallon fuel storage facility - AVEC • Two churches: Seventh Day Adventist and Presbyterian Church • 5,900-gallon fuel storage facility - Presbyterian Church • Local telephone service provided by United Utilities Inc. • Lodging provided by Alowa's Lodging and Yugni • 279,000-gallon fuel storage - Village Store

The major form of transportation during the non-winter months is via four-wheel ATVs, bicycles, and walking. There were two automobiles in the village during fieldwork (2004). Villagers also use powerboats to travel to summer camps and to hunting and fishing locations during these months. In the wintertime, snowmobiles (also known as snow machines) are used as the major form of transport around the village and between Savoonga and Gambell.

4.4.3 Subsistence and Cash Economy

4.4.3.1 Employment and Labor

Savoonga is a community with a high unemployment rate (37.6%), limited participation in the workforce (~35%), and a relatively high percentage of persons below the federal poverty level (~29%). The potential, if limited, sources of employment in 2004 included:

- City
- IRA Council and associated programs
- Norton Sound Health
- Bering Straits School District
- Post Office
- Native Village Store
- East Cape cleanup

Other sources of income include the Permanent Fund distribution, ivory carving and other artistic and craft production, and selling artifacts. Ivory and whale bone carving has a long history on St. Lawrence Island. Contemporary residents have continued this art form and many are well known for the quality of their carvings. There are some full-time carvers who sell primarily to off-island markets and buyers. Many residents carve to sell to tourists who visit Savoonga or to shops in Nome and elsewhere. In addition to ivory carving, some residents produce dolls and other arts and crafts for sale on and off the island. Savoonga residents also collect artifacts, often ivory and bone carvings, that are also sold locally to tourists, but more often to off-island buyers. Participants in this work describe private buyers who visit Savoonga once or twice a year from New York and other U.S. mainland cities to buy these artifacts. These items are usually collected during the summer months when village residents are "camping" near locations that were once historic habitation sites. Digging for these artifacts is both a recreational past-time during "camping" season as well as a means to acquire artifacts to sell to tourists and professional buyers.

Tourism is also a growing source of income for Savoonga residents. It provides income to those with houses to rent, to local artists and craft persons, as well as to the City of Savoonga and others who provide other services to tourism visitors. Birders have been common visitors to St. Lawrence Island because of the large populations of auklets and other sea birds as well as geese, warblers, raptors, and a variety of other migrating species. More recently, cruise ship companies have initiated onshore tours to Savoonga and Gambell. Plate C displays the artistry of carving as part of the cash economy of Savoonga and illustrates a few other income-producing opportunities.

During fieldwork for this project a cruise ship anchored offshore and landed approximately 75 to 100 passengers who were treated to a presentation by villagers. The presentation began with several hymns and traditional songs sung by women elders from the village. A presentation was then made by several male elders about whaling, including showing the harpoons, shoulder guns, and "bombs" used in whaling. A miniature boat and floats were also used to demonstrate the process of approaching and striking the whale. Visitors then asked questions of the presenters using a local translator. After the presentation, local ivory carvers offered items for sale to the tourist visitors. One local ivory carver commented before this visit:

> *I have been up carving for a couple of days getting ready for the cruise ship. I can do really well when they come in if I have enough carvings for them to choose from. It can make a big difference for how much I have to carve the rest of the year. I might be able to trade some ivory for some binoculars. That would really help during walrus season.*

The Native Village also maintains a herd of reindeer that provides some economic benefit to village residents. The Native Village employs a Chief Herder and Assistant Herder and occasional wranglers. Historically, the herd had almost 10,000 animals, although currently it is about 3,000. The animals are rounded up in the spring when they are de-antlered, castrated, and counted. Usually in July, the Native Village issues a permit to families who wish to harvest a reindeer. The permit costs about 100 dollars. An average yield from these animals is about 200 pounds of meat. Along with walrus, whale, seal, and other subsistence foods, reindeer meat is an important food source for Savoonga residents. In fact, subsistence is a fundamentally important

Labor and Wage Economy

Local artist's carving

Local carver

Community event for cruise ship passengers; includes carving sales

ANICA grocery store

Savoonga - Plate C

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element of a mixed economy in which year-round or seasonal employment and/or income from carving and other crafts provides the cash resources required for a range of modern conveniences and necessities.

4.4.3.2 Subsistence Culture and Community

The Siberian Yup'ik of St. Lawrence Island share some history and cultural traditions with their Iñupiaq neighbors, including hunting of marine mammals; the practice of a subsistence lifestyle; and experiences with famine and the effects of contact with Russian, American, and other non-Native explorers and whalers. These shared traditions coexist with some important distinctions between these two cultural groups. For example, Iñupiat and Siberian Yup'ik are two distinct languages and there are also differences in traditional religious beliefs, kinship, social organization, and material culture. Similarly, Savoonga residents are islanders while the Iñupiat are primarily mainlanders in their ecological niches. For the purposes of this discussion, the importance of subsistence lifestyles and the traditions and beliefs about whale hunting constitute shared characteristics that potentially influence beliefs and values about offshore oil development and its effects on whaling and other subsistence activities.

Savoonga has a strong cultural identity as a Siberian Yup'ik community with connections to their Russian relatives. There is a history of visitation, even in historical times when there were political tensions between the United States and what was then the Soviet Union, that continues today. For example, during fieldwork for this project, a group of traditional dancers from Russia was visiting Savoonga.

Savoonga also identifies itself as a subsistence hunting community, especially hunting for whales and walrus. Savoonga is known as "The Walrus Capital of the World." Walrus are an important food source and the tusks are the primary medium for carving. Similarly, the traditional boats for whaling are made from split walrus skins, in contrast to the North Slope communities that use ugruk skins to cover their traditional boats. The prominence of the walrus in the physical environment and culture of Savoonga is an important and distinguishing characteristic of this community. Yet, a range of subsistence activities structures time and the activities of village residents. The seasonal cycle of subsistence activities, discussed below, is thus another distinguishing characteristic that contributes to the identity of this community.

There are some normative beliefs that are components of the world view among village residents, including an emphasis on sharing, kinship, and religion. Sharing is one of the essential values espoused by Savoonga residents. Sharing is practiced among kinsmen, but it is also a more widely held value that applies to those in need within the village. Subsistence foods are the primary food items shared, although there is some limited sharing of cash in the form of "Eskimo loans" or loans/gifts that are not repaid. However, participants in this project emphasized the sharing of subsistence resources as a primary value in this culture. When one villager was asked to estimate the amount of food shared, she replied:

> *We don't keep track of amounts. We share in "some" amounts: "some" to my sister, "some" to another relative. Sharing is what we are all about.*

This sharing ensures the continuity between generations and assumes a role of caretaking for the younger generation to provide food for their elders and those who are not able to hunt for themselves. Residents interviewed during this study also suggested other norms about sharing:

> *The first walrus of the season after a long winter, we will usually give it all away. It is the joy of sharing the first meat of the season and we may not keep any of it.*
>
> *We have some rules for sharing. For example, if someone shoots a seal and it washes up the first day, then it is his. If it the next day, then it is who finds it.*
>
> *Even if you are not on a crew, you get a share of whale. If someone gets a whale then the share will be distributed to the whaling captains and then they distribute it to their crews.*

These different examples suggest the overall importance of sharing as a value in this culture. This value is also consistent with the demands on social organization from harsh ecological environments. This consistency of social organization, cultural beliefs and practices, and ecological context contributes to the overall adaptability of St. Lawrence Island culture (cf. Geertz 1973).

Fieldwork for this project as well as other published ethnographic data indicate that kinship and family are important values that influence behaviors such as sharing and patterns of association, including the composition of whaling crews (Moore 1923; Hughes 1960; Ackerman 1976; Jolles 2002). One participant in this study made the following observation about the significance of family and kinship in Savoonga:

> *My husband was born here, but I am from* [near Nome]*. When I first moved here they called me "mainlander." You had to prove yourself to be accepted. You had to prove your value by understanding traditional ways of doing things here, gathering and preparing foods, and supporting the hunters. … It was also important to share with other family members and to have good relations with your family. My husband's mother, God rest her soul, always said to us that family was the most important thing.*

As in other Eskimo societies, elders are respected and they are expected to provide advice and guidance to younger persons and anyone who needs the knowledge and wisdom held by them.

Historically, religion has been a significant component of Siberian Yup'ik life (e.g., Lantis 1938, 1947; Silook and Malewotkuk 1976; Fitzhugh and Kaplan 1982; Kawagley 1995). After contact with outside cultures, missionaries began to visit the island, the first arriving about 1887. The village of Gambell is named after the Presbyterian minister Vene Gambell. Vene Gambell and the Reverends Sheldon Jackson and William Doty were among the first resident missionaries on St. Lawrence Island (Krupnik and Krutak 2002). Conversion to Christianity was common and today most Savoonga residents are Christians. Religion and spirituality continue to be important values among village residents as expressed in the following statement by an individual interviewed in this study:

My parents were devout people. We were taught the same way. I think the people of Savoonga are a very spiritual people. Maybe people don't go to church as much as they should, but we are believers and it is part of who we are. If you go whaling, you believe.

In contemporary Savoonga, the Presbyterian Church continues to have a presence and the spiritual traditions of both Gambell and Savoonga continue to have importance in the daily life of these islanders (cf. Jolles 2002).

4.4.3.3 Patterns of Change and Contemporary Issues

The operation of an Air Force Base at the Northeast Cape on St. Lawrence Island from 1952 to 1972 provided employment opportunities for Savoonga residents. However, after the base was decommissioned, evidence of environmental contamination was discovered. Some 23 sites have been identified as containing contaminants, including heavy metals, dioxins, asbestos, and polychlorinated biphenyls (PCBs). Residents report ongoing concern about the health effects of exposure to these contaminants, especially PCBs, as well as the potential effects on subsistence resources and the St. Lawrence Island ecosystem. The potential for adverse health effects is expressed by one study interviewee:

In the mid 1960s the DOD [Department of Defense] *did not know about PCBs and asbestos. But we are getting the effects from it. Is it airborne? Is it in the water? Is it in the animals we eat? Maybe it is from all those sources! Our people are dying from cancer, liver and kidney problems, leukemia, and diabetes. Where is it coming from? Why are so many people dying from these diseases? We think we know where it came from* [Air Force base] *and we are trying to get some studies done to help us out.*

Climate change was also identified by study participants as among the most important concerns of island residents. Savoonga residents report changes in the length and intensity of different seasons, poor ice conditions for subsistence hunting, and other weather and climate changes (cf. Oozeva et al. 2004). Changes in ice condition, especially important for subsistence hunting, were noted as among the most noticeable environmental changes:

I would like to talk about our ice. It has changed from since I became aware of things long ago. Over the past 45 or more years, from change caused by wind, our ice is getting thinner and there are more ridges and the pieces are getting smaller. It has changed from long ago when we used to hunt by foot on the ice because of increasing winds. That is how it has become, and it may be getting thinner and easier to melt. Maybe the current from far south has started to get around the island.

Our permafrost is melting and the ocean is rising. The permafrost melting is probably making the sea level increase. The bluffs are falling all around the island. I do not know why it is happening that way. (Oozeva et al. 2004: 93)

Participants identified modernization and the potential "culture loss" among island young people as an ongoing concern. Study participants indicated that younger people speak English more than their traditional language and are losing traditional knowledge as a result. For example, a Savoonga male noted:

> *We sit around in the store in the mornings and have coffee. Some of the elders come in from time to time. We were talking one morning about ice and they were using words for different types of ice conditions that I have never heard. That shows you we are losing our ways and we need to teach our children those ways and help them with our language.*

Population growth was cited by some older villagers as a notable change, especially the increase in the population of young people in the village. These participants worried whether the amount of subsistence resources available was sufficient to support the growing population. Residents also expressed concern about the regulation of traditional subsistence activities by outside agencies. The U.S. Fish and Wildlife Service monitoring of walrus hunting and the restrictions on whaling imposed by the IWC were noted restrictions on traditional subsistence activities. In addition, residents indicated that the increasing noise in the vicinity of Savoonga from airplanes, snow machines, power boats, and other sources could have potential adverse effects on subsistence hunting. Despite these various concerns, however, there was an expression of overall satisfaction with the subsistence lifestyle within the village; in particular, residents accept the trade-off of low income and limited employment for living the subsistence lifestyle offered by the village.

4.4.4 Community and Whaling

Contemporary Savoonga residents began whaling in the early 1970s, but whale hunting is an ancient activity in Siberian Yup'ik culture in general (Fitzhugh and Kaplan 1982; Fitzhugh and Crowell 1988; Krupnik 1993; Bandi 1995); it also has a long history on St. Lawrence Island in particular (Geist and Rainey et al. 1937). The historical and contemporary practice of whaling in Siberian Yup'ik culture suggests that knowledge to develop whaling implements, hunting practices, and the butchering and the sharing of whale products is distributed among families and individuals. Successful whaling requires the organization and application of this knowledge by individuals with different social identities and status (e.g., male, female, elders, and youth). In this sense, whaling is a communal activity that expresses the bonds of community and also reinforces those bonds in its practice. This is well expressed in the response of one Savoonga whaling captain to questions about the importance of whaling for the village:

> *Even if you are not the one who gets the whale you are happy. When it is time to get your share and they call your name, you get your share and then you take it home and you share it with your crew and your family. Just like any society, you provide for your family and community. … If you cannot whale or you do not get a whale, then you do not feel like a total person and you are not happy. There is no happiness. There are certain realms to a good life. There is the spiritual side. There is the cultural side and the economic side, feeding your family, crew, and the whole community. You get that satisfaction when you can do that. You become a true person when you have all those things that fit together. …*

The whole thing about camaraderie gets brought out in whaling, not just among the whaling captains and crew, but the whole community. You find out who will help you out and who you can trust. I have never seen so much camaraderie as happens during whaling. That is when the village is happy. When I look around [after a whale has been taken]*, people are so happy. It is about people working together and coming together and being happy. It does not happen every year, but it does when we have a whale.*

(Interviewer) How do people in the community feel during years when there is no whale taken?

There is a lot more anxiety. A portion of that happy feeling is gone. … It is made even worse by global warming, because sometimes you can't go because of weather and ice conditions. And then people feel stress and anxiety. I think that part is never realized by people [outside]*, how the stress happens when we cannot hunt whales. You just feel like you are not truly complete. The whole community feels that stress too. People are not as congenial. Everyone knows there is a certain part missing. … It is like a death in the family. You are pretty bummed out for awhile. It is a community thing. It bonds people together.*

When people sit down at the table and share maktak, people talk and tell stories. You feel good about participating in what you are eating. Before you eat, you are always praying to God and giving thanks for the wonderful opportunity we have to whale.

The experience of community and individual "happiness" in response to whaling can be interpreted as a type of "optimal experience" (Csikszentmihalyi 1990). This experience is a consequence of the continuity between activity (whaling and sharing) and awareness (values and beliefs about whaling). The result is the experience of social harmony and the fulfillment of expectations about the values of Siberian Yup'ik social life and culture. Similarly, when a whale is not taken, this whaling captain suggests he and others experience anxiety and stress and perceive there is a "missing part" to community and personal well-being. That is, there is an experience of the discontinuity of activity and awareness that results in both social and psychological distress. From this perspective, whaling and community are more than optional activities of a Native people in a modern world. Whaling and the subsistence lifestyle sustain a sense of community and individual well-being. It can be hypothesized that the institution of whaling (beliefs, values, and socially integrative activities) assists Savoonga residents to cope with a variety of life stressors, including those related to acculturation (Boyer et al. 1989; cf. Dressler 1991).

4.4.4.1 The Cultural Context: Seasonal Round

The reliance on subsistence foods is one of the essential characteristics of the culture and lifestyles of Savoonga residents. Marine mammals, particularly bowhead whales, seals, and walrus, are the primary sources of protein, supplemented by a variety of other wild foods that are hunted and gathered by village residents. Store-bought foods are a part of local diets, but these

foods are expensive. For example, at the time of fieldwork in the summer of 2004, the prices for the following foods were recorded:

1 pound of butter	$5.95
1 dozen eggs	$4.50
2-pound block of cheese	$10.45
5 pounds of sugar	$10.95
1 can of Campbell's soup	$2.50

Residents also believe store-bought foods do not have the same nutritional benefits as subsistence foods. In fact, some residents interviewed during this study described both a physiological and psychological "craving" for subsistence foods. For example, one individual stated:

> *My family likes to eat walrus meat. It is food that will stay with you. It is not like store bought food. When I don't have it* [Native food] *for awhile, I start to crave it. I can feel it in my body and I feel unsatisfied. It is hard to describe it, but western food is unsatisfying. Walrus and whale and other Native foods, they stay with you and make you feel strong and healthy.*

A whaling captain made a similar observation:

> *Every year when whaling season comes around I start to crave the meat. I can taste it before I ever eat it. The whale, the seal, the walrus are the healthiest for your heart. They don't thicken in your blood like pork, chicken, and cow and block all your arteries.*

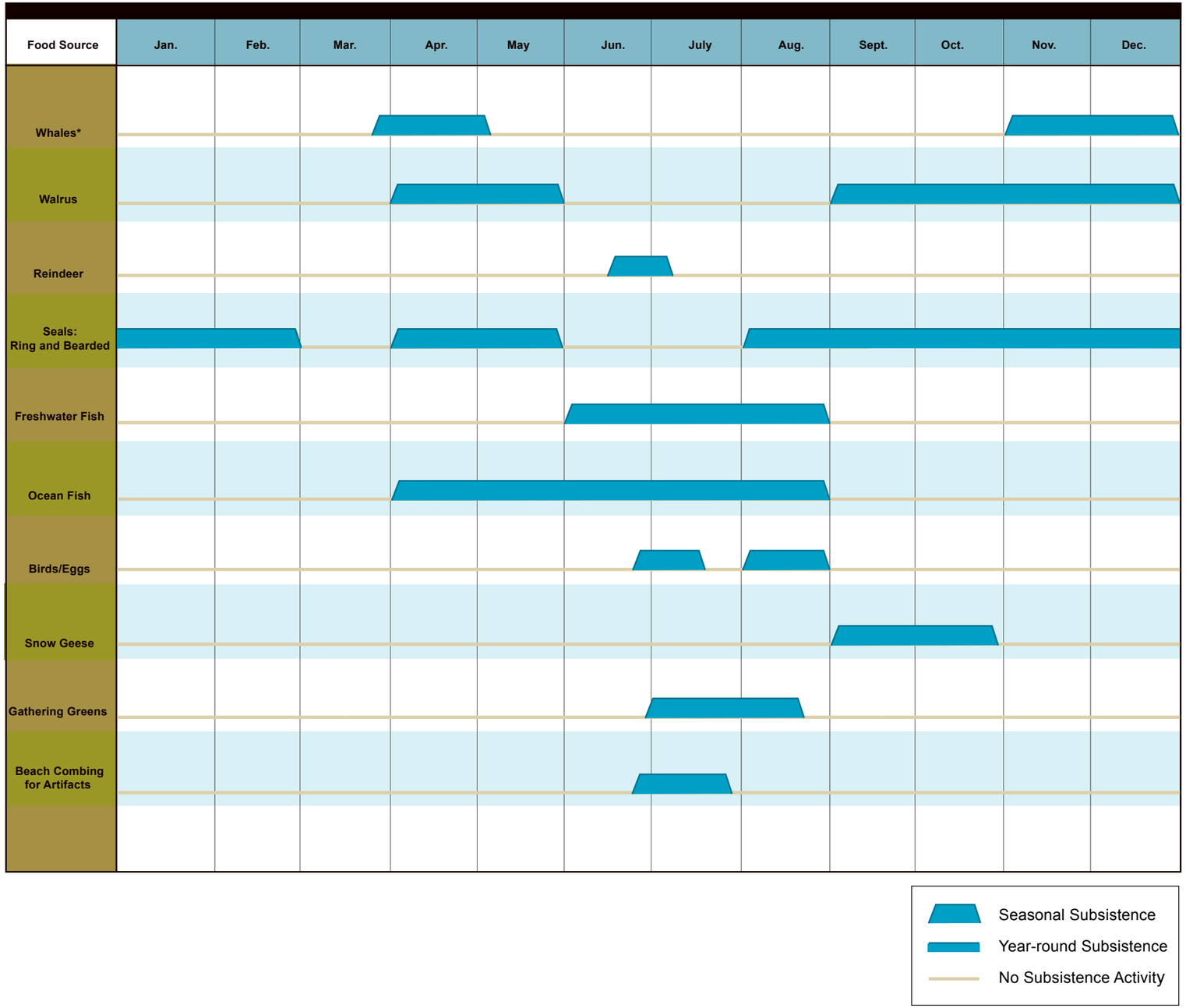
The overall importance of subsistence was succinctly summed up by one Savoonga resident in the most basic terms:

> *You want to know how important subsistence is? Well, I can tell you I live it, I breathe it, I eat it, I crap and fart it. Hunting is part of my family past. It is part of my children's future, God willing. I hope my grandchildren will make good choices and protect our subsistence resources.*

As noted by observers of the culture and social life of St. Lawrence Island (Jolles 2002) as well as the resident scholars of the island (Apassingok et al. 1985; Apassingok et al. 1987; Apassingok et al. 1989), the cycle of subsistence activities structures the patterns of life in Savoonga. Most participants in this study began their accounts of the general pattern of subsistence activities with the spring whale and walrus hunts. A graphic representation of the subsistence calendar is found in Figure 4.4-3. A composite seasonal round is as follows:

- The spring whale hunt often begins in late March, depending on weather and ice conditions. More predictably, April is the month for whaling and it can extend into early May. Skin boats are used and whales are hunted on the western side of the island some 40 or so miles from the village. Snow machines are used to transport people and gear to whale camp.

Savoonga Subsistence Time-line



NOTES:

Locations for whaling in spring and fall are different.

* **Spring Whaling**
  During late March through early May (peak by April), whalers travel by snow machine to the south side of the island, 40 miles from the village.

* **Fall Whaling**
  Fall whaling occurs closer to the village from late November to December.

This chart is a graphical representation of an idealized annual subsistence activities calendar. It is intended to portray seasons of greater or lesser subsistence activity related to particular species or species groups, but it does not attempt to show varying levels of effort within active seasons or compare levels of effort across different species or activities.

Sources: Galginaitis et al. 2001
Ethnographic Field Notes 2004
ADF&G Community Profile Database

Figure 4.4-3
Subsistence Hunting Calendar for Savoonga

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  - April and May are also months for hunting walrus and seal, again depending on ice conditions.
  - There is also fishing during these months for tom cod, blue cod, and rockfish.

- In June reindeer are herded up, the antlers are removed for sale to foreign markets, mostly Korean, and then most of the males are castrated.
  - "Greens" are gathered in the summer and boiled, sometimes with seal oil. Several varieties of roots are also gathered and preserved.
  - In the summer months there is also fishing for Dolly Varden, grayling (usually at camp), halibut, and some salmon (primarily humpback or pink salmon).
  - During late June and early July bird eggs are also gathered from the rookeries that are both nearby and distant from the village. Murre eggs are especially valued, but auklet eggs are also gathered. The auklet eggs are usually boiled while the murre eggs can be eaten in various ways.

- By late June and early July residents begin to go to their summer camps where they fish, engage in beach combing for ivory and other items, and also hunt for artifacts to sell. Some camps are toward the East Cape some 30 or 40 miles from the village while others are close by.
  - Before and during camping season, residents also beach comb for sea plants and other foods that wash ashore such as dead seals or the occasional minke or grey whale.
  - Residents return from camp in the early fall. Most have returned before October.

- Freeze-up usually begins in August. Northeast winds are prevalent during this time. Hunters will go out in their boats, make blinds, and hunt for ring and bearded seal.
  - Hunting for sea birds such as young gulls, cormorants, brandt, and emperor geese occurs during this time also.
  - By September and into October there is hunting for snow geese.
  - Some also fish for char, whitefish, and grayling in the time just before freeze-up, although jigging and floats are used for fishing after freeze-up occurs.

- Walrus hunting and whaling occur during November and December. Whaling is conducted near Savoonga on the eastern side of the island using metal Lund boats. The whales are beached in a small bay just northeast of the village.

- During the winter months, walrus, bearded seal, and ring seal hunting occurs as well as preparation for the spring whale hunt.

Plate D demonstrates a variety of subsistence-dependent activities including fishing, whaling (skin boat frame), gathering greens in the summer (an important source of vitamins), and preparing walrus meat.

4.4.4.2 Whaling Crew and Non-whaling Crew Participation

While walrus and seal hunting are more visible subsistence activities in Savoonga, the ethos of the community revolves around whaling. Whaling contributes food to the freezers of village

residents and satisfies their cravings for wild foods. It also is an expression of the continuity of community social life and cultural values. An elder whaling captain made the following comment about whaling activities in the village:

> *We have been whaling since time immemorial. My ancestors were whalers. My father was a whaler and my son is a whaler and his sons will be whalers.*

In response to a follow-up question about the history of Savoonga whaling beginning in the early 1970s, this whaling captain responded:

> *That is when we began again. We never stopped whaling in our hearts.*

These comments express the sense of cultural continuity about whaling as an activity that goes into an "ancient" time and will continue into a distant future. While Savoonga residents did not begin whaling from their own village before 1970, the whaling captain quoted above indicates that Savoonga residents regularly engaged in whaling with their Gambell relatives:

> *When I was a small boy we went to Gambell to whale. My brother had a crew and we went to Gambell to hunt whales. There was a lot of ice then. We started on fall whaling around October or November when the whales were going east. We had little equipment at that time because it cost too much. But, all the whaling for us in Gambell was with relatives. I whaled all the time I was growing up. I was told that it was Eskimo law that you follow the elders and listen to them. When I was young we listened to how they told us to whale. They taught us how to use the harpoon and the shoulder gun. They showed us how to make our floats from big ring seals. The elders also taught us to kill the whale quickly. It should not suffer. It is very important to kill the whale right away or they go into the ice and you lose them. They taught us those things.*

This account suggests that the values and practices about whaling were taught by elders in Gambell as well as in Savoonga. Another whaling captain also recounted the history of his family as whalers:

> *One of my relatives wanted to go back to Southwest Cape and go whaling there. He and his close kin decided to go back to Southwest Cape, but he could not get his equipment there. It was too far to travel, forty miles southwest of here.*
>
> *We used to hear about numerous whales that migrated past Southwest Cape in the spring. … Our family had whaled there for centuries before that, but when the Yankee whalers came, they depleted the resources. … Then in 1878 to 1880 there was massive starvation and people moved to Gambell. We whaled with the Gambell people. But whaling was an ancient activity for my people and it has been carried on for generations. You can see that by the number and the variety of whale bones around the old village sites, not only bowhead but grey whale too.*

Subsistence

Getting ready to go fishing

Skin boat frame

Drying walrus meat in the sun

Location for gathering greens

Savoonga - Plate D

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When a younger whaling captain was asked why Savoonga residents did not whale from their own village before the early 1970s, he replied:

> *Some of it was logistics. We could not ferry equipment across the island without modern motorized equipment that now saves us a tremendous amount of time and energy. … It was also very hard to pull boats across thick ice that could damage the skins* [used to cover the exterior of the boat]*. It was a big problem.*

Villagers interviewed for this project as well as published literature attribute the resurgence of Savoonga whaling to Nathan Noongwook who described his 1972 whaling trip to Southwest Cape as follows:

> *There had been no place for the Savoonga people to hunt whales. Now there is a place. The only problem that came up was when the white man tried to cut off our food supply, our whaling* [through the IWC quota system].
>
> *So that was the year I got whaling started. That year we tried hunting with our outboard motor, but we couldn't get close to a whale. … That year though we did get a whale right then and there. … The next year some of the others who went down with us also got whales.* (Apassingok et al. 1987:35)

Between 1972 and about 1990, whaling by Savoonga residents occurred primarily on the southwestern side of the island where spring whaling is currently practiced. By 1990, whales began to appear off the coast of Savoonga proper and villagers began to hunt them from Thanksgiving through December during what is referred to as the fall whaling season. For the fall hunt, whalers use aluminum boats, whereas walrus skin boats are used for the spring hunt on the south and west side of the island. Snow machines are used to transport the boats and whaling gear across the island to the spring whaling camps.

As in times past, the taking of a whale is cause for celebration by the whole village (cf. Silook and Malewotkuk 1976; Carius 1979; Jolles 2002). One whaling captain described a community celebration as follows:

> *We sing songs of celebration about the hunt and whaling. It keeps the traditions alive and it connects us with our ancestors. We associate that lifestyle of hunting whales with our ancestors. When you sing that song it is making that tie. When we dance too, it connects us to whaling. Some of the dances and the songs were created by our ancestors. Singing and dancing connects us to our ancestors. It helps us to prepare for the spring hunt.*

Within the village the whale is widely shared with elders, family, and crew members. Participants in this study also indicated that they share whale meat with relatives in Gambell and those who live on the mainland:

> *My sister lives in Nome. I always hear from her around whaling time. She wants to know what is going on and how the captains are doing. When we get a whale,*

we share it with her. She can't wait to get her share. She craves it as much as we do, even though she does not live here. It makes me feel good to share it with her. It connects us.

Whaling also requires the participation of diverse community members who participate in activities such as:

- Hunting walrus for the skin boat exterior,
- Preparing and splitting the walrus hide,
- Constructing the skin boat,
- Preparing the boat and equipment for whaling, and
- Butchering and distributing the whale.

There is also communal support for whaling. For example, the local store offers discounts to whaling captains for supplies, and the weekly bingo games provide funds given to the whaling captains to defer the costs of equipment and supplies. In this sense whaling and the sharing of the proceeds from the hunt is a pattern of beliefs and activities that connect individuals and family with their neighbors. As one Savoonga resident interviewed during this study stated:

There is a spiritual connection between the whale and us. When we take a whale and bring it back to share it, we give it away, all away. There is just a feeling you get like no other in the world when you are feeding all those people. It gives me goose bumps to think about it. That is the spiritual connection we have with our subsistence way of life.

4.4.4.3 Whaling Technology

The technology for hunting whales includes the boats to transport hunters, the hunting tools to dispatch the whale, methods of retrieval, and butchering. Plates D and E illustrate some of the whaling technology currently used in Savoonga. The boats for hunting whales are both metal Lund boats used primarily for fall whaling and walrus hide skin boats used primarily for spring whaling. The Lund boats (aluminum runabouts) are typically about 17 feet in length and have crews ranging from three to five and sometimes more persons.

The skin boats have wooden frames (Plate D) and are covered with a split walrus hide and sewn with sinew "thread" braided together and made from the tendons of gray whales (Plate E). The following passage describes how these boats have traditionally been constructed:

After the boat was framed it was painted with seal or whale oil to keep it from drying out. This they do while they are waiting for the walrus hides to soak. They soak for about a week. The skin for the boat is from walrus hide which is split in half because it is so thick. They split these hides beginning from the neck all the way down and leave only about two inches uncut to keep them together.

Whaling Technology

Handmade harpoon tip

Walrus skin used to cover skin boats

Thread made from sinew used to sew skin boat cover

Whaling boat and cover

Savoonga - Plate E

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> *When the hides are ready to use they put the boat frame upside down and put the skins on top of the frame and cut them up and get them into shape with an inch overlap at every joint. They make two stitches in every section. The seams are hidden in between the skin. This way the seams lasted as long as the skin itself.* (Silook and Malewotkuk 1976:2)

Whaling crews and their supporters continue to dry and split walrus hides and women sew these into the coverings for the village's whaling fleet. This remains a labor-intensive and highly skilled activity. A Savoonga skin boat seamstress interviewed during this study noted:

> *A hide can last about a year. The more you use it the longer it lasts! If you don't use it, then the seams will separate.*

Whaling captains stated these boats range in length from 22 to 28 feet, with an average boat about 25 feet in length. Some whaling captains indicated that Gambell skin boats averaged about 30 feet (cf. Ellanna 1983b; Braund 1988a). Crews can range from three to eight or more persons. Sails are commonly used on Savoonga skin boats as a means to travel quietly and efficiently. Historically, these sails were made from walrus stomach, but walrus stomach has given way to canvas for sail material. These boats are also typically equipped with small outboard motors operated by an "engineer" crewman.

As do whalers in the other AEWC whaling communities, Savoonga whalers use a shoulder or darting gun, harpoons, and "bombs" or explosive devices for taking the whale. Once taken and towed to shore, whales are butchered with a variety of short and long lances that are used to cut the outer layer of skin into strips. The meat is then cut using a variety of lances, knives, and other cutting implements.

4.4.4.4 Crew

The concept of a "whaling crew" in Savoonga is similar to that of crews in the communities of Barrow, Kaktovik, and Nuiqsut. A crew consists of more persons than those who man the boats, although these individuals are the heart of the crew. The broader concept of a "whaling crew" can be conceptualized as three concentric circles with the innermost circle being the boat crew. The next circle consists of kinsmen and friends providing direct support in activities such as sewing skins for the boat covering, assisting in preparing foods and hauling items to camp, and cooking at camp. The outer circle consists of community members and kinsmen who provide financial support, assist in butchering, and otherwise support whaling at a broader social level. A whaling crew expresses the connections of individuals within the community and their integration into cooperative networks to accomplish a goal for community as well as crew benefit.

There are about 30 registered whaling captains in Savoonga. "The number one rule is safety" was a common response by whaling captains to questions about the responsibilities of whaling captains. Similarly, when one young whaling captain was asked about his first thoughts when he became a captain he responded:

> *I first thought about responsibility to my crew and safety most of all. You have to think about if you are qualified to protect your crew. It took considerable consideration. I had a lot of support, so I went ahead.*

Weather, currents, and ice conditions were cited as among the most significant risks experienced by whaling crews. These pose risks for whalers that require a captain to have thorough knowledge of these topics in order to protect the safety of his crew. Yet, it is the unpredictability of ice, currents, and weather that whaling captains perceive as problematic (cf. Oozeva et al. 2004). One captain made the following observation:

> *There is massive ice out there and the wind can be unpredictable. The wind can shift very fast. In the winter the prevailing winds are from the northeast and they can shift very quickly. You can get trapped out there because the wind shifts.*

Whaling captains have an association to train and assist in the outfitting of whaling crews. Skin boat crews tend to be larger because of the need for paddlers and Lund boat crews are smaller because of boat size. Common roles in a skin boat crew include the following:

- Captain. The captain is responsible for outfitting the boat and all preparations for whaling. Most captains are men, although there is one female captain in Savoonga. The captain directs whaling activities and ensures the safety of the crew.
- Striker. The striker mans the harpoons and other implements for taking the whale.
- Engineer. The engineer operates the boat motor and is responsible for engine maintenance.
- Lookout. The lookout's primary function is to watch for blows, wakes, and other signs of whales. Lookouts may also be float men, depending on boat and crew size.
- Float man. The float man is responsible for ensuring the float lines enter the water safely after a whale has been struck.
- Paddlers. Skin boat crews may have designated paddlers who may also perform other duties such as assisting with sails or floats.
- Boyer. Usually a young whaler in training, the boyer assists in bailing water, taking directions from the captain, and going for supplies that are needed by the crew.

Fall Lund boat crews have three primary roles: The captain, the striker, and the float man. The size of a Lund boat does not often allow for much larger crews than three to four persons. The Lund boats are used in the fall because they are faster and they are safer during this time of year. Lund boats allow crews to avoid the fast moving ice at this time of year and the low light that might require crews to travel to shore quickly.

When whaling captains were asked about the social identity of the crew members, a common reply was that "anyone can join." This expresses the normative value about whaling as a community activity in which everyone participates. Historical records (Krupnik and Krutak 2002:343-361), ethnographic research (Hughes 1960; Ackerman 1976; Ellana 1983b; Jolles

2002), and information gathered during this study suggest whaling crews consist primarily of close kinsmen. However, some crews include non-kinsmen, especially when there is a need for a special expertise or when kinsmen may not be available. The following are examples of the identified kinship relationships on several Savoonga boat crews with captains of different ages:

- Crew of elder whaling captain:
  - Striker: grandchild
  - Lookout: grandchild
  - Float man/Paddler: wife's cousin
  - Float man/Paddler: nephew from Gambell
  - Engineer: stepbrother
  - Assistant: stepbrother

- Crew of elder whaling captain:
  - Striker: brother
  - Engineer: cousin
  - Float man/Paddler: cousin
  - Float man/Paddler: nephew
  - Lookout: "relative" from Gambell

- Lund boat crew of young whaling captain:
  - Striker: son
  - Float man/Paddler: first cousin
  - Co-captain: brother

- Skin boat crew of middle-aged whaling captain:
  - Boyer: son
  - Striker: son
  - Float man/Paddler: nephew
  - Float man/Paddler: cousin
  - Engineer/Co-captain: brother

These examples are not necessarily representative of crews in Savoonga, but they suggest that generally close kinsmen (brothers, sons, cousins, nephews, etc.) are members of boat crews.

4.4.4.5 Beliefs and Values About Whaling

Jolles (2002) describes the spiritual orientation to whaling and subsistence hunting in contemporary St. Lawrence Island communities, and Lantis (1938) offers a historical perspective on the relationship between spirituality and whaling in Eskimo society. A belief expressed by some whaling captains also suggests a connection between spirituality and religious beliefs and whaling. In the words of one whaling captain interviewed for this project:

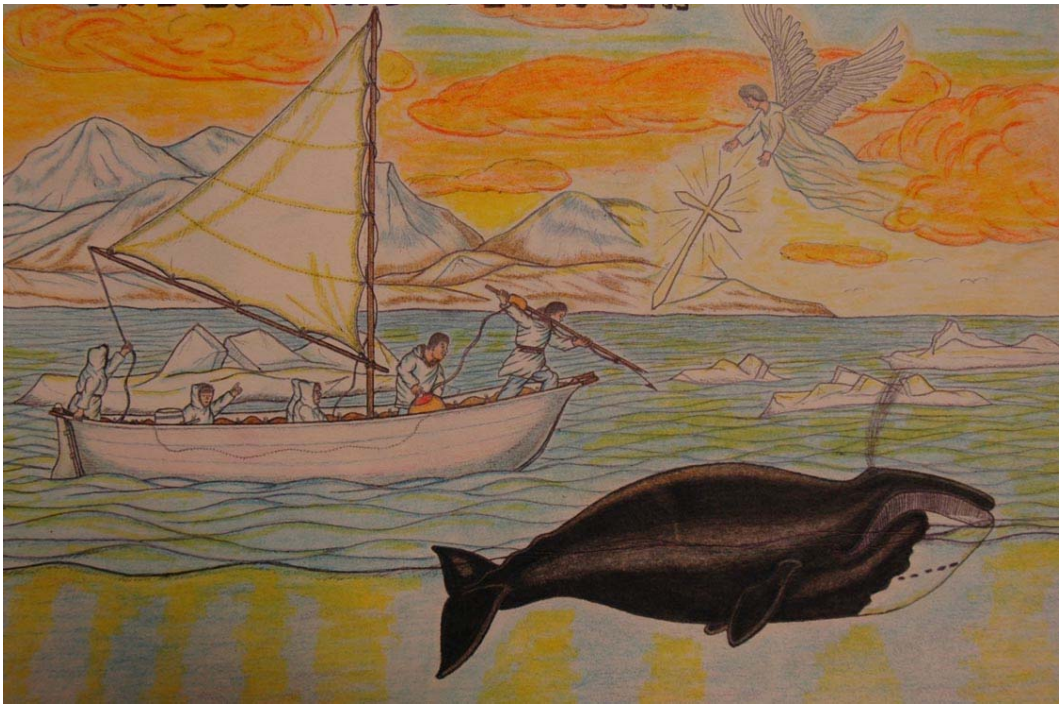
> *Generation through generation we have been taught that the purpose of our lives is to use these resources. That is our purpose; it is already planned for in our lives. Our Maker has given us this master plan. Our purpose is to partake of the*

ocean's resources. It is the focal point of our lives. In order to live a long life, you have to maintain the habitat, respect the animal, and see it as a gift. It is not just for the sake of killing it. Anyone can do that. Consider it a gift from our Maker. That is the Master Plan. You must also obey your parents and love the people around you. It is just a given that these are the things you must do.

Whaling captains made frequent references to the relationship between prayer, religious beliefs, and whaling. For example, one whaling captain shared a drawing made by one of his sons showing the taking of the son's first whale. In the drawing, reproduced below, the striker is guided by an angel in the upper right-hand portion of the drawing. This relationship between human actions, whaling, and spirituality is expressed in this drawing: the successful whaler receives spiritual guidance. These connections are also expressed in the accounts of whaling told by crew and captains. For example, one captain described prayer that occurs shortly after a whale is taken:

After we do [get] *a whale out there and get it all secure and ready, the elders want us to go all around that whale completely. We look up to the heavens and give thanks. All the boat captains gather around the whale and say a prayer. The elder of the crew leads the prayer.*

The spiritual connection of humans with whales is a topic developed in some detail by other authors (cf. Brower 2004). These connections suggest that when humans are in the proper spiritual and social relationship with the whale and with God, whaling can be successful. When these conditions are established, then the belief is that the whale "gives itself" to the hunters who have the "proper" relationship with the animal, with God, and their community.



Beliefs about successful hunting and whaling and proper behavior have cultural foundations in traditional beliefs (e.g., Lantis 1947; Søby 1969/70; Bogojavlensky and Fuller 1973; Fienup-Riordan 1994; Pelly 2001). Some whaling captains who participated in this study suggest that when they engage in proper behavior, then the opportunity for a successful hunt increases. Proper behavior entails maintaining social relationships and observing some of the norms associated with whaling. For example, a captain in response to a question about proper behavior listed the following as examples:

- Being careful while hunting.
- Togetherness and teamwork.
- Be responsible for your crew.
- Don't let the whale suffer.
- Share the whale.
- Give thanks to God.
- Be humble, don't brag, don't be proud.
- Don't drink or do drugs.

Proper behavior also expresses the social and spiritual relationships associated with whaling. Social relationships should be harmonious and respectful. And potentially socially disruptive behavior such as drinking or taking drugs is the antithesis of "proper behavior." Individuals should be humble and not set themselves apart from others with pride and hubris. In other words, proper behavior should be integrative and one should be thankful to God. Community integration and bonding, proper spiritual and social relationships, and success at whaling are connected. One result of these social, cultural, and spiritual connections is the experience of being a "whole person" in a "connected" community where "everybody is happy."

4.4.5 Nexus of Whaling and OCS

Savoonga residents who participated in this study were asked direct questions about the potential influences of OCS activity on their community. They responded with concerns about noise and the deflection of whale migration routes that might directly affect their access to whales. They also expressed substantial concern about the potential for an oil spill in an environment in which ice, currents, and weather are unpredictable. In addition, participants also noted the effects on whaling of changes in weather and ice conditions that they attributed to global warning and the unpredictability of external policies such as IWC strike limits and quotas. In this environment of cumulative effects, OCS activity is perceived to have the potential for a substantial effect even if this activity is distant. As one participant in this study noted:

> *Nothing is ever too far away when you are talking about subsistence resources. If they want oil development in Norton Sound, well, all of our food* [whales and walrus] *migrates through Norton Sound and* [our food] *could be exposed* [to oil contamination]*. You also have to remember that sound carries far in the water. If oil development starts in one place, then the government knows how far sound*

will travel in water. If they are going to do oil development, then they have to prove it will not divert my food. If an oil spill happens … well, the game will not come back in two or three years. People here think oil development will hurt the food they put on their table. I don't want oil development in my waters for those reasons.

Another participant expressed his concern in the context of the consequences of past famines and epidemics that resulted in the deaths of most residents in historical villages such as Kialegak (Southeast Cape):

In the past places like Kialegak were wiped out. The elders told us those stories. With oil development, the elders fear the same thing will happen to us. Even oil exploration can kill our traditional lifestyle, our language, and who knows what it can do to our health. We have diseases now that we don't know about.

CHAPTER 5
SURVEY AND COMPARATIVE ANALYSIS

5.1 INTRODUCTION

5.1.1 Overview

As described in Chapter 2, a total of three survey instruments were employed in 2004 in the four study villages, with the different survey instruments focused on different population subsets in each community. The three population subsets include general households, whaling captains, and the high school students of the community; elders were subsequently differentiated from other household respondents for additional analysis, but a separate survey instrument was not used for this subpopulation. Each of the three survey instruments contained both unique and overlapping questions aimed at obtaining data on the perceptions of the impacts of offshore oil-related activities on traditional Iñupiaq or Siberian Yup'ik culture and change to subsistence hunting, among other variables. The survey methodology is described in detail in Chapter 2, and full copies of the survey instruments are included in Appendix E.

This chapter presents key findings from analysis of two of the three survey instruments: the whaling captain and household surveys. As indicated in Chapter 2, an insufficient number of students were surveyed to draw meaningful conclusions from this population component.

5.1.2 Organization of Findings

The analysis of survey results is organized as follows:

- Section 5.2 describes people's general perceptions of changes in household economic circumstances and quality of life.
- Section 5.3 focuses on whaling captains' perceptions of changes in the migration patterns and abundance of bowhead whales.
- Section 5.4 discusses people's opinions of the impacts of oil and gas development and the influence (or lack of influence) community members have over this development.
- Section 5.5 examines people's perceptions regarding the changing role of and respect for elders and the sharing of subsistence food among households. In addition, people's descriptions of their degree of fluency in their traditional language and their level of participation in various subsistence activities are provided.

These topics are treated separately for the purposes of presenting survey findings; this does not imply that the topics are independent of each other. The persistence of Iñupiaq/Siberian Yup'ik values and culture is intertwined with the maintenance of subsistence whaling and the sharing of subsistence harvests among households and between communities. What is less clear, however, and thus the focus of this research, is whether there is a pervasive concern among North Slope

residents about changes in subsistence whaling and related cultural activities, and, if so, what is the perceived role of OCS development in those changes.

5.2 CHANGES IN QUALITY OF LIFE

This section describes people's general perceptions of changes in household economic circumstances and quality of life during the last 5 years.

5.2.1 Quality of Life

The household survey was administered at a time when declining production in the major onshore oil fields has led to declining revenue for the NSB during the last 5 years. Chapter 3 noted that this decline is reflected in decreased funding for social services and public infrastructure projects and decreased employment opportunities within the NSB government. One might expect that this recent economic downturn would influence people's attitudes toward the quality of village life. As discussed below, household survey respondents in the NSB communities are indeed troubled by the declining revenues and job availability. However, Figure 5-1 shows that over 80% of the non-elders surveyed feel that the overall quality of life for their household has either stayed the same or improved; especially optimistic are non-elders residing in the smaller NSB communities of Kaktovik and Nuiqsut.

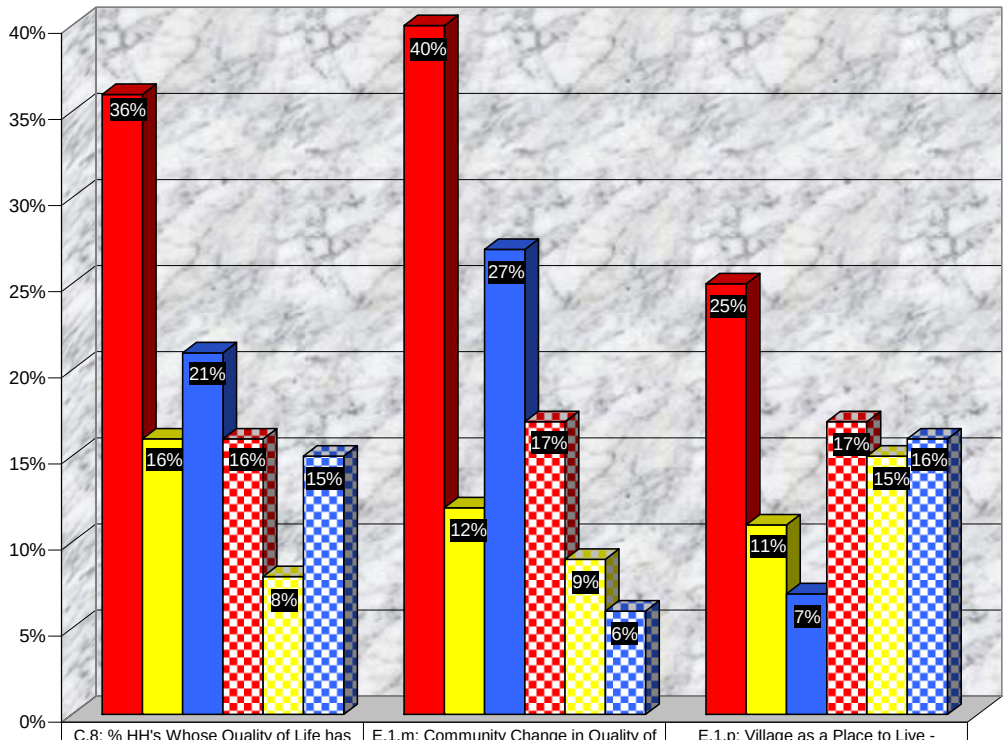
On the other hand, more than 35% of the elders in Barrow are concerned about decreases in their household's quality of life. A large percentage of Barrow elders express this same pessimism with respect to the quality of life in their community as a whole. Factors discussed below, including a perceived lack of jobs, increase in substance abuse and crime, and erosion of traditional values, are likely the basis for this discontent. On the other hand, a comparatively small percentage (25%) of Barrow elders believe that their community has become worse as a place to live. Many Savoonga elders also express a concern about a negative shift in the quality of life in their community, but they also generally maintain that Savoonga, while changing, is still a good place to live.

5.2.2 Aspects of Community Life

While most household survey respondents, regardless of age or community, are satisfied with the stability they see in the overall quality of life for their family and community over the last 5 years, there are clearly aspects of village life that are of significant concern. As shown in Figure 5-2, more than 70% of Barrow residents believe good jobs are becoming increasingly hard to find. In Kaktovik and Nuiqsut there is a similar widespread concern about job availability, especially among elders. For some people the reduced availability of good jobs has resulted in lower personal incomes; in the NSB communities about one-third of the respondents reported a worsening of their household's financial situation. The comparatively low percentage of respondents in Savoonga who believe the opportunities for good jobs has not decreased does not necessarily reflect optimism about employment prospects; rather, it more likely reflects an assessment that the job situation in one of the most economically depressed communities in Alaska is neither better nor worse than it was 5 years ago.

Figure 5-1. Household Survey – Questions C.8, C.8.1, E.1.m, E.1.p
Changes in Quality of Life – All Communities

C.8. Compared to the past few years, is your family's quality of life (defined as money available, time and ability to subsistence hunt and fish, educational opportunities, job opportunities in the community, relations with others in the community, and so on): Better, About the same, Worse, or Don't know?
C.8.1. Can you explain why?
E.1.m. Has the quality of life in this community: Increased, Stayed the same, or Decreased?
E.1.p. Has this village as a place to live: Improved, Stayed the same, or Become worse?

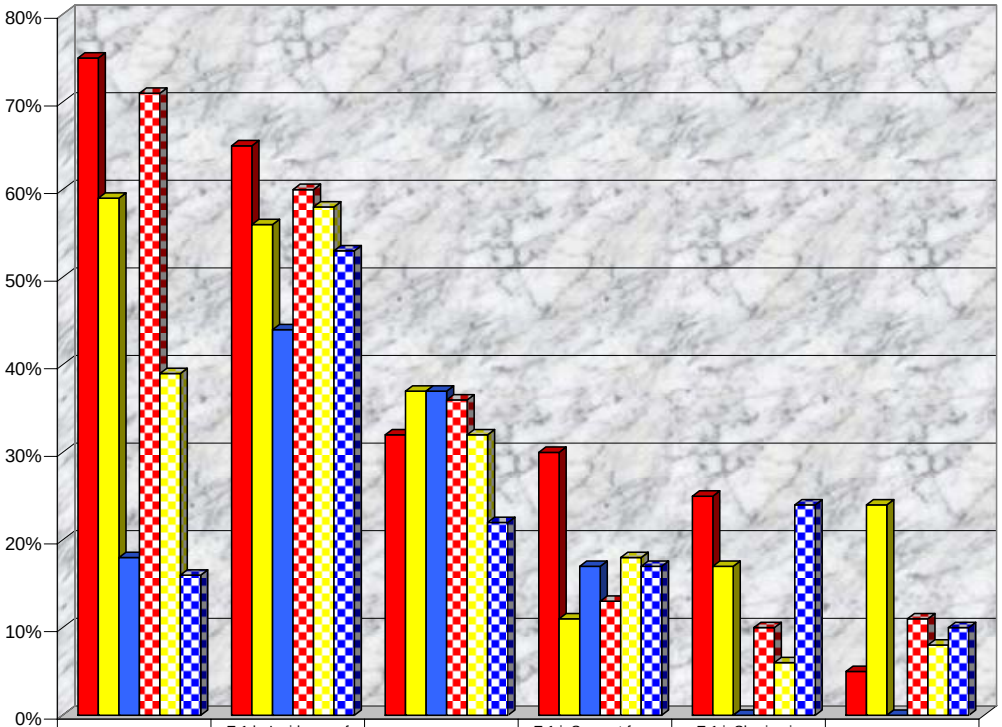


	C.8: % HH's Whose Quality of Life has Gotten Worse	E.1.m: Community Change in Quality of Life - Decreased	E.1.p: Village as a Place to Live - Worsened
Barrow Elders	36%	40%	25%
Kak./Nuiq. Elders	16%	12%	11%
Savoonga Elders	21%	27%	7%
Barrow Non-Elders	16%	17%	17%
Kak./Nuiq. Non-Elders	8%	9%	15%
Savoonga Non-Elders	15%	6%	16%

Notes:
1. Due to the low sample sizes for elders in Kaktovik and Nuiqsut, the responses from these communities were combined.
2. HH = household

Figure 5-2. Household Survey – Questions E.1.c, E.1.h, C.7, E.1.i, E.1.j, E.1.n Changes in Aspects of Community Life Over the Last 5 Years – All Communities

E.1.c. Have the opportunities for good jobs: Increased, Stayed the same, or Decreased?
E.1.h. Have incidences of drinking, taking drugs, fighting, or stealing: Increased, Stayed the same, or Decreased?
C.7. During the past 5 years, has your household's financial situation been: Getting better, Getting worse, Stayed the same, or Don't know?
E.1.i. Has the number of people who support each other in times of need in the village: Increased, Stayed the same, or Decreased?
E.1.j. Has the number of people sharing with others in the community: Increased, Stayed the same, or Decreased?
E.1.n. Has the opportunity to participate in whaling: Increased, Stayed the same, or Decreased?



	E.1.c: % of Good Jobs - Worse	E.1.h: Incidence of Drinking/Drugs/Violence - Increased	C.7: % HH Income has Gotten Worse	E.1.i: Support from Community - Decreased	E.1.j: Sharing in Community - Decreased	E.1.n: Opportunity for Whaling - Decreased
Barrow Elders	75%	65%	32%	30%	25%	5%
Kak./Nuiq. Elders	59%	56%	37%	11%	17%	24%
Savoonga Elders	18%	44%	37%	17%	0%	0%
Barrow Non-Elders	71%	60%	36%	13%	10%	11%
Kak./Nuiq. Non-Elders	39%	58%	32%	18%	6%	8%
Savoonga Non-Elders	16%	53%	22%	17%	24%	10%

Notes:
1. Due to the low sample sizes for elders in Kaktovik and Nuiqsut, the responses from these communities were combined.
2. HH = household

There is also a widespread perception that levels of alcoholism, drug use, and violence within the project communities have increased. Nevertheless, a majority of respondents perceive a continuity in the integral traditional values of community support and sharing. Moreover, only a relatively small percentage of respondents believe that the opportunity for whaling has decreased. This is not to say that the continuity of whaling is not a concern among survey participants. At the time of the survey, the perpetuation of whaling was clearly a major issue in all the project communities; however, it would appear that most residents feel they have some control over this issue, barring a major outside action, and are confident that the younger generation considers the maintenance of subsistence whaling a priority. Concerns over increasing substance abuse and violence may be greater due to the perception among residents that they have little direct control over these issues.

5.3 CHANGES IN SPRING/FALL MIGRATION PATTERNS AND ABUNDANCE OF BOWHEAD WHALES

This section focuses on whaling captains' perceptions of changes in the migration patterns and abundance of bowhead whales.

5.3.1 Migration Patterns of Bowhead Whales

As described in Chapter 4, Nuiqsut and Kaktovik whale exclusively in the fall, while Savoonga and Barrow whale in both the spring and fall. Whaling captains from the spring whaling communities were asked if they had noted any significant change in the migration patterns of bowhead whales during the past 5 years; Table 5-1 summarizes their responses. A majority (54%) of Barrow whaling captains noted a difference, whereas only about one-quarter (27%) of the whaling captains from Savoonga responded with a similar perception. The reasons given by those who have noticed a significant change in spring migration patterns are summarized in Tables 5-2 and 5-3. Table 5-2 groups comments by common themes; Table 5-3 shows the actual comments from respondents in Barrow and Savoonga.

Table 5-1. Whaling Captain Survey – Question C.6.a
Changes in Spring Bowhead Migration – Barrow and Savoonga

C.6.a. How has the spring migration paths of bowhead whales changed over the past 5 years? Have they changed significantly or have they remained the same as they have been for years?

Response	Barrow		Savoonga	
	Number	Percent	Number	Percent
Changed significantly	20	54%	6	27%
Remained the same	17	46%	16	73%
Total	37	100%	22	100%

Table 5-2. Whaling Captain Survey – Question C.6.b
Aggregated Causes of Changes in Spring Bowhead Migration – Barrow and Savoonga

(responses in Table 5-2 only include those responding "Changed Significantly" to C.6.a)

C.6.b. Can you tell me all the reasons for changes in their (Spring) migration paths?

Aggregated Response	Barrow		Savoonga	
	Number	Percent	Number	Percent
Oil and gas development	2	10%	0	0
Climate, including changing ice conditions	15	75%	4	67%
Other/No Reason	3	15%	2	33%
Total	20	100%	6	100%

Table 5-3. Whaling Captain Survey – Question C.6.b
Causes of Changes in Spring Bowhead Migration – Barrow and Savoonga

(responses in Table 5-3 only include those responding "Changed Significantly" to C.6.a)

C.6.b. Can you tell me all the reasons for changes in their (spring) migration paths?

Barrow
Wainright whalers are using outboard motors and are scaring whales farther out with their noise.
Pack ice is going too far north.
The whales arrive one week earlier than the normal due date; the width of the route is changing; normally there is an opening. From Barrow there is a big bubble so the whales have a big open lead where they can go; the whales are more spread out.
The whales come earlier every year.
They come to Barrow earlier; missed the first group we like to catch; migration path is the same, but timing is earlier than before.
The whales come earlier.
Due to ice conditions; they follow the lead where there is open water.
Whales are farther out due to disturbance by research boats.
Research ships and ice breakers have changed the paths.
The ice has changed; the old anchored ice is missing; the early warm up leads to ice break-up; the whales are coming earlier (mid-April); both human activity and natural causes (global warming) are responsible.
Global warming has led to warmer temperatures and changing ice conditions; ocean currents are faster.
As a result of climate change, migration has started earlier.
Whales go out more; do not come close to shore.
The whales have been farther away from the shore ice; whalers in Wainwright started using outboard motors during the spring hunt.
Ice is not as thick; more open leads; whales are farther out and are coming earlier (March).
Outboard motor use has increased in the past 6-7 years. Also, the whaling captains voted for an early whale hunt start date.
Whales are migrating earlier; the young ones went by earlier.
The whales are farther offshore more often; the main migration passes by in May, outside the reach of crews. As a result, crews spend more idle days.
Global warming causes ice to go out earlier. As a result, whales pass by before crews go out on the ice.
Depends on the main shore ice; if the lead is farther out or in, but no significant changes.
Savoonga
They move up north too soon.
Seems like more are passing on the east; didn't see much this year, but have seen a lot on the East side. Camp is on the south. Migration used to go to the south and west but this is changing.
Ice goes out more quickly now; less whales in the spring.
More sightings; there are now three pulses of whales; the small come first, then the second, which are larger, then females and calves. Beluga always come first.
They are gradually changing; the sun would rise and melt all the snow; can't get back to the snow machines.
They are coming earlier than usual; mostly coming in March.

Some whaling captains responded to questions C.6.a and C.6.b with comments about change in whaling *generally* or pointed out that longer-term (greater than 5 years) change in the migration path has occurred (see Endnote 2, LGL Marine Mammal Acoustic Monitoring Seismic Study). For example, one whaling captain in Barrow noted:

> *The question* [C.6.a] *assumes change over 5 years. Five years does not tell the whole story, if you restrict it to that. For example, it was 7 or 8 years ago that a rig was put up, there were big changes from 10 years ago, but not necessarily within the last 5 years. The survey question does not capture that. It could lead to inaccurate answers, if you just look at the question in terms of the last 5 years; you need to look over the course of time, since OCS activity began.*

Nevertheless, the survey responses indicate that climate change plays a major part in the explanation for changes in spring bowhead migration patterns, either in the timing of the migration or the migration path. Typically, respondents indicate that bowhead whales are arriving earlier and/or passing farther offshore. Of those respondents who provided a rationale for why there was a change in migration behavior, 75% stated changes in weather and ice conditions, sometimes specifically using the term "climate change." Only two respondents mentioned the effects of activities related to oil and gas development; specifically, they thought that the activities of research ships involved in oil and gas development have caused changes in the spring whale migration patterns.

Two similar questions dealing with fall migration were also asked. Table 5-4 summarizes whaling captains' perception of changes in bowhead migration during fall whaling. A similar proportion of Barrow whaling captains noted a significant change in migration behavior, and about 40% of the whaling captains from the other communities noted such a change.

Table 5-4. Whaling Captain Survey – Question C.5.a
Changes in Fall Bowhead Migration – All Communities

C.5.a. How have the fall migration paths of bowhead whales changed over the past 5 years? Have they changed significantly or have they remained the same as they have been for years?

Response	Barrow		Kaktovik/Nuiqsut		Savoonga	
	Number	Percent	Number	Percent	Number	Percent
Changed significantly	19	53%	5	38%	8	40%
Remained the same	17	47%	8	62%	12	60%
Total	36	100%	13	100%	20	100%

Reasons given for the change in fall migration patterns are summarized in Tables 5-5, 5-6, and 5-7. Some respondents described changes in whale behavior or the number of whales sighted even though they believe that the fall migration paths of the whales have not changed significantly or are unsure if significant changes have occurred. Table 5-5 groups comments by common themes; Table 5-6 shows the actual comments from respondents in Savoonga, while

Table 5-7 shows the actual comments from respondents in Barrow, Nuiqsut, and Kaktovik. As can be seen in these tables, however, many respondents who selected "Remained the same" still shared perceived changes in fall migration patterns, suggesting that changes are more common than is evidenced by the responses presented in Table 5-4.

Table 5-5. Whaling Captain Survey – Question C.5.b
Aggregated Causes of Changes in Fall Bowhead Migration – All Communities

C.5.b. Can you tell me all the reasons for changes in their (fall) migration paths?

Aggregated Response	Barrow		Kaktovik/Nuiqsut		Savoonga	
	Number	Percent	Number	Percent	Number	Percent
Oil and gas development	14	64%	8	80%	0	0
Climate, including changing ice conditions	6	27%	0	0%	2	11%
Other/No Reason	2	9%	2	20%	15	89%
Total	22	100%	10	100%	17	100%

Table 5-6. Whaling Captain Survey – Question C.5.b
Causes of Changes in Fall Bowhead Migration – Savoonga

C.5.a. How have the fall migration paths of bowhead whales changed over the past 5 years? Have they changed significantly or have they remained the same as they have been for years?
C.5.b. Can you tell me all the reasons for changes in their (fall) migration paths?

Response	Causes of Changes
Remained the same	They are increasing in the fall; more than they used to see.
Remained the same	Population is growing; we see more whales.
Remained the same	The ice is very late in the fall.
Remained the same	Depends on the whales; it's different every year
Changed significantly	Five years ago they started coming to the northern side of the island.
Changed significantly	More whales in the fall time; more abundance of food in the fall; climate change.
Changed significantly	Increase in the number of whales; more new whales; more and more yearlings.
Remained the same	Getting more whales in the fall time because they come in closer to the shore.
Remained the same	Coming in closer.
Remained the same	Whales come later now.
Don't know	Never used to see whales in the fall; it started 10 years ago for the first time.
Changed significantly	Starting to see whales here now; never used to see the whales off Savoonga.
Changed significantly	When I first started, there were hardly any whales; now there are a lot.
Changed significantly	Seeing a lot more whales in the fall
Changed significantly	Increasing in number.

Table 5-7. Whaling Captain Survey – Questions C.5.a, C.5.b
Causes of Changes in Fall Bowhead Migration – NSB Communities

C.5.a. How have the fall migration paths of bowhead whales changed over the past 5 years? Have they changed significantly or have they remained the same as they have been for years?
C.5.b. Can you tell me all the reasons for changes in their (fall) migration paths?

Response	Causes of Changes
Barrow	
Changed significantly	A lot of whales are traveling farther out than before. Five years ago they would go right off the point; now it is 20-30 miles. Too noisy, there has been a big change since seismic activity.
Changed significantly	More activities within Barrow; Coast Guard, commercial tug boats, and offshore drilling [outside the vicinity of Barrow].
Changed significantly	Seismic activity; since they started oil drilling in Prudhoe bay, this pushed whales farther out.
Changed significantly	Currents change; polar studies show whales follow the currents; migration is later in the fall than normal in the last 5-10 years; the ice is thawing early and freezing late.
Changed significantly	The ocean has considerably warmed up and the whales came earlier last year.
Changed significantly	Whale migration has changed depending on offshore human activity.
Changed significantly	Ice conditions to the west.
Changed significantly	Each year is different depending on offshore activity such as seismic, oil rig and barge activity.
Changed significantly	Noise disturbance from offshore drilling and construction of islands has caused whales to go farther out. They can be pursued with outboard motor boats but only on calm days. These motorboats can also contribute to the noise disturbance.
Changed significantly	The whales are going farther offshore, 15-20 miles. As a result, crews are no longer hunting in their usual areas, which were a maximum of five miles from shore. The whales have been disturbed by offshore industrial activity and vessel traffic which create noise disturbance.
Changed significantly	Weather, offshore seismic activities and other oil-related activities, ice breakers and general noise from ships, airplanes, and helicopters.
Changed significantly	Used to be colder. The migration is starting early because water is warmer due to climate change.
Changed significantly	When there is seismic activity the whales go farther out. When it stops they come in close as usual.
Changed significantly	In the east whales have been close to shore because offshore oil activity has stopped.
Changed significantly	Whales are farther out. Wainwright crews started using outboards a few years ago and since then the whales have been spooked. Also, maybe the environment is changing.
Changed significantly	Noise pollution from seismic activity, ship traffic, etc.
Changed significantly	Offshore oil development activities have disrupted route.
Changed significantly	Ice conditions have changed; as a result, crews have to go out farther.
Don't know	In the last 30 years there are now planes, boats, etc. In the past, people went to the Point and waited for the whales. They didn't have to go 15-20 miles offshore; at that time, whales traveled right to the Point.
Remained the same	Remained the same unless there is OCS activity or a drilling platform.
Remained the same	Remained the same, but last fall was different. Migration was farther to the north than usual. It was 25 miles farther than normal.
Remained the same	Traveled a little farther out than in past years.
Remained the same	Remained the same, but more whales during the fall.

Response	Causes of Changes
Remained the same	Remained the same, but longer delay in opening of the season. When hunt begins, water is rougher than in summer months.
Remained the same	Remained the same, but barges going to Prudhoe may change the path
Remained the same	When seismic activity is conducted they go out farther. When this activity stops they come closer.
Nuiqsut	
Don't know	Not sure what is meant by "change" in the question; however, when Endicott causeway and development went in, the whales went farther out. When the oil companies do seismic in the area the migration changes rapidly and the whales went way out from Cross Island. When there is no seismic activity in the area, whales come very close to Cross Island during their migration.
Changed significantly	Whales are now closer to Cross Island than they have been in the recent past. This is a resumption of the normal or expected pattern. Industrial activities such as seismic exploration had pushed the migration farther out than the normal pattern, but now that such activity has been ended for several years the whales have resumed there normal migration route.
Changed significantly	When there was seismic or drilling activity to the east of Cross Island, the whales were diverted farther away from Cross Island. As soon as this activity stopped (or rather, the year after it stopped) whales once again came close to Cross Island; some within a mile. This is the normal pattern; that pattern which was observed by whalers since at least the 1920s and before.
Changed significantly	Activities such as offshore oil and gas have changed the whales' migration pattern and the whales' behavior. More industry activity means more and greater whale diversion. Examples of activity are seismic exploration and open water drilling at Hammerhead and Kuvlum. The year when actual drilling occurred, Nuiqsut whalers had to go far to the north to scout and find whales. As recently as 2000-2001, the oil companies did some open water seismic work.
Remained the same	Migration route changes when there are activities east of Cross Island. One season we had to look for whales 35 miles northwest of Cross Island before we could find any due to oil and gas activities. Since such activities east of Cross Island have been curtailed, the migration has been pretty much the same and as expected.
Remained the same	The only difference is that the migration is a little farther offshore than in the past; this is due to too much activity going on in the ocean.
Remained the same	Don't want to choose "change" or "no change." The migration is essentially the same from year-to-year, but it can be diverted by natural and artificial factors. Some years we need to go out farther to find whales, but in the same general direction. If there are activities such as barges hauling fuel to Kaktovik, oil and gas seismic, the whale migration will be deflected.
Remained the same	The migration did change when there were seismic crews out in the area, but for the last five years it has been okay. Ice conditions have been good; not too much ice. The only problem has been weather; stormy and fog. If there is no industry activity, there is no real problem with finding whales near Kaktovik. The whales are not far out in a normal year and are found in the same places every year unless disturbed by industry activities.
Kaktovik	
Remained the same	The migration is pretty much the same when things are normal. When there are industry activities the whales change their migration route; they get spooky and swim farther out from shore. They are harder to approach and rush to dive.
Remained the same	Essentially the same, but the migration can be affected by industry activities.

Response	Causes of Changes
Remained the same	The migration path has been the same ever since the drilling rig to the east stopped drilling. When this rig was active the whales went 15 miles out. Normally whales can be as close as one mile offshore.
Remained the same	The last time the migration was significantly different was in 1995 or 1996, when the whales went significantly farther offshore than normal. Otherwise, the whales have always been 3 to 15 miles offshore or so.
Changed significantly	Seismic activity changes the path that the whales take; it makes them go out much farther. After the Kaktovik whalers get a whale and during the period when they are onshore for a few days butchering and dividing it, the oil companies can work for a few days; when the whalers are ready to go out again the oil companies hold up their work until another whale is taken. This works for both the whalers and the oil companies. Since Kaktovik people have started to whale again the oil companies have started to listen to them. They usually just wait until the whalers fill the quota. This agreement between the whalers and the oil companies is negotiated through the AEWC. The whalers still need to obtain observers on all industry boats and rigs during industry activities.
Changed significantly	Each year it seems like the whales go a little farther offshore; some of them, anyway. Some are still close to shore, where they have always been. There has hardly been any ice the last few years, and the lack of ice may be why some whales are going farther offshore; there has been no ice nearby.

The primary change noted by Savoonga whaling captains is an increase in the sightings of whales during the fall. As with the spring migration, some Savoonga respondents attribute changes in the fall whale migration patterns to climate change, but most did not offer a reason for the changes noted.

In contrast, almost 60% of the 26 Barrow whaling captains who described some change in the fall whale migration pattern attribute the change to oil and gas development. Respondents in Kaktovik and Nuiqsut, the closest NSB communities to oil and gas development, believe nearly all the changes in migration patterns are due to this development. The main change reported by whaling captains in the NSB communities is deflection of the whales farther offshore by noise and other disturbances. Some of the noted difficulties this deflection can cause whalers include spoiled meat due to longer towing distances, higher boat fuel coats, and increased risk of accidents, as sea conditions farther offshore are rougher. While climate change will likely affect the migratory path of whales, some NSB community whaling captains report that whales return to normal migration routes after the noise generated by offshore oil and gas development activities stops.

5.3.2 Abundance of Bowhead Whales

When asked to assess changes in the abundance of whales, only 10% of the 67 whaling captains who responded said they saw fewer whales than they expected, and 49% saw more whales than expected (Table 5-8). There is no consensus as to why more whales are being seen, although some captains are of the opinion that the bowhead whale population is growing.

Table 5-8. Whaling Captain Survey – Question C.8
Amount of Whales Seen Compared to Expectations – All Communities

C.8. Over the last 5 years, have whaling crews seen more, the same number, or fewer whales than they had expected?

Response	Total	Barrow		Kaktovik/Nuiqsut		Savoonga	
	Number	Number	Percent	Number	Percent	Number	Percent
More	33	19	56%	3	23%	11	55%
Same	27	10	29%	10	77%	6	35%
Fewer	7	5	15%	0	0%	2	10%
Total	67	34	100%	13	100%	20	100%

5.4 COMMUNITY IMPACTS OF OIL AND GAS DEVELOPMENT

This section discusses people's opinions of the impacts of oil and gas development and the influence (or lack of influence) community members have over this development.

5.4.1 Impacts of Oil and Gas Development on Communities

Table 5-9 summarizes the perceptions of whaling captains of the impacts (positive, negative, neutral) of oil and gas development on aspects of community life over the past 5 years. The high percentage of surveyed whaling captains who responded that oil and gas development had a neutral effect or responded that they "don't know" or declined to offer an opinion suggests that many whaling captains have mixed feelings about the effects of this development. Open-ended responses give some credence to this interpretation. On the positive side, respondents commented on the increased availability of good jobs, higher household incomes, and tax revenues for NSB social services and capital infrastructure projects. Comments on the negative

Table 5-9. Whaling Captain Survey – Question E.1.d
Impact of Oil and Gas Development – All Communities

E.1.d. In the last 5 years, has the impact of oil and gas development on aspects of the community such as Iñupiaq language, traditional activities, and subsistence been: Positive, Neutral, or Negative?

Response	Number	Percent
Positive	12	18%
Neutral	29	44%
Negative	15	23%
Don't know	10	15%
Subtotal	66	100%
Missing or no answer	7	
Total	73	

aspects of oil and gas development included increased difficulties in engaging in subsistence activities due to environmental disturbances and high levels of alcoholism and drug abuse.[8]

As shown in Table 5-10, there is a marked shift in response when whaling captains are asked their opinion of offshore oil and gas development generally. While a fairly high percentage of respondents have a mixed opinion about this development (as was the case when asked about impacts to the community over the past 5 years), the majority expressed a negative view of oil and gas development in general, and few think that it is good. A cross-tabulation analysis suggests that this negative judgment is due to the perceived impacts of OCS development on marine mammal subsistence pursuits. About 60% of the NSB community whaling captains who believe OCS development is bad believe that the fall migration patterns of bowhead whales have changed significantly over the last 5 years.

Table 5-10. Whaling Captain Survey – Question E.1.i
Impact of OCS Development – All Communities

E.1.i. Do you think offshore oil and gas development in the Beaufort Sea (NSB communities) or Bering Straits (Savoonga) is: Good, Equally good and bad, or Bad?

Response	Number	Percent
Good	3	4%
Equally good and bad	24	36%
Bad	40	60%
Total	67	100%

Further, over two-thirds (69%) of the surveyed whaling captains in the NSB communities believe that it is not possible to have oil drilling in offshore coastal areas and at the same time provide adequate safeguards to protect the environment and important cultural activities. (Table 5-11). On the other hand, whaling captains in Savoonga are less pessimistic, with only 28% of them indicating that OCS development is incompatible with environmental protection and cultural activities.

[8] Comments related to the impacts of oil and gas development on communities, both positive and negative, may be considered somewhat narrow by detached observers. For example, other positive impacts may include oil-industry funding for open-water season communications systems that allow for real-time reporting and coordination of whale migration information, added search and rescue capabilities, cache supplies on Cross Island, and/or other logistical support. Other negative impacts may include increased risk of an oil spill or other adverse environmental event, aesthetic concerns, and/or sociocultural impacts including language loss.

Table 5-11. Whaling Captain Survey – Question E.1.l
Compatibility of OCS Development with Protection of Environment – NSB Communities

E.1.l. Please tell me if you agree with this statement: "It is possible to have oil drilling in offshore coastal areas and at the same time provide adequate safeguards to protect the environment and important cultural activities." Agree, No opinion, or Disagree?

Response	Number	Percent
Agree	11	23%
No opinion	4	8%
Disagree	33	69%
Total	48	100%

5.4.2 Community Influence Over Oil and Gas Development

As shown in Table 5-12, more than half of surveyed whaling captains are optimistic about their community's capability to influence onshore oil and gas development.

Table 5-12. Whaling Captain Survey – Question E.1.j
Capability to Influence Onshore Oil and Gas Development – All Communities

E.1.j. Do you think people in (village) have the capability to influence onshore oil and gas development?

Response	Number	Percent
Yes	39	57%
No	10	15%
No opinion	19	28%
Total	68	100.0

A similarly high percentage of whaling captains are confident about their community's capability to influence offshore oil and gas development (Table 5-13).

Table 5-13. Whaling Captain Survey – Question E.1.k
Capability to Influence Offshore Oil and Gas Development – All Communities

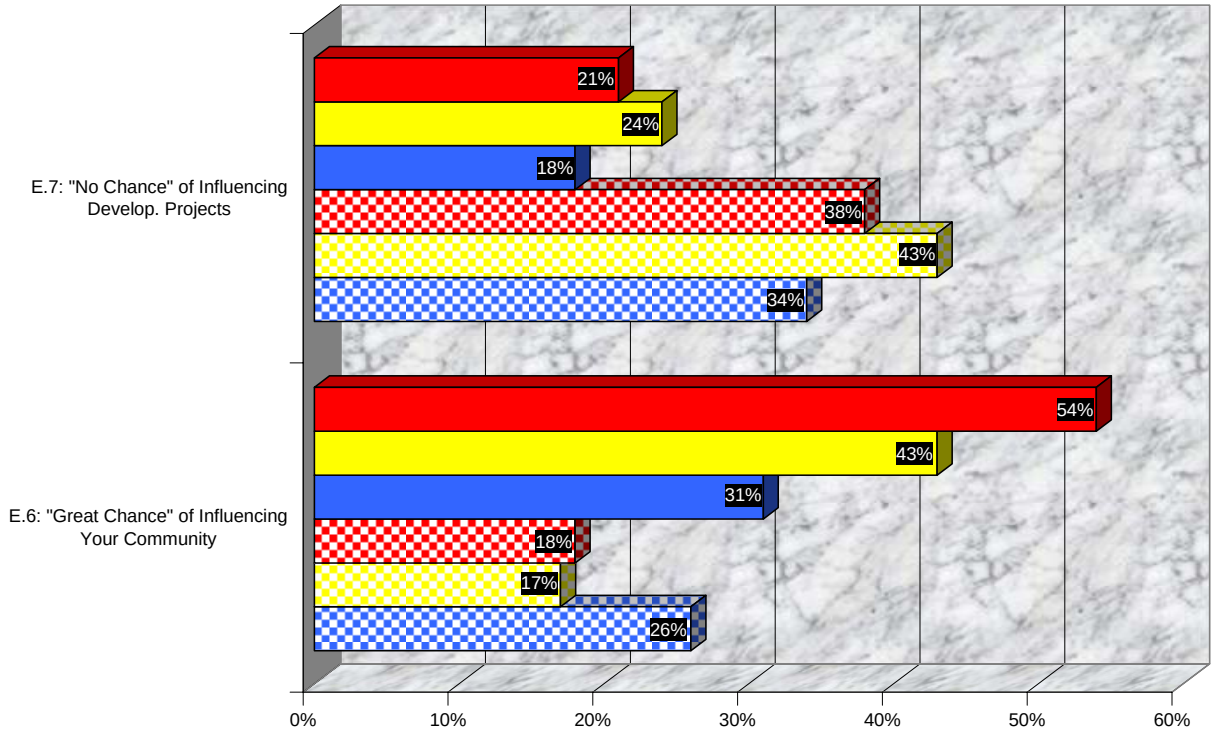
E.1.k. Do you think people in (village) have the capability to influence offshore oil and gas development?

Response	Number	Percent
Yes	34	53%
No	18	28%
No opinion	12	19%
Total	64	100%

A question concerning the extent of community influence was also asked in the household survey. Figure 5-3 compares elders and non-elders across project communities with respect to their confidence in influencing events that affect their lives such as development projects. More than 40% of the surveyed elders in the NSB communities think they have a "great chance" to influence events. A lower percentage of the elders in Savoonga feel the same way. Only about 17% of the non-elders in the NSB communities feel they have a "great chance" to influence community outcomes, with about one-quarter of Savoonga's non-elders having the same reaction. Given their traditional stature within the community, the optimism of many elders, at

Figure 5-3. Household Survey – Questions E.6 and E.7
Capability to Influence What Happens in Community – All Communities

E.6. Do you have a Great chance, Some chance, or No chance at all of influencing how things are done in your community?
E.7. Do you have a Great chance, Some chance, or No chance at all of influencing development projects that potentially affect your community?



	E.6: "Great Chance" of Influencing Your Community	E.7: "No Chance" of Influencing Develop. Projects
Barrow Elders	54%	21%
Kak./Nuiq. Elders	43%	24%
Savoonga Elders	31%	18%
Barrow Non-Elders	18%	38%
Kak./Nuiq. Non-Elders	17%	43%
Savoonga Non-Elders	26%	34%

Notes:
1. Due to the low sample sizes for elders in Kaktovik and Nuiqsut, the responses from these communities were combined.

least among those in the NSB communities, is not unexpected. Perhaps the overall pessimism among Savoonga respondents about their influence reflects the continuing dire economic situation of the community. Perceptions of changes in the influence of elders are examined further in Section 5.6.

5.5 TRADITIONAL VALUES AND SUBSISTENCE ACTIVITIES

This section examines people's perceptions regarding the changing role of and respect for elders and the sharing of subsistence food among households. In addition, people's descriptions of their degree of fluency in their traditional language and their level of participation in various subsistence activities are provided.

5.5.1 Knowledge of Traditional Language

The household survey questioned participants about the use of Iñupiaq (NSB communities) or Siberian Yup'ik (Savoonga) in their households and the fluency of household members in their traditional language. The number of responses in the household survey are presented in Tables 5-14 and 5-15, while Table 5-16 presents these results using percentages and more consolidated age groupings to facilitate comparison. There are clear differences in the level of fluency across age groupings, especially in the NSB communities. Based on the survey findings, about 7% of the members of NSB community households under the age of 35 speak their Native language fluently. In contrast, 70% of the members of Savoonga households under the age of 35 speak their Native language fluently.

Table 5-14. Household Survey – Question B.20
Fluency of Individuals in Iñupiaq – NSB Communities

B.20. What languages are spoken fluently in your household? How many individuals are fluent in each language that has been identified? What are their ages?

Responses		Age					Total
		0-2	3-15	16-35	36-60	61+	
Fluency in Iñupiaq	Fluent	2	13	24	218	92	349
	Less fluent	8	174	178	58	0	418
	Don't speak	20	72	46	10	0	148
Total		30	259	248	286	92	915

Table 5-15. Household Survey
Fluency of Individuals in Siberian Yup'ik – Savoonga

Responses		Age					Total
		0-2	3-15	16-35	36-60	61+	
Fluency in Siberian Yup'ik	Fluent	8	64	79	70	37	258
	Less fluent	3	41	15	0	0	59
	Don't speak	1	6	0	0	0	7
Total		12	111	94	70	37	324

Table 5-16. Household Survey – Question B.20
Fluency of Individuals in Iñupiaq/Siberian Yup'ik – All Communities

B.20. What languages are spoken fluently in your household? How many individuals are fluent in each language that has been identified? What are their ages?

Responses		Age			
		0-15	16-35	36-60	61+
Fluent	Iñupiaq	5%	10%	76%	100%
	Siberian Yup'ik	59%	84%	100%	100%
Less fluent	Iñupiaq	63%	72%	20%	0%
	Siberian Yup'ik	35%	16%	0%	0%
Don't speak	Iñupiaq	32%	18%	4%	0%
	Siberian Yup'ik	5%	0%	0%	0%

5.5.2 Role of Elders

Figure 5-4 provides responses to three questions in the household survey regarding the influence, respect, and amount of sharing that elders experience. Many Savoonga non-elders are concerned about changes in the role of elders, with 68% stating the influence of elders has decreased and 55% stating that respect for elders has declined. Fewer non-elders in the NSB communities expressed these concerns. Only a small percentage of the non-elders in the project communities indicated that sharing with elders, a traditional sign of respect, has declined. With regard to the perceptions of elders themselves, 46% of Savoonga elders and 33% of NSB community elders feel that their influence has diminished. A relatively high percentage (29%) of Barrow elders reported a decline in sharing.

Additional analysis grouped the age of the "non-elder" sample into four age intervals (16-35 years, 35-46 years, 47-59 years, and 60+ years) of similar size but found no significant relationship between age and the survey response to question B.16 regarding a decrease in influence (Chi-Square=.5), question B.17 regarding a decrease in respect (Chi-Square=.08), or question B.18 regarding a decrease in sharing (Chi-Square=.35).

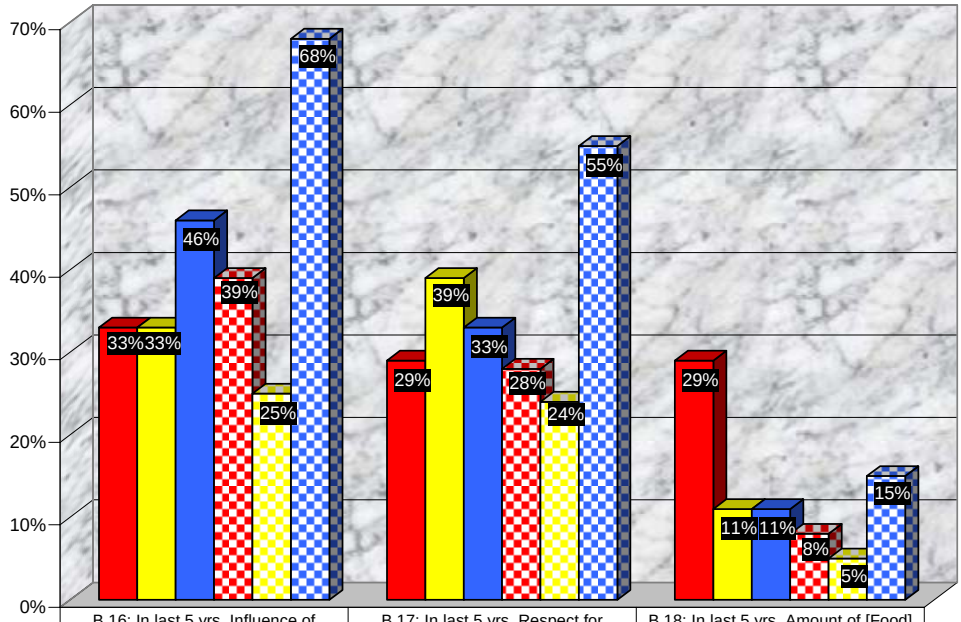
5.5.3 Subsistence Activities

Figure 5-5 compares subsistence resource use between elder and non-elder households across the NSB communities. The first questions (Questions B.7 and B.8.b) provide information on the level of importance of subsistence and store-bought foods in the diets of survey participants. Nearly half of both elder and non-elder households in Kaktovik and Nuiqsut obtain a relatively low amount ("none" or "about a quarter") of subsistence foods in their diet from hunting, fishing, or gathering by household members. Further, more than half of both elder and non-elder households in all the NSB communities stated they purchase foods because store-bought foods are a regular part of their diet.

In contrast, Figure 5-6 indicates that 81% of Savoonga elders and 82% of non-elders depend on subsistence resources for a substantial part of their diet. Twenty-five percent of non-elder households and only 16% of elder households in Savoonga indicated that store-bought foods are a regular part of their diet.

Figure 5-4. Household Survey – Questions B.16, B.17, B.18
Changes in Role of Elders – All Communities

B.16. Over the last 5 years, has the influence of elders in this community: Increased, Remained the same, or Decreased?
B.17. Over the last 5 years, has respect for elders in this community: Increased, Remained the same, or Decreased?
B.18. Over the last 5 years, has [food] sharing with elders: Increased, Remained the same, or Decreased?

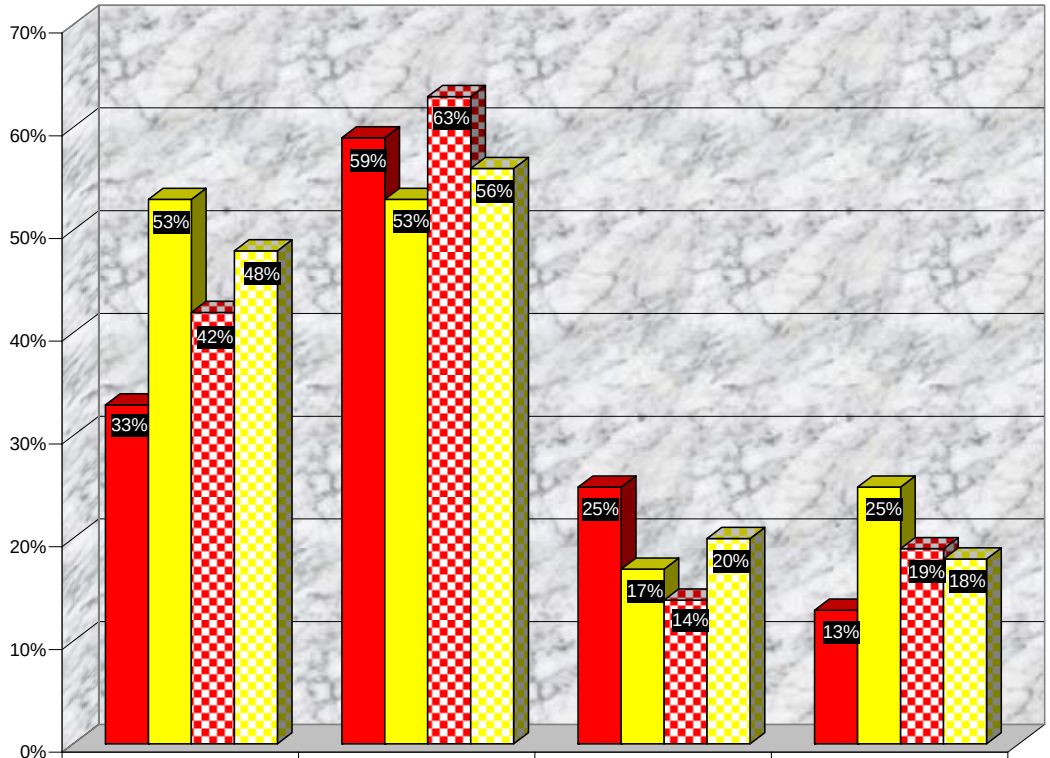


	B.16: In last 5 yrs. Influence of Elders - Decreased	B.17: In last 5 yrs. Respect for Elders - Decreased	B.18: In last 5 yrs. Amount of [Food] Sharing with Elders - Decreased
Barrow Elders	33%	29%	29%
Kak./Nuiq. Elders	33%	39%	11%
Savoonga Elders	46%	33%	11%
Barrow Non-Elders	39%	28%	8%
Kak./Nuiq. Non-Elders	25%	24%	5%
Savoonga Non-Elders	68%	55%	15%

Note: Due to the low sample sizes for elders in Kaktovik and Nuiqsut, the responses from these communities were combined.

Figure 5-5. Household Survey – Questions B.7, B.8.b, B.11, B.12 Subsistence Resource Use – NSB Communities

B.7. During the last year about how much of your subsistence foods came from hunting, fishing, and gathering activities from members of your household? None, One-quarter, One-half, Three-quarters, Almost all, Don't know
B.8.b. Why do you purchase these foods? Poor hunting season, Regular part of diet, Preference, Don't know, Other (explain)
B.11. Over the past 5 years, has the amount of subsistence foods your household receives from other households increased, remained the same, or decreased? Increased, Remained the same, Decreased, Don't know
B.12. Over the past 5 years, has the amount of subsistence foods your household has given to other households increased, remained the same, or decreased? Increased, Remained the same, Decreased, Don't know



	B.7: None/One-Quarter Diet from Subsistence (inside household)	B.8.b: Purchased Food Regular Part of Diet	B.11: Amount of Subsistence Foods Received - Decreased	B.12: Amount of Subsistence Foods Given - Decreased
Barrow Elders	33%	59%	25%	13%
Kak./Nuiq. Elders	53%	53%	17%	25%
Barrow Non-Elders	42%	63%	14%	19%
Kak./Nuiq. Non-Elders	48%	56%	20%	18%

Note: Due to the low sample sizes for elders in Kaktovik and Nuiqsut, the responses from these communities were combined.

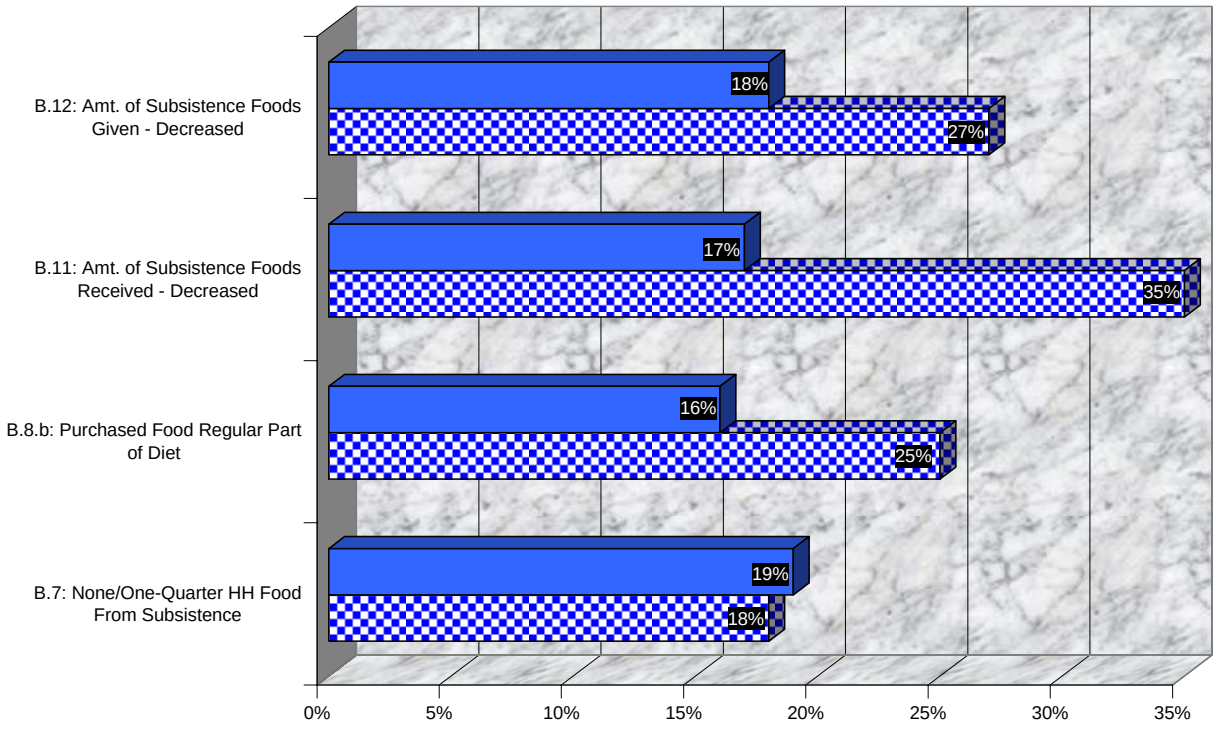
Figure 5-6. Household Survey – Questions B.7, B.8.b, B.11, B.12 Subsistence Resource Use – Savoonga

B.7. During the last year about how much of your subsistence foods came from hunting, fishing, and gathering activities from members of your household? None, One-quarter, One-half, Three-quarters, Almost all, Don't know

B.8.b. Why do you purchase these foods? Poor hunting season, Regular part of diet, Preference, Don't know, Other (explain)

B.11. Over the past 5 years, has the amount of subsistence foods your household receives from other households increased, remained the same, or decreased? Increased, Remained the same, Decreased, Don't know

B.12. Over the past 5 years, has the amount of subsistence foods your household has given to other households increased, remained the same, or decreased? Increased, Remained the same, Decreased, Don't know



	B.7: None/One-Quarter HH Food From Subsistence	B.8.b: Purchased Food Regular Part of Diet	B.11: Amt. of Subsistence Foods Received - Decreased	B.12: Amt. of Subsistence Foods Given - Decreased
Savoonga Elders	19%	16%	17%	18%
Savoonga Non-Elders	18%	25%	35%	27%

Note: HH = household

Questions B.11 and B.12 examined perceived changes in the amount of subsistence foods exchanged among households. A majority of the elders in all the project communities said the amount of sharing of subsistence foods has remained the same or increased over the past 5 years, although one-quarter of Barrow elders feel that the amount of subsistence foods they receive from other households has decreased. A majority of the non-elders in all communities also believe that the amount of sharing of subsistence foods has remained the same or increased. However, a relatively high percentage of Savoonga's non-elders reported a decline in both the amount of subsistence foods shared with them and the amount of subsistence food they give to other households. Perhaps the heavy reliance of Savoonga households on subsistence resources to meet dietary needs makes Savoonga non-elders especially sensitive to changes in the sharing of these resources.

Two questions in the household survey examined the social interaction that occurs with sharing of meals and visiting with friends and relatives (Table 5-17). Survey participants noted that subsistence products are nearly always a key ingredient in any shared meal. A sizeable majority of the elders and non-elders in all the project communities do not perceive any decrease in the sharing of meals with a relative or friend who lives in another household. A majority of the elders and non-elders also report that their visiting with friends or relatives has not decreased. However, possibly as a result of increased infirmities, about one-third of the elders report a decrease in visiting.

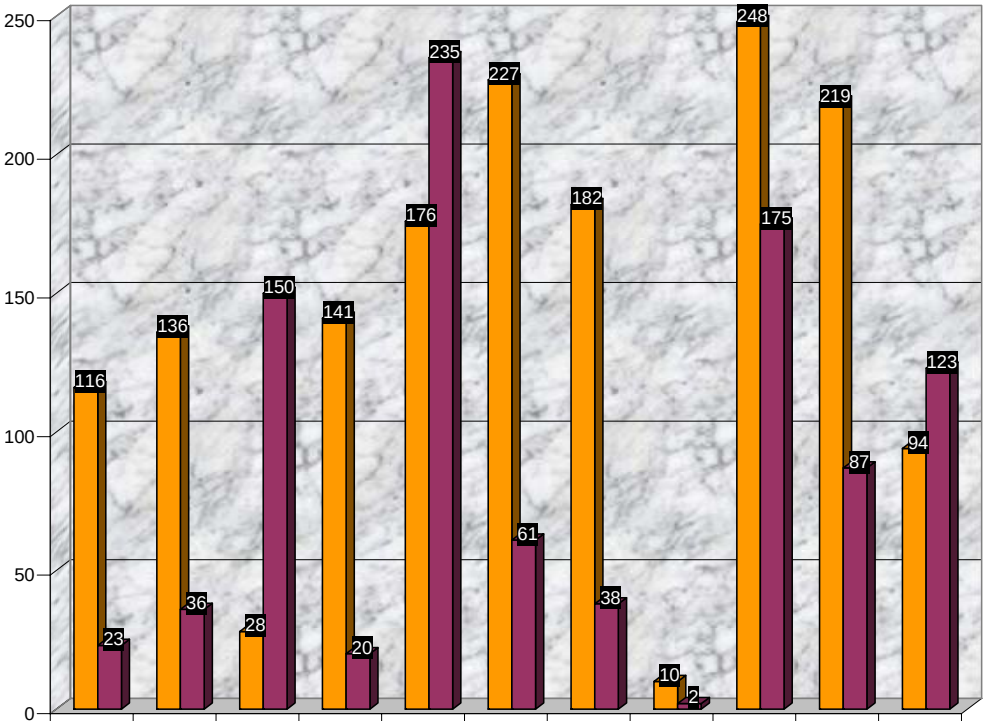
Table 5-17. Household Survey – Questions B.14, B.15, B.18
Sharing of Meals and Visiting – All Communities

B.14. In the last 5 years, has the number of meals you have eaten with a relative or friend who lives in another household: Increased, Remained the same, or Decreased?
B.15. During the last 5 years, has your visiting with friends or relatives: Increased, Remained the same, or Decreased?

	Barrow % Non-Elders	Barrow % Elders	Kak./Nuiq. % Non-Elders	Kak./Nuiq. % Elders	Savoonga % Non-Elders	Savoonga % Elders
B.14 Meals Shared with Relatives - Decreased	22%	23%	10%	22%	17%	13%
B.15 Visits with Friends/Relatives - Decreased	26%	32%	21%	28%	13%	32%

Based on household survey data, Figure 5-7 shows the participation levels of the residents of the NSB communities in a variety of subsistence activities. Survey participants were questioned about their participation and the participation of other household members in each activity over the preceding 12 months. Given that the sample sizes of males and females are nearly equal, sample sizes are used for comparison rather than percentages. As indicated in the figure, most subsistence activities are characterized by a marked gender division of labor. Whaling, hunting, trapping, and making sleds are predominately male activities, while mainly females sew skins for whaling boats. However, there are exceptions; for example, a particularly large number of the residents of the NSB communities engage in fishing (including the various tasks required at fish

Figure 5-7. Household Survey – Question B.2
Participation in Subsistence Activities – NSB Communities



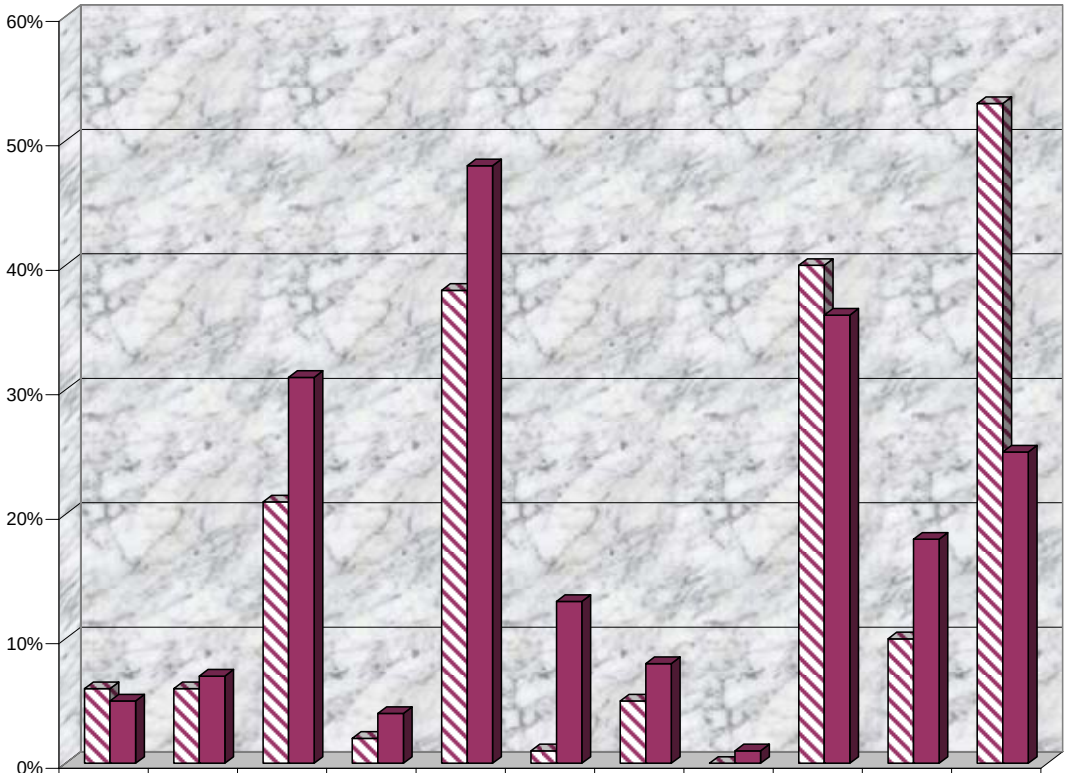
	Spring Whaling	Fall Whaling	Sew Skins	Make Sleds	Cook / Process	Hunt Land Mammal	Hunt Sea Mammal	Trap	Fish	Birds & Eggs	Plants
# Individuals Male (n=502)	116	136	28	141	176	227	182	10	248	219	94
# Individuals Female (N=486)	23	36	150	20	235	61	38	2	175	87	123

Note: Survey respondents may have reported that they participate in more than one activity.

camp), regardless of their gender. Other activities in which the gender ratios are roughly equivalent include the gathering of wild plants and cooking/processing. However, the estimate of male participation in plant gathering may be inflated because nearly everyone gathers berries at least once during the year. With respect to cooking/processing, it is likely that men perform some processing through initial field dressing of harvested animals, while women complete the processing and perform most of the cooking.

Figure 5-8 compares the subsistence participation levels of women in the NSB communities with those of Savoonga women. The participation levels are roughly similar for most activities, although there are some notable differences such as the high participation by Savoonga women in the gathering of wild plants and berries and the comparatively high involvement by NSB community women in the hunting of land mammals. These differences may reflect the relative availability of different types of subsistence resources. For example, there is a wider range of terrestrial game species on the North Slope than on St. Lawrence Island.

Figure 5-8. Household Survey – Question B.2
Percent of Female Participation in Subsistence Activities – All Communities

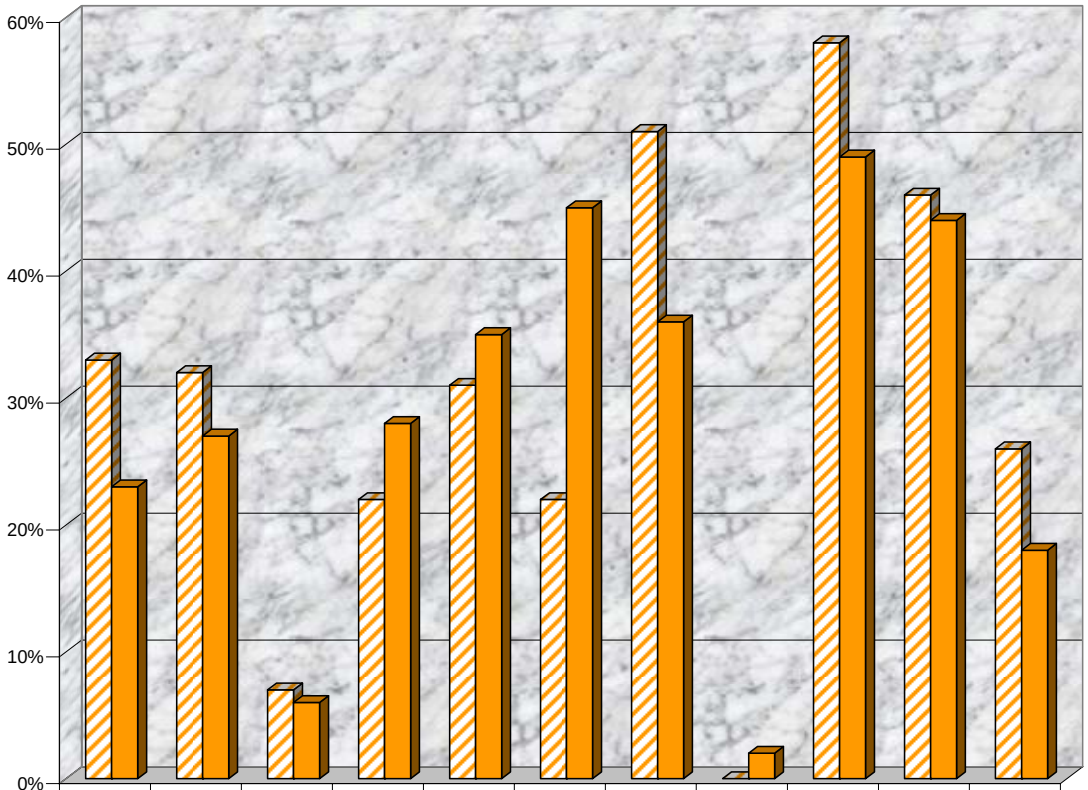


	Spring Whaling	Fall Whaling	Sew Skins	Make Sleds	Cook / Process	Hunt Land Mammal	Hunt Sea Mammal	Trap	Fish	Birds & Eggs	Plants
Savoonga Females	6%	6%	21%	2%	38%	1%	5%	0%	40%	10%	53%
NSB Females	5%	7%	31%	4%	48%	13%	8%	1%	36%	18%	25%

Figure 5-9 compares the subsistence participation levels of men in the NSB communities with those of Savoonga men. As with the women, the participation levels are roughly equal for most activities.

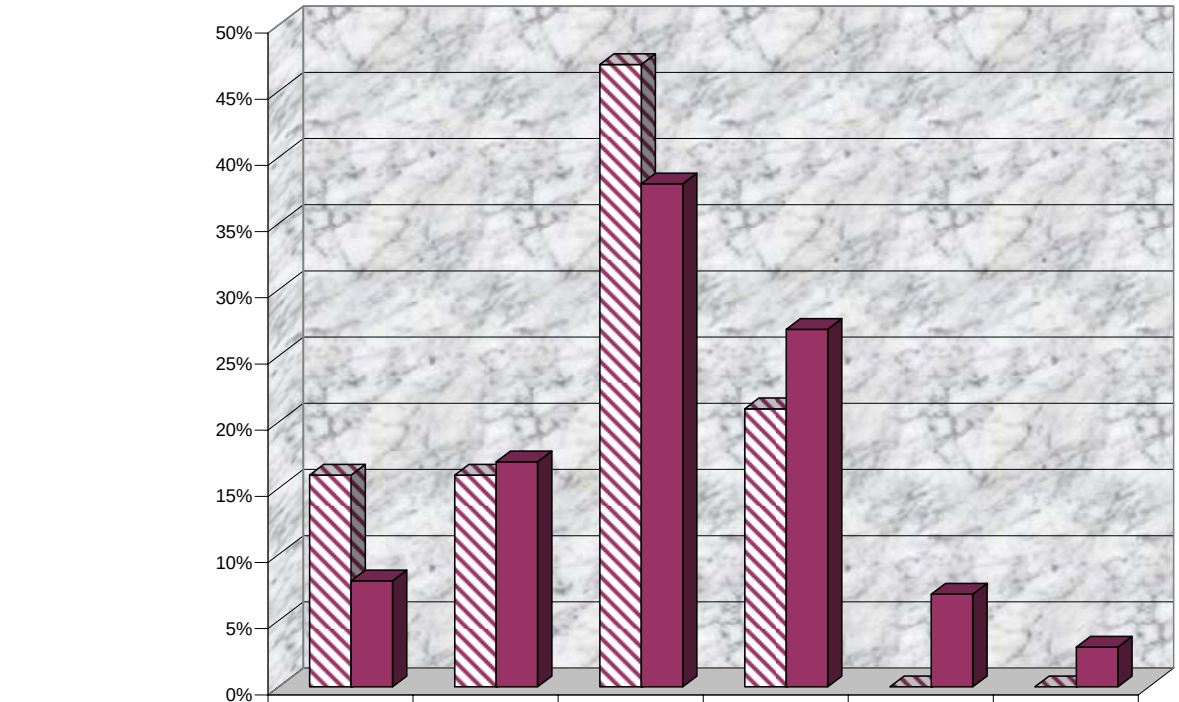
To determine whether the skills (and interest) required to engage in subsistence activities are being passed on to the younger generation, age-specific rates of subsistence participation were analyzed. As shown in Figure 5-10 through Figure 5-14, the age group participation levels of females in selected subsistence activities are similar between the NSB communities and Savoonga. There are a few significant differences; more very young females in Savoonga are harvesting birds and eggs and fishing than in the NSB communities, while more early adolescent females in the NSB communities are engaging in skin sewing than in Savoonga. The reasons for the differences in harvesting birds and eggs and fishing are uncertain, but the dissimilarity in skin sewing may be the result of the concerted effort by North Slope women to teach these sewing skills to the younger generation. For example, Chapter 4 describes programs initiated by the Barrow Whaling Captains Auxiliary to teach skin sewing skills.

Figure 5-9. Household Survey – Question B.2
Percent of Male Participation in Subsistence Activities – All Communities



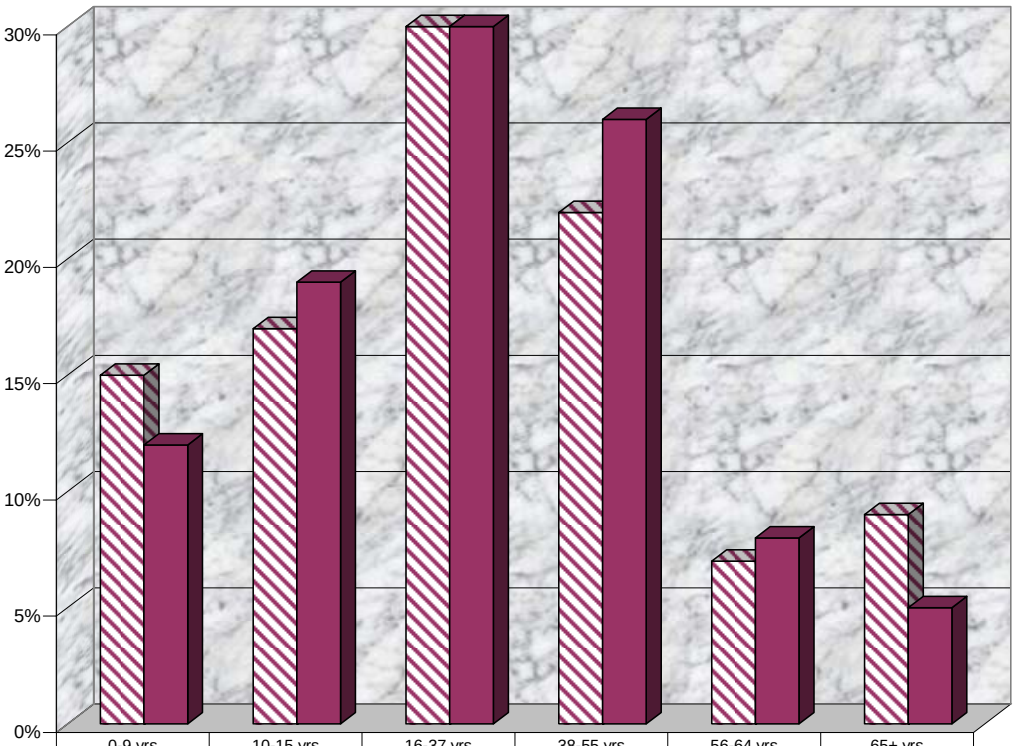
	Spring Whaling	Fall Whaling	Sew Skins	Make Sleds	Cook / Process	Hunt Land Mammal	Hunt Sea Mammal	Trap	Fish	Birds & Eggs	Plants
Savoonga Males	33%	32%	7%	22%	31%	22%	51%	0%	58%	46%	26%
NSB Males	23%	27%	6%	28%	35%	45%	36%	2%	49%	44%	18%

Figure 5-10. Household Survey – Question B.2
Percent of Female Participation in Bird and Egg Gathering by Age – All Communities



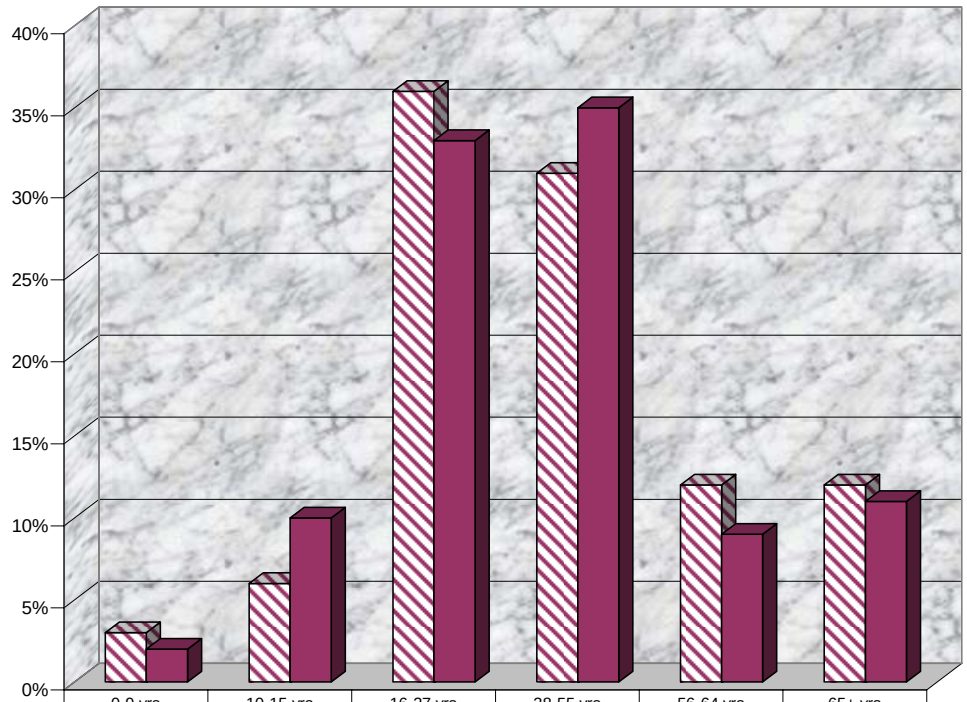
	0-9 yrs	10-15 yrs	16-37 yrs	38-55 yrs	56-64 yrs	65+ yrs
Savoonga Females Birds & Eggs	16%	16%	47%	21%	0%	0%
NSB Females Birds & Eggs	8%	17%	38%	27%	7%	3%

Figure 5-11. Household Survey – Question B.2
Percent of Female Participation in Gathering Plants by Age– All Communities



	0-9 yrs	10-15 yrs	16-37 yrs	38-55 yrs	56-64 yrs	65+ yrs
Savoonga Females Plants	15%	17%	30%	22%	7%	9%
NSB Females Plants	12%	19%	30%	26%	8%	5%

Figure 5-12. Household Survey – Question B.2
Percent of Female Participation in Cooking and Processing by Age – All Communities

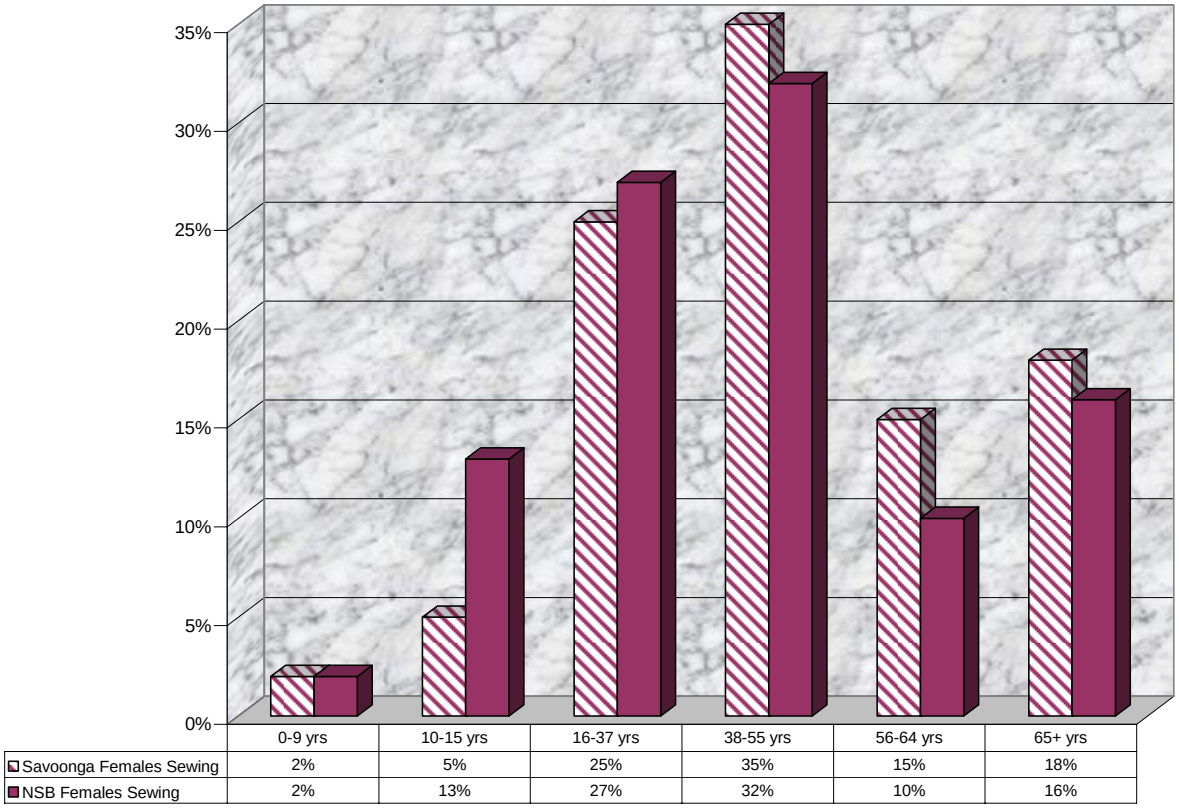


	0-9 yrs	10-15 yrs	16-37 yrs	38-55 yrs	56-64 yrs	65+ yrs
Savoonga Females Cook/Process	3%	6%	36%	31%	12%	12%
NSB Females Cook/Process	2%	10%	33%	35%	9%	11%

Figure 5-13. Household Survey – Question B.2
Percent of Female Participation in Fishing by Age – All Communities

	0-9 yrs	10-15 yrs	16-37 yrs	38-55 yrs	56-64 yrs	65+ yrs
Savoonga Females Fishing	23%	26%	30%	17%	4%	0%
NSB Females Fishing	11%	17%	35%	25%	6%	6%

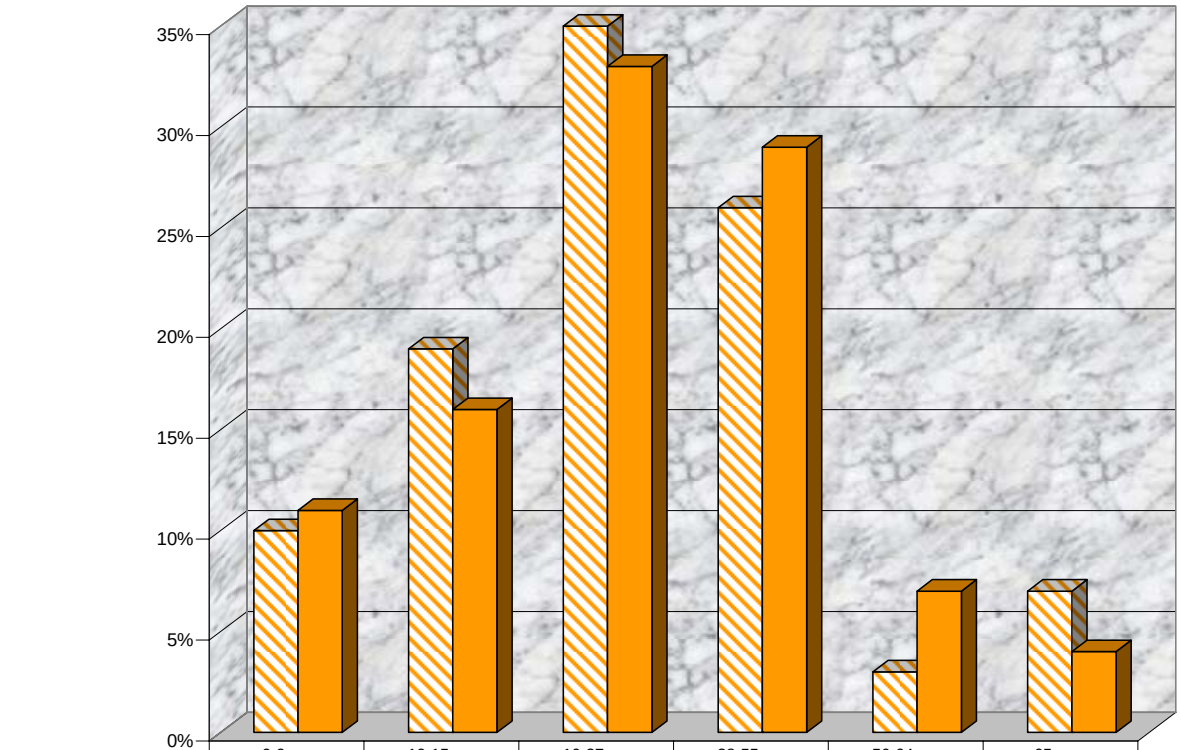
Figure 5-14. Household Survey – Question B.2
Percent of Female Participation in Sewing Skins by Age – All Communities



	0-9 yrs	10-15 yrs	16-37 yrs	38-55 yrs	56-64 yrs	65+ yrs
Savoonga Females Sewing	2%	5%	25%	35%	15%	18%
NSB Females Sewing	2%	13%	27%	32%	10%	16%

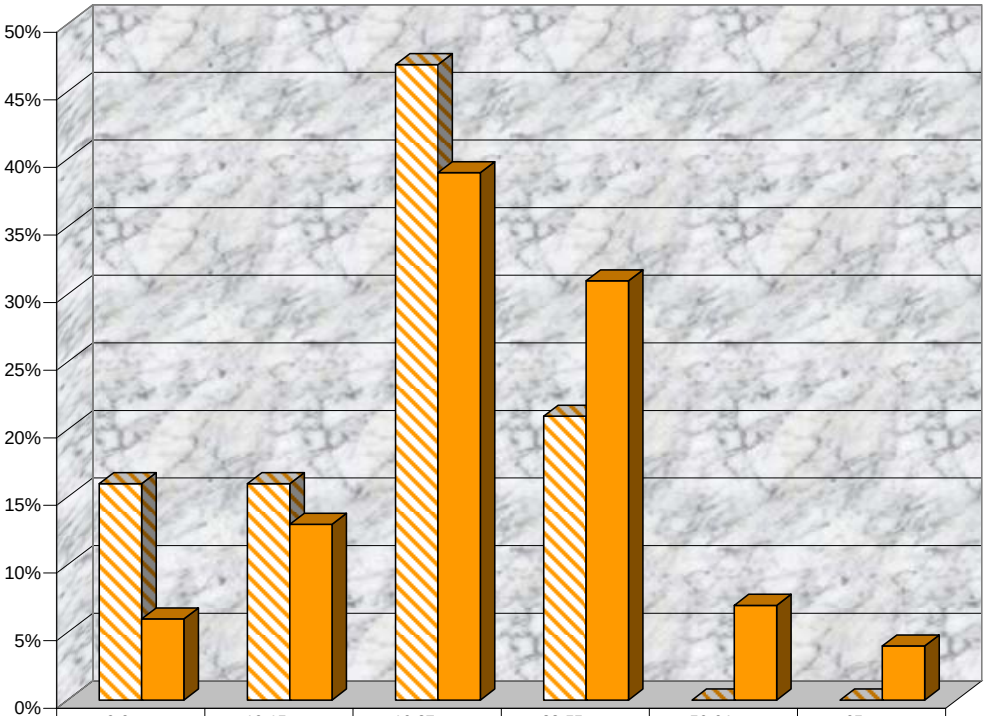
The same type of age group comparative analysis was also applied to male participation in selected subsistence activities. As shown in Figure 5-15 through Figure 5-19, there are few major differences, in any age category, between the subsistence participation of males in the NSB communities and Savoonga. An especially significant finding is the similarity between Barrow and Savoonga with respect to spring whaling participation rates in each age category (Figure 5-19), suggesting the continuing cultural importance of whaling in the Barrow despite recent sociocultural changes related to nearby oil and gas development.

Figure 5-15. Household Survey – Question B.2
Percent of Male Participation in Fishing by Age – All Communities



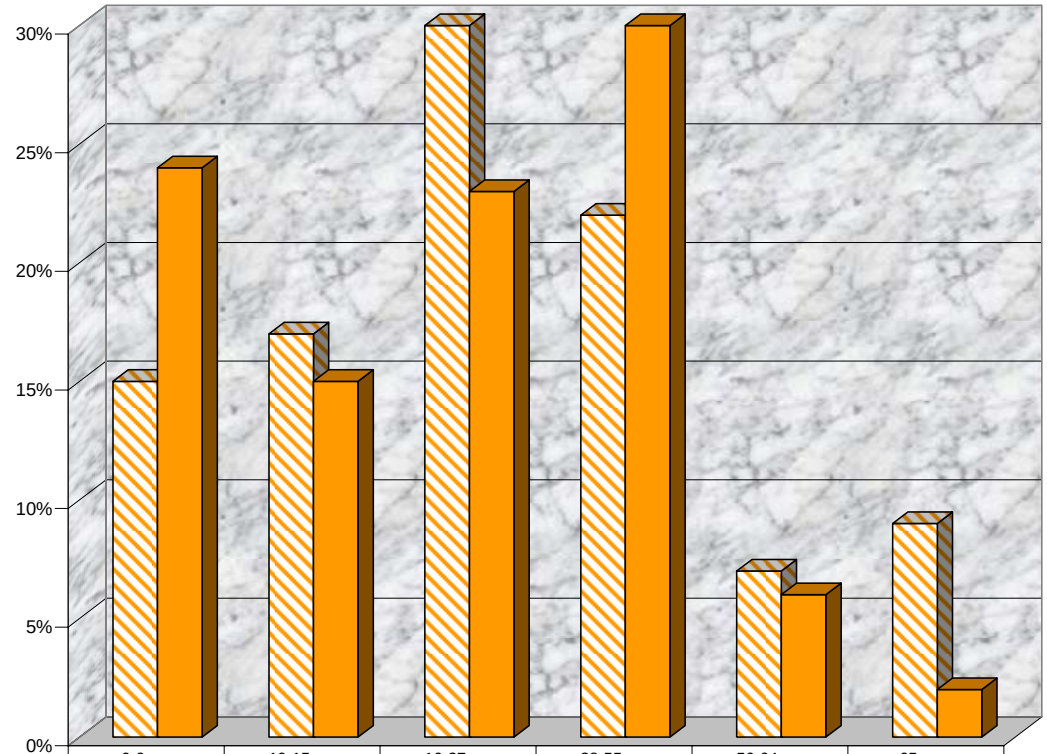
	0-9 yrs	10-15 yrs	16-37 yrs	38-55 yrs	56-64 yrs	65+ yrs
Savoonga Males Fishing	10%	19%	35%	26%	3%	7%
NSB Males Fishing	11%	16%	33%	29%	7%	4%

Figure 5-16. Household Survey – Question B.2
Percent of Male Participation in Harvesting Birds and Eggs by Age – All Communities



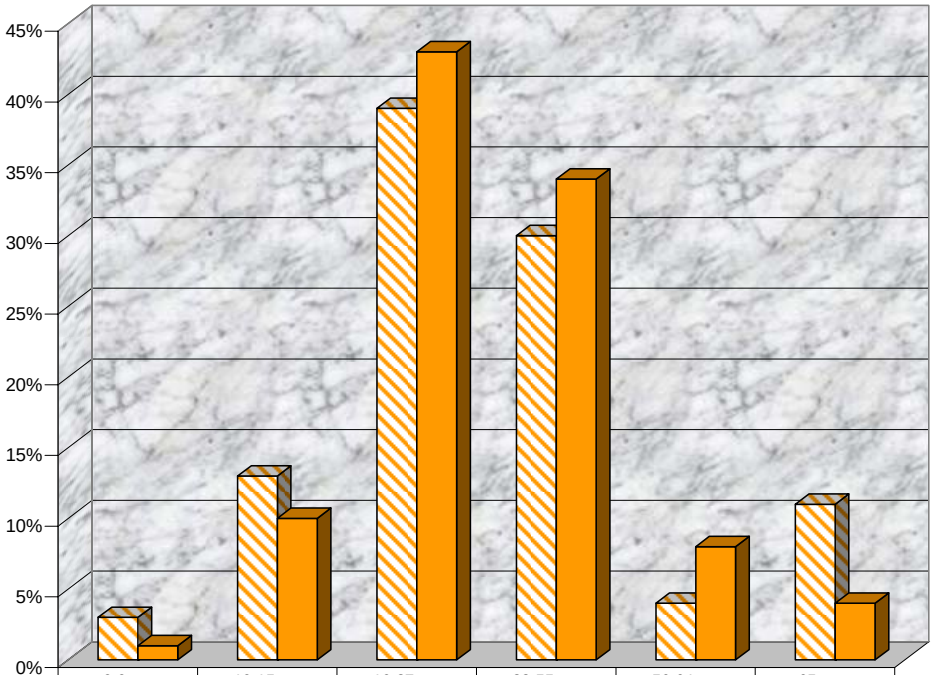
	0-9 yrs	10-15 yrs	16-37 yrs	38-55 yrs	56-64 yrs	65+ yrs
Savoonga Males Birds & Eggs	16%	16%	47%	21%	0%	0%
NSB Males Birds & Eggs	6%	13%	39%	31%	7%	4%

Figure 5-17. Household Survey – Question B.2
Percent of Male Participation in Harvesting Plants and Berries by Age – All Communities



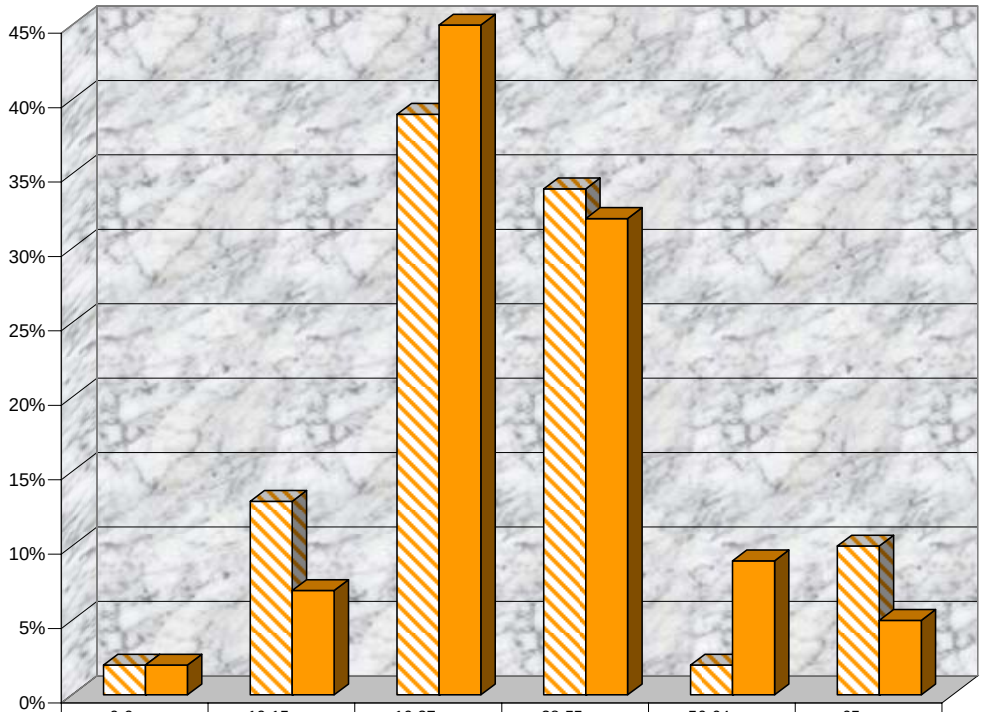
	0-9 yrs	10-15 yrs	16-37 yrs	38-55 yrs	56-64 yrs	65+ yrs
Savoonga Males Plants	15%	17%	30%	22%	7%	9%
NSB Males Plants	24%	15%	23%	30%	6%	2%

Figure 5-18. Household Survey – Question B.2
Percent of Male Participation in Marine Mammal Hunting by Age – All Communities



	0-9 yrs	10-15 yrs	16-37 yrs	38-55 yrs	56-64 yrs	65+ yrs
Savoonga Male Sea Mammal Hunting	3%	13%	39%	30%	4%	11%
NSB Male Sea Mammal Hunting	1%	10%	43%	34%	8%	4%

Figure 5-19. Household Survey – Question B.2
Percent of Male Participation in Spring Whaling by Age – Barrow and Savoonga



	0-9 yrs	10-15 yrs	16-37 yrs	38-55 yrs	56-64 yrs	65+ yrs
Savoonga Male Spring Whaling	2%	13%	39%	34%	2%	10%
NSB Male Spring Whaling	2%	7%	45%	32%	9%	5%

5.6 CONCLUSIONS AND DISCUSSION

This section summarizes the most significant or interesting of the findings presented in Chapter 5. In addition, where possible these findings are compared to those of previous survey research. In particular, this section compares the major findings of the current surveys with the results of a survey conducted by ISER in 1977 (Kruse 1982).[9] The results of this comparison should be treated with caution because of differences between the surveys with respect to the NSB communities surveyed and wording of survey questions. Nevertheless, the comparison offers an approximation of how people's attitudes, perceptions, and behavior have changed over a three-decade time span.

[9] ISER, in collaboration with the North Slope Borough, conducted the household survey in Barrow, Kaktovik, Nuiqsut, Wainwright, Anaktuvuk Pass, and Point Hope as part of the National Science Foundation's Man in the Arctic Program. A structured interview approach was used to collect information on subsistence, employment, and community perceptions. The final sample consisted of 290 persons (75% of the adults contacted), and represented 21% of the adult population (Kruse 1982).

Despite the economic hardships that the NSB communities and Savoonga are currently experiencing, most residents feel that the quality of life for their household has either stayed the same or improved. However, a large percentage of Barrow elders are pessimistic about the trend in the quality of life in their community; this negative assessment is likely the result of a perceived lack of jobs, increase in substance abuse and crime, and erosion of traditional values. On the other hand, most Barrow elders, and the majority of elders in all other project communities, do not believe that their community has become worse as a place to live. Similar sentiments were expressed in the 1977 ISER survey; at that time, many North Slope Iñupiat noted that aspects of village life had worsened, but only 9% expressed dissatisfaction with the NSB as a place to live.

With regard to whaling captains' perceptions of the impacts of oil and gas development on Iñupiaq whaling, industry activity is designated as the major factor in the disturbance of bowhead migration patterns during the fall whaling season. The main change is deflection of the whales farther offshore by noise and other disturbances. This viewpoint is shared by whaling captains in Barrow as well as those in Kaktovik and Nuiqsut, which are completely dependent on the fall migration and which are the communities closest to oil industry activities. However, changes in the spring bowhead migration pattern are largely attributed to climate change. Changes noted by whaling captains in Savoonga, where no oil and gas development has occurred, include earlier arrival of the whales in the spring and an increase in the number of whales during the fall. Some Savoonga respondents attribute changes in both the spring and fall whale migration patterns to climate change, but most did not offer a reason for the changes reported.

The high percentage (59%) of surveyed whaling captains who responded that oil and gas development had a neutral effect or responded that they "don't know" suggests that many whaling captains have mixed feelings about the effects of this development. On the positive side, respondents commented on the increased availability of good jobs, higher household incomes, and tax revenues for NSB social services and capital infrastructure projects. Comments on the negative aspects of oil and gas development included increased difficulties in engaging in subsistence activities due to environmental disturbances and high levels of alcoholism and drug abuse. According to the 1977 ISER survey, 30 years ago the North Slope Iñupiat were similarly undecided about whether, all things considered, oil and gas development was good or bad for their region; one-third said they did not know whether the development had been good or bad. The remaining two-thirds were equally divided into those who thought oil and gas development had been good, those who thought it had been bad, and those who believed it had been both good and bad.

Over two-thirds (69%) of the surveyed whaling captains in the NSB communities believe it is not possible to have oil drilling in offshore coastal areas and at the same time provide adequate safeguards to protect the environment and important cultural activities. The 1983 observation of Kruse et al. (1983), that "fears that offshore development will inevitably harm subsistence resources are both intense and widespread and themselves constitute an impact of development," is still true. However, the current survey found that whaling captains in Savoonga are less pessimistic, with only 28% of them indicating that OCS development is incompatible with environmental protection and cultural activities.

On the other hand, more than half of the whaling captains surveyed are confident about their community's capability to influence offshore as well as onshore oil and gas development. Perhaps this optimistic assessment is related to a perceived growing responsiveness by the oil industry to local concerns. For example, in comments following this question Barrow and Kaktovik whaling captains noted:

> *Conditions have been placed on offshore development. They* [the oil industry] *understand pretty well what we are doing out there. There is better communication with industry. They inform us of their activities through public hearings, etc.*
>
> *Villagers have long expressed a preference for onshore development; the companies have become more adaptable and addressed village concerns such as reducing impacts on caribou migration.*

However, there are also many whaling captains who are less hopeful about their community's capability to influence oil and gas development. As one survey participant stated:

> *They* [the oil industry] *just go through the motions of cooperating with us.*

With regard to changes in the influence, respect, and amount of sharing that elders experience, many Savoonga non-elders are concerned about changes in the role of elders, with 68% stating the influence of elders has decreased and 55% stating that respect for elders has declined. Fewer non-elders in the NSB communities expressed these concerns. Only a small percentage of the non-elders in the project communities indicated that sharing with elders, a traditional sign of respect, has declined. With regard to the perceptions of elders themselves, 46% of Savoonga elders and 33% of NSB community elders feel that their influence has diminished. A relatively high percentage (29%) of Barrow elders reported a decline in sharing. A recent study conducted in the NANA region to the immediate southwest of the North Slope Borough also found that many Iñupiaq elders, even those residing in a household that supplied all their subsistence needs, provided strong responses to feelings of "food insecurity." Further investigation revealed that the real concern at least among some elders is whether young men and women are being taught how to be successful in subsistence activities, where "success" is measured in terms of propensity to share as well as proficiency in harvesting. Nor was this concern strictly related to elders worrying about being provided for in their advanced years; it also revolved around their fear that the younger generation was not committed to central Iñupiaq values that would ensure their literal survival in a changing world (Don Callaway, personal communication 2007; Smith 2006).

As discussed in Chapter 4, the subsistence lifestyle is central to the cultural and community identity of the North Slope Iñupiat and St. Lawrence Islanders. One of the primary aims of this research was to explore whether and how modern processes that enable North Slope residents to engage in mainstream American cultural life also affect the manner and degree of participation in traditional subsistence practices, especially the participation of village youth. The survey results indicate that, in comparison to the traditional Siberian Yup'ik community of Savoonga, households in the NSB communities depend less on subsistence resources (and therefore more on store-bought foods) to meet their nutritional needs. However, the survey results also revealed

that the level of recruitment of young women and men into subsistence tasks in the NSB communities does not appear to be substantially different from that of their counterparts in Savoonga. Most notably, Barrow and Savoonga are similar in terms of age group participation in spring whaling. For some other subsistence activities there are dissimilarities in the amount of participation when comparing various age categories across villages; however, some of this variation may be due to inter-village differences in the availability of certain subsistence resources.

Subsistence participation in the NSB communities can also be examined over time by comparing the results of the whaling captain survey with those of the 1977 ISER survey. As shown in Table 5-18, the participation of North Slope Iñupiaq adults in subsistence activities and the sharing of subsistence products among households have changed little over three decades. However, the percentages forming the basis of this comparison are based on largely qualitative measures of subsistence participation and a more detailed assessment of trends in the *amount* of subsistence resources harvested and used by North Slope Iñupiaq households will require the periodic application of more quantitative research methods such as those employed by the Community Profile Database project administered by the ADF&G (see Section 5.7.1 for a description of further research needs). One notable change in subsistence use between 1977 and the current study is the percentage of households that got half or more of their household foods through subsistence activities. This decrease in 9 percentage points is surprising, considering that overall participation in subsistence activities has either increased or stayed constant since Kruse's survey in 1977. The results of the current survey do not suggest, however, if this drop in households that get half or more of their household food from subsistence activities is a result of overall larger food stores over the course of a year (creating a situation where, despite a constant subsistence base, the percentage of the total yearly food assemblage would be less), decreased intense engagement in subsistence activities by households (with a wider distribution of *some* engagement among households), or changing socioeconomic forces in the community resulting in households replacing foods gathered historically through subsistence means with store-bought alternatives.

Table 5-18. A Comparison of North Slope Iñupiaq Participation in Subsistence Activities – 1977 and Present Survey

	1977 (Kruse 1982)	Present Whaling Captain Survey
Percent of All Adults Who Participated in Hunting, Fishing or Craftmaking	70%	71%
Percent of Adult Males Who Participated in Hunting, Fishing or Craftmaking	75%	75%
Percent of Adult Females Who Participated in Hunting, Fishing or Craftmaking	60%	66%
Percent of Households Using Some Subsistence Foods	80%	85%
Percent of Households that got Half or More of Household Food through Subsistence Activities	40%	31%
Percent of Households that Obtained Subsistence Foods from Other Households	75%	79%

5.7 RECOMMENDATIONS

5.7.1 Additional Analysis of Existing Data Set

As discussed in Chapter 2, it was not possible to make full use of the extensive responses to open-ended questions in the household, whaling captain, and student surveys due to resource limitations. A systematic analysis of these responses would further document and categorize the observations of whaling captains, elders, youths, and others regarding changes in traditional values, knowledge, and practices that have resulted from oil and gas development and other external or internal forces.

5.7.2 Further Research Needs

Recommended areas for future research include the following:

a) The views of the younger generation in the NSB communities have largely been ignored by researchers. The perceptions of young people are as much a result of life stage as they are of culture change. In like manner, different ages may have different perspectives on socio-economic change, such as change in income. As noted in Chapter 2, the data gathered from the student surveys administered in the current project could not be reliably used because of low sample sizes. It is hoped that future research will be better able to accurately record the attitudes of the youth in the NSB communities toward the social, cultural, and economic impacts of oil and gas development and other agents of change.

b) There is continuing uncertainty about the extent of dependence of the NSB communities on food acquired through subsistence hunting and fishing. The survey findings in this report provide only a broad overview of participation in subsistence activities. The results of more in-depth studies, such as the subsistence harvest surveys conducted by the ADF&G, are outdated for the NSB communities (as shown in Chapter 4, the subsistence activity of the NSB communities has not been surveyed by the ADF&G since the late 1980s or early 1990s). Further study of the contribution subsistence resources make toward the diet of an average household on the North Slope would enable the MMS to grasp the magnitude of the risk associated with any OCS development effort that might impact the continuity and availability of these resources.

5.7.3 Development of an Overall Research Plan for the NSB

For over three decades the communities in the NSB have been the focus of a large number of survey research efforts. ISER, MMS, the National Science Foundation, and the NSB government have collected extensive data from households in these communities. However, various inconsistencies across data sets greatly reduce the usefulness of this data for time series analysis or synchronic, cross-sectional analysis. To avoid the reoccurrence of this problem, it is recommended that all future household data collection in the NSB communities be conducted under an integrated research planning initiative that provides flexibility for individual research

interests while at the same time contributing to a consistent and comprehensive data set. A comprehensive research plan would aim to:

a) Integrate survey research efforts by using unique household identifiers. This would allow the economic, employment, and attitude data collected by research group "A" to be linked with the subsistence harvest data collected by research group "B," thereby lowering the burden on survey participants and expanding the utility of both data sets by allowing co-variation to be measured among all variables.

b) Develop a protocol for survey research that will create consistency between data sets. For example, some of the exact same questions should be incorporated in all survey questionnaires. This will help ensure the provision of data that can be used for comparison with any previously collected data for the purpose of identifying any significant social, economic, and cultural changes in the communities studied and helping to identify the causes of such changes.

c) Apply multi-method approaches in selected communities to derive the most value from the information collected**.** For example, oral histories often provide rich contextual data that inform interpretation of survey research results.

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CHAPTER 6
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