

# Chapter Four: Current and Projected Uses in the Lease Sale Area

## Table of Contents

A. Historical Background.....	4-1
B. North Slope Borough and Communities in and Near the Lease Sale Area.....	4-2
1. North Slope Borough .....	4-2
2. Anaktuvuk Pass .....	4-2
3. Barrow .....	4-4
4. Kaktovik .....	4-5
5. Nuiqsut .....	4-7
6. Prudhoe Bay/Deadhorse .....	4-8
C. Subsistence.....	4-8
1. The Meaning and Protection of Subsistence Values.....	4-9
2. Subsistence and the Mixed-cash Economy.....	4-10
3. Seasonal Cycle of Economic Activity and Subsistence Use Areas .....	4-11
4. Harvest Levels of Plants, Fish, and Game; Species Variety; and Participation Levels .....	4-17
D. Commercial and Sport Fishing .....	4-19
E. Sport Hunting, Guiding, and Outfitting.....	4-19
1. Brown bear .....	4-20
2. Caribou .....	4-20
3. Moose .....	4-20
4. Wolf .....	4-20
5. Other Animals .....	4-21
F. Tourism and Recreation .....	4-21
G. Oil and Gas Extraction .....	4-22



# Chapter Four: Current and Projected Uses in the Lease Sale Area

## A. Historical Background

Evidence of human occupation and use of the Arctic coastal plain dates back to 10,000 BC. Marine mammal harvesting on winter sea ice has occurred for at least 4,000 years, and evidence of whaling is 3,400 years old (Langdon, 1996). The record of human existence on the North Slope is characterized by several distinct cultural periods marked by changes in tool style (NSBCMP, 1984a). The environmental characteristics of the Arctic shaped Inupiat culture into a semi-nomadic society with a tradition of whaling and an emphasis on seasonal inland hunting. This pattern of land use remained unchanged until the second half of the 19th century with the arrival of westerners and new tools, along with natural events, such as caribou population decline (NSBCMP, 1984a; NSB, 1979).

Numerous sites across the North Slope containing sod houses, graves, storage pits, ice cellars, bones, and relics attest to the historical use and presence of Arctic people in the proposed sale area; however, much of the archaeological record has been destroyed by erosion (Hoffman, et al., 1988). For centuries, trading centers at the mouth of the Colville River, like Barter Island and Nigalik, were used by Canadian and Alaska Inupiat (Jacobson and Wentworth, 1982). North Slope Inupiat also traded with Asia across the Bering Strait as early as the mid-1700s (Langdon, 1996; NSBCMP, 1984a).

European explorers and fur traders began arriving in the proposed sale area in the 1820s and 30s. This contact introduced metal tools, traps, and guns to support trading and hunting. Russian trading posts were established from Norton Sound southward. After 1850 and into the 1880s, once bowhead whale paths were discovered, commercial whaling increased dramatically in the Arctic. Several whaling stations were built along the coast and provided regular contact and trading with Natives. Steamships replaced sailing vessels facilitating year-round access. Increased hunting pressure and a natural decline reduced the population of the western Arctic caribou herd. This, coupled with western diseases like measles and influenza, resulted in an increase in the death rate of the inland Inupiat. Coastal Inupiat also suffered population decline from foreign diseases (NSBCMP, 1984a).

By World War I, declining whale populations and decreased demand for whale oil and baleen brought an end to the commercial whaling period. However, demand for fur, particularly arctic fox, resulted in a continued presence of westerners along the Beaufort Sea coast and North Slope. Native residents engaged in trapping, which provided income from non-subsistence resources. By 1914, trapping camps used in the thriving fur trade were established from Barrow to the Canadian border (NSBCMP, 1984a; Hoffman, et al., 1988). In the 1930s, the price of fur plummeted, forcing many traders to leave the region near the lower Colville River. Many residents moved to other settlements in Alaska (Hoffman, et al., 1988).

World War II brought an influx of military personnel into Alaska and the petroleum exploration period began. Inupiat were hired to work on construction projects, including the Naval Arctic Research Laboratory near Barrow in 1947 and the Distant Early Warning (DEW) line defense sites in the early 1950s (NSBCMP, 1984a). The lower Colville River supported many families until 1950 when the Bureau of Indian Affairs required that children attend schools and most residents relocated to Barrow (NSB, 1979).

The contemporary period of modernization and change began in the 1960s. The discovery of the Prudhoe Bay Oil Field in 1967 prompted a renewed interest in petroleum exploration and development, but before oil reserves could be developed, Native land claims had to be settled. “In response to rapid change that threatened Native land rights through land transfers, biological resource limitations, and natural resource

leasing (primarily oil and gas), Inupiat political groups formed regional organizations to protect their rights and culture” (NSBCMP, 1984a). The Alaska Native Claims Settlement Act, passed in 1971, created village and regional Native corporations and provided a mechanism for the transfer of land ownership to Native Alaskans (NSBCMP, 1984a).

## B. North Slope Borough and Communities in and Near the Lease Sale Area

### 1. North Slope Borough

The North Slope Borough, incorporated in 1972, is Alaska’s largest borough, covering more than 15 percent of the state’s total land area. The area encompasses 88,817.1 square miles of land and 5,945.5 square miles of water. Communities located within the borough include: Anaktuvuk Pass, Atkasuk, Barrow, Deadhorse/Prudhoe Bay, Kaktovik, Nuiqsut, Point Hope, Point Lay, and Wainwright (ADCA, 2006). The borough is located within the Barrow Recording District.

In 2000, the population of the North Slope Borough was 7,385 (USCB, 2006). The majority of permanent residents are Inupiat, who have lived in the region for centuries. Traditional marine mammal hunts and other subsistence practices are a prevalent part of the culture (ADCA, 2006).

Oil exploration in the 1960s led to the development of Prudhoe Bay and construction of the Trans-Alaska Pipeline in the 1970s. The North Slope Borough government is funded primarily by oil tax revenues and provides public services to all of its communities. Local government is the largest employer of borough residents and the median household income is \$63,173 (USCB, 2000).

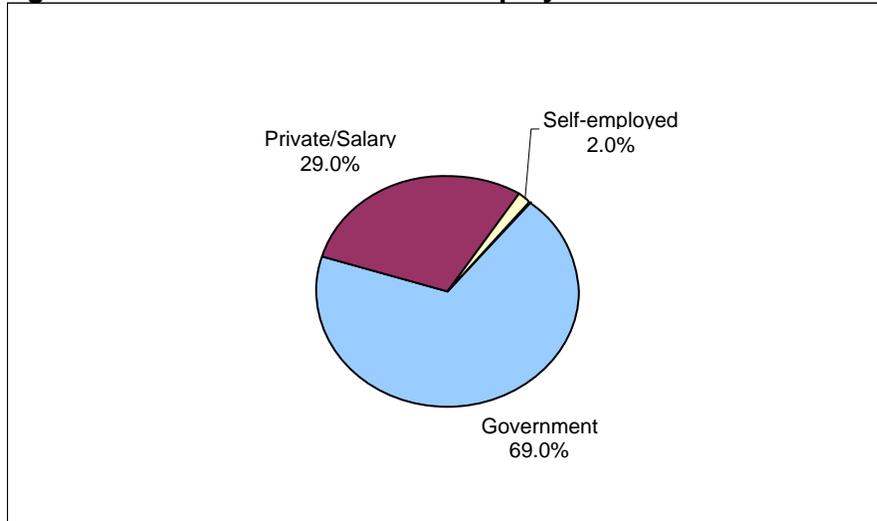
The borough’s climate is arctic, with temperatures ranging from -56 degrees Fahrenheit in the winter to 78 degrees Fahrenheit in the summer. Precipitation is light at 5 inches, with snowfall averaging 20 inches (ADCA, 2006).

### 2. Anaktuvuk Pass

Anaktuvuk Pass, which encompasses 4.8 square miles of land and 0.1 square miles of water, is located on the divide between the Anaktuvuk and John Rivers in the central Brooks Range. In 1926-1927, the Nunamiut left the Brooks Range and scattered due to the collapse of caribou and cultural changes brought by the influx of Western civilization. In 1938, several Nunamiut families left the coast and returned to the mountains at Killik River and Chandler Lake. In 1949, the Chandler Lake group moved to Anaktuvuk Pass (“the place of caribou droppings”), where they were later joined by the Killik River group. This settlement attracted Nunamiut from many other locations and the City of Anaktuvuk Pass was incorporated in 1959 (ADCA, 2006).

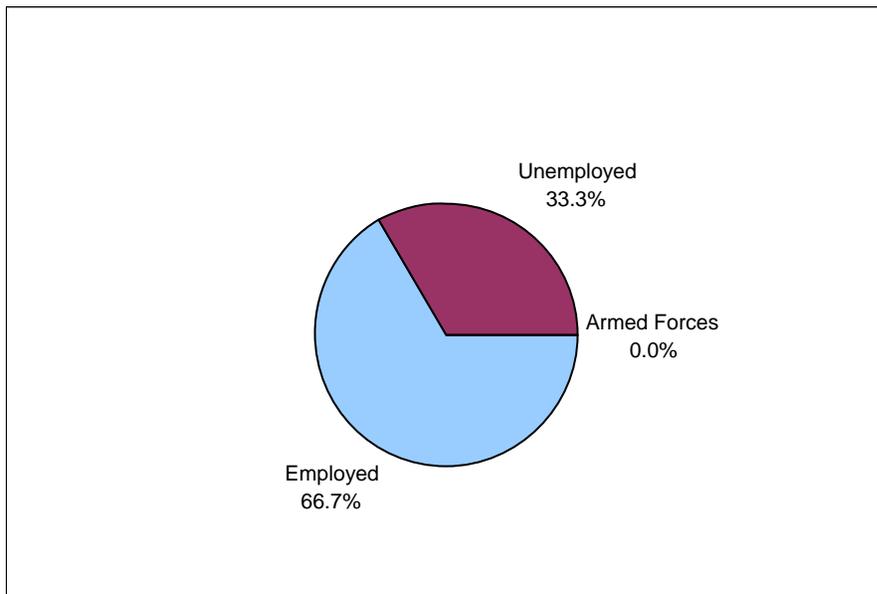
The population of Anaktuvuk Pass is 308 (DCCED, 2005). Like other communities within the North Slope Borough, Anaktuvuk Pass is dependent upon subsistence activities (ADCA, 2006). Economic and employment opportunities are limited due to the isolation of the community. Hunting and trapping for the sale of skins, guiding sport hunters, and craft-making provide some income. Seasonal employment is also available to some residents outside the community. The median household income in 1999 was \$52,500 (USCB, 2000). The following figures display Anaktuvuk Pass’ employment classes and employment rates from the year 2000.

**Figure 4.1 2000 Anaktuvuk Pass Employment Classes**



Source: (USCB, 2000)

**Figure 4.2 2000 Anaktuvuk Pass Employment Rate**



Source: (USCB, 2000)

The North Slope Borough provides utilities to Anaktuvuk Pass. Two central water wells and a treated watering point at the Nunamiut School provide water. Most water is delivered by truck to holding tanks and individual households. Approximately 80 percent of homes have running water in the kitchen. In 1996, construction began on a \$17 million project to provide piped water, sewer and household plumbing (ADCA, 2006).

The borough owns and operates a 4,800-foot gravel airstrip and year-round access is provided by air travel. Snowmachines are used for local transportation in winter months (ADCA, 2006).

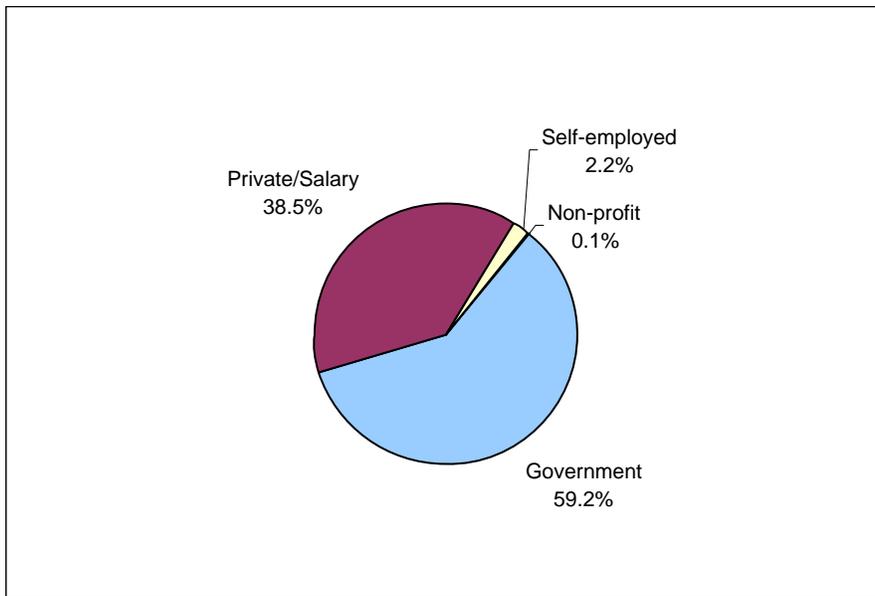
Anaktuvuk Pass' climate is continental and differs from the rest of the North Slope Borough. Average temperatures range from -14 degrees Fahrenheit in the winter to 50 degrees Fahrenheit in summer months. Precipitation averages 11 inches and snowfall averages 63 inches per year (ADCA, 2006).

### 3. Barrow

Barrow, which was incorporated in 1958, is located 10 miles south of Point Barrow on the Chukchi Sea coast. The area encompasses 18.4 square miles of land and 2.9 square miles of water. Formation of the North Slope Borough in 1972, the Arctic Slope Regional Corporation, and construction of the Prudhoe Bay oil fields and the Trans-Alaska Pipeline have contributed to Barrow's development (ADCA, 2006).

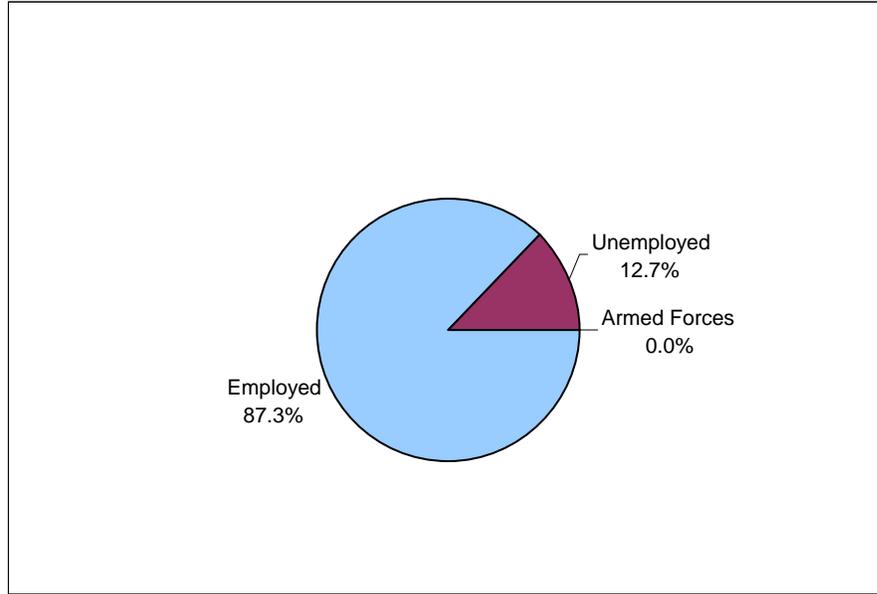
The population of Barrow is 4,351 (DCCED, 2005). The majority of the population is Inupiat, who practice a traditional subsistence lifestyle dependent on marine mammal hunting and supplemented by inland hunting and fishing (ADCA, 2006). The North Slope Borough is Barrow's primary employer; however employment is also provided by state and federal agencies and numerous other businesses that provide support services to oil and gas field operations. The median household income in 1999 was \$67,097 (USCB, 2000). The following figures display Barrow's employment classes and employment rates from the year 2000.

**Figure 4.3 2000 Barrow Employment Classes**



Source: (USCB, 2000)

**Figure 4.4 2000 Barrow Employment Rate**



Source: (USCB, 2000)

The North Slope Borough provides utilities to Barrow. Water is derived from a dam on Isatkoak Lagoon and is stored in a holding tank. The Barrow Utilities & Electric Cooperative operates the water and sewage treatment plants, generates and distributes electric power, and distributes piped natural gas for home heating. The local power plant is fueled by natural gas (ADCA, 2006).

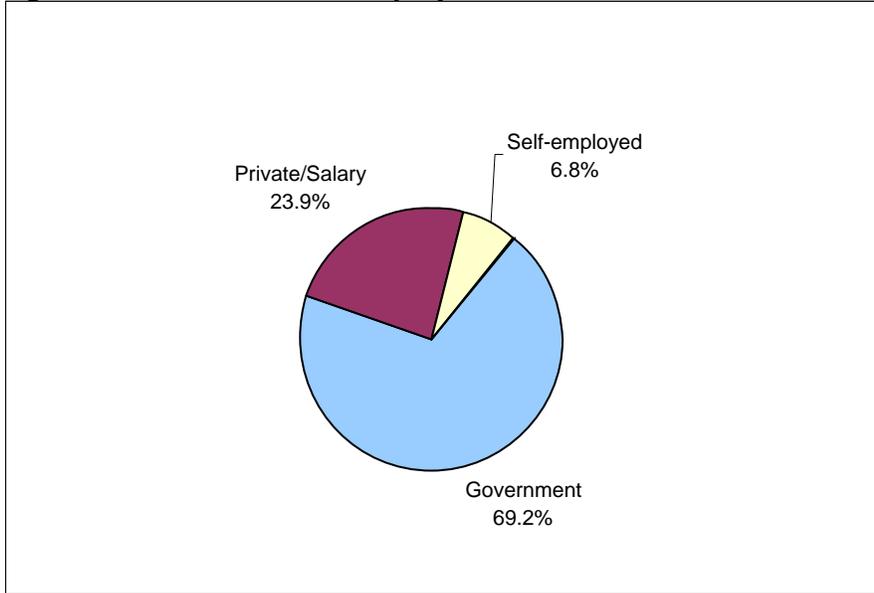
Year-round access is provided by air travel. The state owns the Wiley Post-Will Rogers Memorial Airport, which serves as the regional transportation center for the borough. The airport has a 6,500-foot-long asphalt runway. Marine and land transportation also provide seasonal access (ADCA, 2006).

#### 4. Kaktovik

Kaktovik, which was incorporated in 1971, is located on the north shore of Barter Island, between the Okpilak and Jago Rivers. The village encompasses 0.8 square miles of land and 0.2 square miles of water and lies within the Arctic National Wildlife Refuge. The island served as a major trade center for the Inupiat, particularly as a bartering place for Alaska Inupiat and Canadian Inuit (ADCA, 2006).

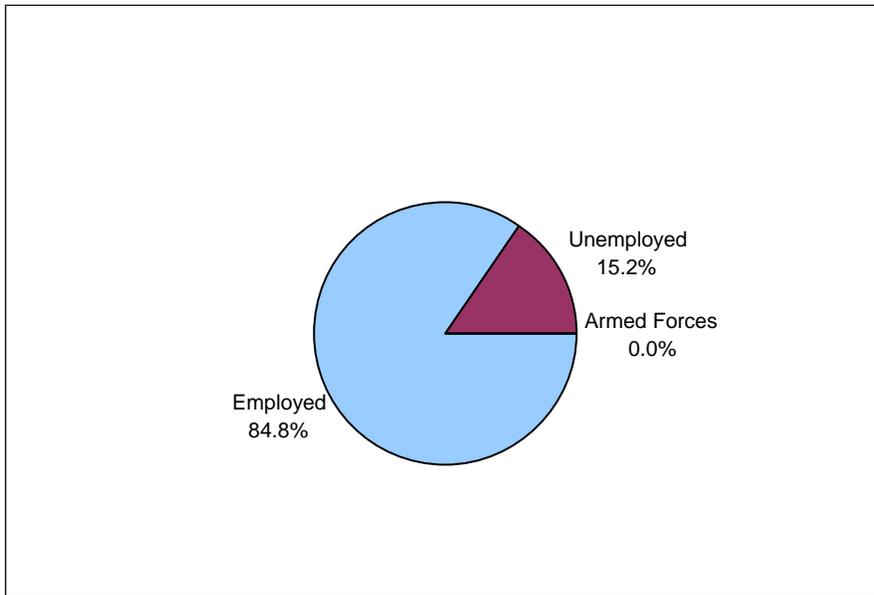
The population of Kaktovik is 276 (DCCED, 2005). The isolated village has maintained traditions and its subsistence is mainly dependent upon caribou (ADCA, 2006). Unemployment is high in Kaktovik and economic opportunities are limited due to the isolation of the community. The median household income in 1999 was \$55,625. The North Slope Borough and school provide most of the year-round employment; however, part-time seasonal jobs, such as construction, also provide income (USCB 2000). The following figures display Kaktovik's employment classes and employment rates from the year 2000.

**Figure 4.5 2000 Kaktovik Employment Classes**



Source: (USCB, 2000)

**Figure 4.6 2000 Kaktovik Employment Rate**



Source: (USCB, 2000)

The North Slope Borough provides utilities to Kaktovik. Water is derived from a surface source, treated and stored in a 680,000-gallon water tank, and delivered by truck to home holding tanks. Approximately 80 percent of homes have running water in the kitchen. Homes that are not connected to the water and sewer system utilize holding tanks that are pumped and hauled on a regular basis (ADCA, 2006).

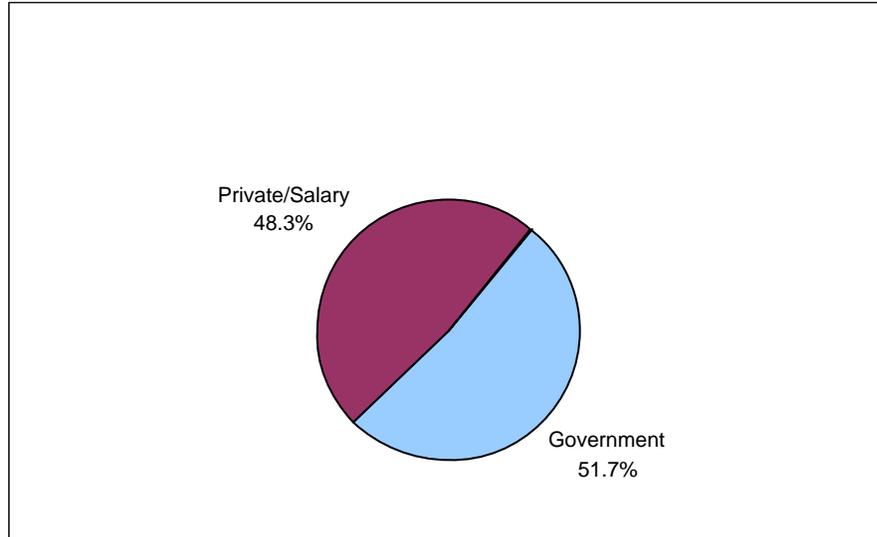
Year-round access is provided by air travel. The Barter Island Airport is owned by the U.S. Air Force and operated by the borough. Marine and land transportation also provide seasonal access (ADCA, 2006).

## 5. Nuiqsut

Nuiqsut, which encompasses 9.2 square miles of land, is located approximately 35 miles from the Beaufort Sea on the west bank of the Nechelik Channel of the Colville River delta. The Colville delta has traditionally been a gathering and trading place for the Inupiat and offers good hunting and fishing. The old village of Nuiqsut was abandoned in the late 1940s for lack of a school. In 1973, the village was resettled by 27 families from Barrow. In 1973 and 1974, a school, housing, and other facilities were constructed by federal agencies. The City of Nuiqsut was incorporated in 1975 (ADCA, 2006). The majority of the population is Inupiat, who practice a traditional subsistence lifestyle. A recent census reported the population of Nuiqsut to be 411 (DCCED 2005).

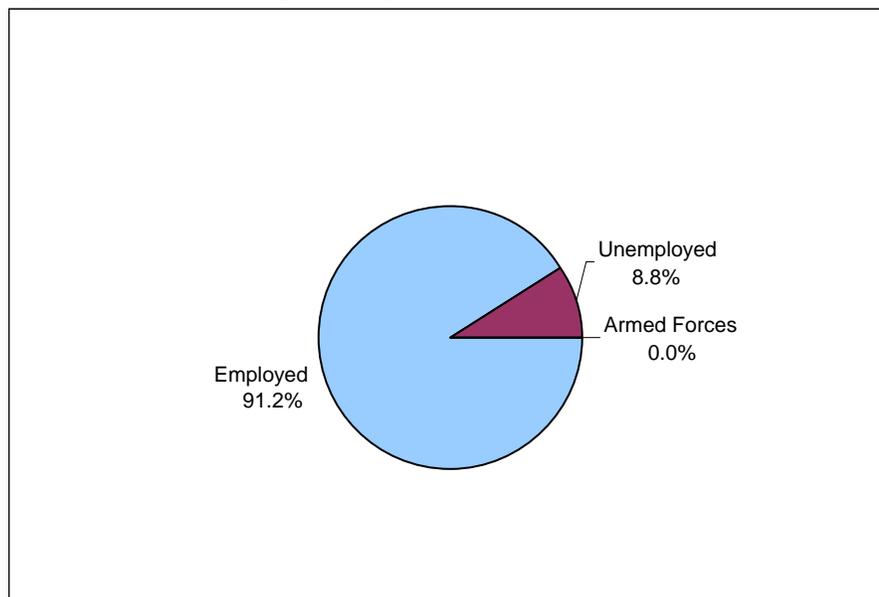
The median household income in 2000 was \$48,036 (USCB, 2000). The Kuukpik Native Corporation, school, borough, and store provide most of the year-round employment in the village. Trapping and craft-making also provide some income. Caribou, bowhead and beluga whale, seal, moose, and fish are staples of the diet. Polar bears are also hunted (ADCA, 2006). The following figures display Nuiqsut's employment classes and employment rates from the 2000 census.

**Figure 4.7 2000 Nuiqsut Employment Classes**



Source: (USCB, 2000)

**Figure 4.8 2000 Nuiqsut Employment Rate**



Source: (USCB, 2000)

The North Slope Borough provides utilities to Nuiqsut. Water is derived from a lake, treated and delivered to individual resident’s water tanks. Most homes have running water to the kitchen. The Alpine oil field will soon provide piped natural gas to Nuiqsut, which will lower the cost of running diesel electric generators for heating homes and other facilities (ADCA, 2006).

The borough owns and operates a gravel airstrip and year-round access is provided by air travel. Marine and land transportation also provide local seasonal access and snowmachines are used for local transportation in winter months (ADCA, 2006).

## 6. Prudhoe Bay/Deadhorse

Extensive development of the Prudhoe Bay/Deadhorse area for oil drilling operations began in the 1970s. Despite the low census figures—the population in 2000 was five—Prudhoe Bay is a very busy place and serves as a hub for oil and gas field workers (USCB, 2000). The airport, lodging, a general store, and other facilities are clustered in Deadhorse. The median household income in 1999 was \$90,957 (USCB, 2000).

The Prudhoe Bay oil fields provide approximately 20 percent of the nation’s domestic oil supply. More than 5,000 individuals are employed in drilling, pipeline operations, cargo transportation, and a variety of support positions (ADCA, 2006).

The airport at Deadhorse is the primary means of public transportation. The state owns a 6,500-foot-long asphalt airstrip and a heliport. Arco Alaska Inc. owns and maintains a 5,000-foot private gravel airstrip. The Dalton Highway is used year-round by trucks to haul cargo to the North Slope (ADCA, 2006).

## C. Subsistence

For a thorough compilation of subsistence baseline information for the proposed sale area, see Pedersen et al., (1985) and (1991); Hoffman et al., (1988); MMS (1995b) (1990) and (1987); Jacobson and Wentworth (1982); ADF&G, (1995); NSBCMP (1984a)(1984b) and (1988); and NSB (1997)(1979). For attention to social and cultural impacts, see (MMS, 1995b) socioeconomic indicators study, and (NSB, 1979).

## 1. The Meaning and Protection of Subsistence Values

In its most minimal definition, subsistence is sustenance. Subsistence uses include at least hunting, fishing, and gathering for the primary purpose of acquiring food (Bryner, 1995, citing to Case, 1984). Under Title 19 of the North Slope Borough Municipal Code (NSBMC), subsistence is defined as “an activity performed in support of the basic beliefs and nutritional needs of the residents of the borough and includes hunting, whaling, fishing, trapping, camping, food gathering, and other traditional and cultural activities” (NSBMC 19.20.020(67)). ANILCA defines subsistence usage as “the customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family consumption; and for customary trade” (16 U.S.C. § 3113; Bryner, 1995).

Subsistence in Alaska is more than harvesting, gathering, processing, sharing, and trading. It also includes cultural, social, and economic values associated with the taking, use, and exchange of plants, fish, and game. Subsistence embodies the essence of Inupiat culture. As described by the Alaska Federation of Natives, subsistence is “a way of life in rural Alaska that is vital to the preservation of communities, tribal cultures, and economies. Subsistence resources have great nutritional, economical, cultural, and spiritual importance in the lives of rural Alaskans” (BLM, 2005).

Inupiat culture is characterized by strong kinship ties, cooperative efforts, and sharing. Inupiat who maintain a close relationship to the land and perpetuate an understanding of the seasons and animals by educating youth are highly respected. Land and the natural environment are primary and sacred in the Inupiat world view. Names and songs identify the land and Inupiat see man’s place in the universe as a member of the world. The Inupiat view, being a part of the environment rather than apart from it, resulted in a subsistence life of complete dependence on the near environment, weather, and living resources (NSB, 1979).

Rural residents in Arctic Alaska annually harvest roughly 10,507,255 pounds of wild food, or 516 pounds per person, according to the Alaska Department of Fish and Game (BLM, 2005, citing ADF&G, 2000). Harvest levels vary broadly between communities and most subsistence resources are shared, traded, or given to others. Non-subsistence goods purchased with wages are also shared. Subsistence resources cannot be purchased with money; rather, they must be “earned” by hunting and gathering. On the other hand, subsistence technology, such as boats, all-terrain vehicles, fuel, and gear can be purchased with cash.

The collection, processing, and distribution of subsistence resources nearly always involve some group activity. Accordingly, to Alaska Natives subsistence “also encompasses a complex web of relationships that define and distinguish their traditional culture” (Bryner, 1995). The continued opportunity to engage in subsistence activities is a fundamental component of all Alaska Native cultures, and serves as the keystone to social, ethnic, and psychological identity.

Since the discovery of oil in Prudhoe Bay and the advent of oil and gas infrastructure development in the Arctic, village elders and traditional Inupiat have persistently expressed concerns that subsistence is threatened. The once open range of the Kuparuk and Sagavanirktok Rivers is now complicated by the presence of above-ground pipelines, spine roads, utility lines, and large facilities. Village leaders affirm that outside pressures and pressures within communities are challenging the system of values that has bonded them together (NSB, 1979).

Some Western institutions have been willfully adopted into village life, such as education, health care, and economic necessities like home-building materials and fuel (NSB, 1979). Others have not, such as some fish and game regulations. For example, catch-and-release fishing may be considered disrespectful in some Native cultures (Noland and Gallagher, 1989). Imposed seasons and bag limits restrict the taking of game, like

caribou, which were previously harvested year-round (Jacobson and Wentworth, 1982). Many traditional hunting, fishing, and gathering sites are on federally or state managed land. Private and public ownership of lands and waters can determine where, when, and sometimes how people may hunt.

The Nuiqsut Cultural Plan (NSB, 1979), published just after the construction of the trans-Alaska oil pipeline, identified forces converging upon the Inuit culture: competing interests, oil and gas development, environmental degradation, access and use limitations, land tenure problems, socio-economic instability, and loss of cultural privacy (NSB, 1979). All of these forces pose a threat to subsistence life and the traditional Inupiat culture.

To assure subsistence is protected, the locations of harvest areas and sites, and the harvest and participation levels (demand for resources), must be identified. Also, it is essential and legally mandated that healthy populations of fish and wildlife be conserved. When it is necessary to restrict the taking of fish and wildlife, subsistence uses are given priority over all other consumptive uses. Federal and state laws regulate subsistence use, access, and the trading of subsistence resources. On federal lands, the federal government is required by Title VIII of ANILCA (1980) to provide a subsistence priority for rural Alaska residents unless the state provides this priority through its laws. Subsistence use and allocation of fish and game is codified in state law under AS 16.05.258. Subsistence uses in Alaska are regulated by the U.S. Fish and Wildlife Service, Office of Subsistence Management, and the Alaska Department of Fish and Game, Division of Subsistence. For a discussion on the effects of the proposed lease sale on subsistence uses, see Chapter Five of this best interest finding.

## 2. Subsistence and the Mixed-cash Economy

The ADF&G conducts subsistence harvest surveys of communities throughout Alaska and compiles results in a computer database. Indicators tracked by ADF&G help to describe how the modern subsistence economy is functioning. Some indicators include species availability and abundance within traditional subsistence harvest zones, as well as levels of participation by community members in subsistence harvesting. These are discussed in some detail below. Another indicator characterizing the cash/non-cash economic mix is the amount and distribution of cash income among residents of the area or community. This varies among communities, depending on subsistence resource availability and the availability of jobs.

The costs and availability of goods and services in a community also affect the cash/non-cash mix. In a 2004 survey of 24 locations around Alaska, the Cooperative Extension Service of the University of Alaska Fairbanks listed Nuiqsut as the second most expensive place for food costs for a family with school-age children. Food items were more than 2.3 times more expensive in Nuiqsut than in Anchorage. Costs in the study did not factor in Native peoples' reliance on subsistence foods (Alaska Economic Trends, ADOL, 2005).

The relationship between earning cash wages and engaging in subsistence activities is different for each individual and depends on individual life choices and the flexibility of the available wage employment. Many residents choose to work seasonally, part-time, or just temporarily. Use preferences of individuals depend on cash availability (cash for supplies and transportation), job or village responsibilities, and resource preferences (NSB, 1979). Those who choose to hunt are likely to benefit from shared resources derived from wage earners and vice versa (NSB, 1979; Jacobson and Wentworth, 1982). Residents holding cash-paying positions conduct subsistence activities during non-work periods, weekends, and vacations (NSBCMP, 1984a).

Employment for wages, including full-time, part-time, temporary, and seasonal positions, has advantages and sacrifices for village residents. Wages provide residents with cash necessary to function in modern village communities, and provide families with money for housing and associated costs. The increase in job opportunities created by the North Slope Borough has resulted in more disposable income in the communities of the borough. However, time spent earning cash wages is generally time not spent engaging in

subsistence activities (Bryner, 1995). Employers are encouraged to provide residents with opportunities to participate in subsistence activities during key seasonal events, such as fall whaling, without losing their jobs.

A small percentage of full-time oil industry jobs on the North Slope is held by local residents. This is partly explained by the small labor supply of the North Slope Borough relative to the large labor demands of industry. While some full-time oil industry positions may be available in a community, the social costs of not participating in the traditional portion of the village economy may be greater than the cash benefits and income stability derived from participation in an oil field development labor force. The remoteness of villages with respect to oil field infrastructure coupled with long shift hours means that employees are more likely to be separated from their families and children.

### 3. Seasonal Cycle of Economic Activity and Subsistence Use Areas

Seasons on the Arctic coast are marked by the arrival and departure of sea ice, river ice, and changing winds. After the breakup of river ice and the retreat of fast ice along the shoreline, the tundra thaws and mobility is mostly restricted to open waterways and established trails. Seasons are also marked by the arrival and departure of migrating caribou, waterfowl, and bowhead whale. In the summer, the primary mode of transportation is by small skiff (14 to 18 feet), which can navigate the shallow channels of the river deltas and lagoons and by ATV for overland access. In winter, snowmachines and, to a lesser degree, dogsled teams provide transportation to hunting and fishing camps and trade fairs. Subsistence activities may require rural people to travel seasonally to hunting and fishing areas and camps as far as 70 miles offshore and inland to the Brooks Range (BLM, 2005). Historical subsistence access routes on the North Slope follow all major rivers and skirt the coast from the Canada border to Wainwright and beyond. The seasonal cycles of subsistence harvesting and subsistence use areas in the proposed sale area are depicted below in Figures 4.9, 4.11, and 4.12.

**Nuiqsut:** For residents of Nuiqsut, primary subsistence resources include bowhead whale, caribou, fish, waterfowl, and ptarmigan. Seals, muskox, Dall sheep, beluga whale, polar bear, moose, and walrus are also taken, but to a lesser extent (BLM 2005).

Fishing occurs both during the summer and in the fall when the ice first becomes thick enough for snowmachine travel. In June, after the ice goes out, broad whitefish move upriver. Two to four weeks after breakup, when muddy waters clear, fishing begins (Hoffman, et al., 1988). Residents travel from the village to fish camps along the river channels and fish and hunt for several days. Often several family members participate in the fishing activity, and family members employed in wage earning positions may travel to the fish camp on weekends (George and Nageak, 1986). Important traditional use sites along the lower Colville include Uyagagviit, and Nigliq (Nannie Wood's Camp), which according to Nuiqsut leader Leonard Lampe (1996) has hosted subsistence fishers and trappers since the late 1940s. Numerous other sites in use today are recorded in the North Slope Borough Traditional Land Use Inventory. Some important traditional use sites are depicted in Figure 4.10 (Hoffman, et al., 1988; NSB, 1979; ADF&G, 1986b; Jacobson and Wentworth, 1982).

Geese and king eiders fly low from west to east across the deltas and along the coast in June, and are hunted with shotguns (Hoffman, et al., 1988). Caribou of the Central Arctic herd approach the Colville delta in late May and early June, and calve in the area between the main channel of the Colville and Sagavanirktok River deltas. Also during June and into July, moose travel north along the upper Colville and Itkillik Rivers where they may be harvested later in the fall (Hoffman, et al., 1988).

Summer fishing with gill nets lasts throughout the open water season, from early June to mid-September with the broad whitefish being the preferred and most numerous species caught. Species harvested

include arctic char, whitefish, cisco, burbot and grayling. A few chum and pink salmon are also taken. Gill nets account for almost all the fish caught (ADF&G, 1995). Grayling may be caught with rod and reel or with nets in creeks. Hunting of ringed and bearded seal begins in July in the open water off the delta and continues throughout the summer months (Hoffman, et al., 1988).

**Figure 4.9 Annual Cycle of Subsistence Activities – Nuiqsut**

Species	Winter					Spring		Summer			Fall	
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Fish	High	Low	Low	Low	Low	Low	Low	High	High	High	Low	High
Birds/Eggs	Low	Low	Low	Low	Low	High	High	High	High	Low	Low	High
Berries	Low	Low	Low	Low	Low	Low	Low	Low	Low	High	High	Low
Moose	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Caribou	Low	High	Low	Low	Low	High	High	Low	Low	Low	Low	High
Furbearers	Low	Low	Low	Low	Low	High	Low	Low	Low	Low	Low	Low
Polar Bear	High	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Seals	Low	Low	Low	Low	Low	High	Low	High	High	High	High	Low
Bowheads	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	High	High

	No to Very Low Levels of Subsistence Activity
	Low to Medium Levels of Subsistence Activity
	High Levels of Subsistence Activity

Source: BLM, 2005, citing Research Foundation of the State University of New York, 1984 and SRBA, 2003



In the fall, the fish harvest consists mainly of least and arctic cisco, though other species of fish are also caught, and generally the harvest lasts only two to three weeks. The rate of fish harvest is significantly higher in the fall than in the summer season (George and Nageak, 1986) when arctic char and salmon begin their migration upriver. Small whitefish and arctic cisco are harvested near the ocean, but these species do not move far upriver. Spotted seals, valued for their skins, follow salmon and char upstream where they are hunted as far south as the confluence of the Itkillik and Colville Rivers.

In a study conducted between June 2005 and May 2006, 46 successful Nuiqsut hunting households reported harvesting 300 caribou, or an average of 8.3 caribou per successful household. The community caribou harvest for that year was estimated at 362 (Pedersen, 2007). Of the 362 caribou harvested in 2005-2006, ADF&G estimated 109 came from the Central Arctic herd; 217 from the Teshekpuk Lake herd; and 36 from the Western Arctic herd (Pedersen and McIntosh, 2007).

Late August is the optimum time to harvest caribou. At this time, caribou are fat from grazing all summer and fit for their long migration south. The hides are in good condition for making clothing and it is before rutting season, when the bulls are not good to eat (Hoffman, et al., 1988). In September, caribou begin moving down the Ublutuoch River and east across the Colville, before heading south toward the Brooks Range. After calving, caribou from the Central Arctic herd move toward the Sagavanirktok River and follow it south to the mountains.

As in Kaktovik, blueberries, cloudberry, cranberries, wild potato, and wild rhubarb are harvested (Jacobson and Wentworth, 1982). Arctic cisco and small whitefish run upriver just before freeze-up (Hoffman, et al., 1988). Residents hunt moose in an area between the village and the confluence of the Anaktuvuk and Colville Rivers.

For Nuiqsut, one of 10 Alaska whaling communities (BLM, 2005), whaling begins in the first week of September. Whaling teams travel by boat down the Colville River through Simpson Lagoon and set up camp at Cross or Nora Island; a trip that takes about eight hours, according to whaling captain Frank Long (1996). From there, teams in either skin boats or moderately-sized skiffs travel as quietly as possible into the Beaufort Sea, north, northeast, and east of Cross Island as far as 44 miles out (Long, 1996) into the fall migratory path of the bowhead whale. A well-known whaling captain and former mayor of the North Slope Borough describes the method: "During the fall hunt, boats move at very low speeds until a whale is spotted." (Ahmaogak, G., 1996b). Whaling boats are based out of Cross Island camp as long as two weeks or more. Often, seas are rough, and the farther offshore crews must travel to find whales, the greater the risk. Ringed and bearded seals, king eider, caribou, and polar bear may also be hunted during whaling expeditions (Hoffman, et al., 1988). After a whale is struck, it is towed to Cross Island, pulled onshore with a winch, and butchered. The whale is then transported by boat to Nuiqsut, or to West Dock, or Endicott and trucked to Olitok Point (Long, 1996). Historically, whole villages have participated in the processing and distribution of whales taken from the Beaufort Sea. The whale is shared during potlucks throughout the year, and at Thanksgiving, Christmas, and *Nalukataq* – the harvest feast where fish, caribou, whale meat, and muktuk is portioned out to every member of the community (NSB, 1997; MMS, 1996a; Jacobson and Wentworth, 1982).

In 1996, Nuiqsut harvested two whales (about four miles north of Narwhal Island), and transferred the remainder of its quota to Barrow, because two was enough to feed the community (AEWC, 1997). This general description of traditional whaling is included here because of its importance to Inupiat culture; however, whaling should not be affected by activities in the proposed sale area because all sales and leasing activities will be entirely onshore.

By mid-October, after the rivers freeze, residents travel by snowmachine to fish camps on the Colville River or Fish Creek to fish for arctic cisco and small whitefish (Hoffman, et al., 1988). Ice fishing is

accomplished by cutting holes in the ice and stretching gill nets under the ice (George and Nageak, 1986). Hook and line is used to ice-fish for burbot and grayling. Some moose and caribou hunting may occur during October and November (Hoffman, et al., 1988). Few polar bears are harvested by Nuiqsut hunters, though when hunting does occur, it's usually after the fall whaling season (BLM 2005) from October to May (NSB, 1979).

Furbearers, including arctic fox, red fox, wolf, and wolverine are trapped or shot throughout the winter, though most hunters and trappers avoid going out during the dark, often harsh days of midwinter (BLM 2005). Some caribou and moose may be harvested, and seals taken in the remaining open leads of sea ice. From January to March, trapping continues, and some hunting of caribou and moose may occur, depending on the depth of the snow and ability to move about (Hoffman, et al., 1988).

Mid-April brings an end to trapping season. Hook-and-line fishing for burbot and lake trout resumes. Wolf and wolverine are hunted with rifles by hunters on snowmachines, and seals sunning themselves on the sea ice are also harvested year round. These conditions persist through May until the river ice again washes out to sea, completing the annual cycle of subsistence harvest (Hoffman, et al., 1988).

**Anaktuvuk Pass** is located 60 miles west of the Dalton Highway in a low pass slightly south of the Brooks Range continental divide (BLM, 2005). Residents mainly use the corridors of the Colville, Itkillik, and Anaktuvuk Rivers for subsistence activities within the proposed sale area (Pedersen, 1997). Unlike other North Slope Borough communities, Anaktuvuk Pass residents have no direct access to marine mammal resources (BLM, 2005). The annual subsistence cycle of Anaktuvuk Pass revolves around caribou, though Dall sheep and moose are also important subsistence resources (BLM, 2005). In a survey conducted by the North Slope Borough Department of Wildlife Management, caribou accounted for 82.5 percent of the harvest in edible pounds for a 1-year period. The reported number of caribou harvested during the study period (July 1, 1994, to June 30, 1995) was 311. This is low when compared with previous years for which harvest data are available. For example, in 1990-91, the estimated harvest was 592 and in 1993-94 it was 574 (NSB, 1996).

Intensive caribou hunting occurs in April and May as animals move through the Brooks Range on spring migrations northward. Caribou hunting intensifies again in the fall as the animals begin to move southward. Caribou are also hunted in winter. One Anaktuvuk Pass hunter was quoted to say:

I hunt mostly in the winter time; it is easier. That is when the caribou are pretty fat. I hunt mostly in winter when there is snow on the ground; you can go further. The summer time you cannot go too much unless you have a good Argo. My dad has one (BLM, 2005).

Fish and birds are generally of lesser subsistence value to Anaktuvuk Pass residents but become crucial during times when other resources are scarce. Anaktuvuk Pass residents harvest fewer ducks and geese than hunters in other North Slope villages because waterfowl in the central Brooks Range are generally scarce. The types of birds harvested include long-tailed ducks, pintails, and white-fronted geese. Ptarmigan are considered the most important species and are harvested year round (NSB, 1996). Important fish species include grayling, arctic char, lake trout, and whitefish.

**Figure 4.11 Annual Cycle of Subsistence Activities – Anaktuvuk Pass**

Species	Winter					Spring		Summer			Fall	
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Caribou												
Sheep												
Moose												
Ptarmigan												
Furbearers												
Fish												
Berries												
	No to Very Low Levels of Subsistence Activity											
	Low to Medium Levels of Subsistence Activity											
	High Levels of Subsistence Activity											

Source: BLM, 2005, citing Brower and Opie, 1996 and SRBA, 2003

**Kaktovik** subsistence harvest areas range from east of the Canada border to Camden and Mikkelson Bays. Traditional Land Use Inventory sites are discussed in Jacobson and Wentworth (1982). Important locations in the Kaktovik Traditional Land Use Inventory (TLUI) in or adjacent to the sale area include Flaxman Island, Brownlow Point, and Tigutaaq at the confluence of the Tamayariak and Canning Rivers. The primary early winter camps of Kaktovik people are located along the Hulahula and Sadlerochit Rivers (Jacobson and Wentworth, 1982).

The annual cycle of subsistence activity for Kaktovik is similar to that of Nuiqsut; the same species are harvested at the same time, but from different lakes, rivers, uplands, islands, estuaries, and marine waters. Residents travel to the mountains to hunt wolf, sheep, wolverine, and moose in March. April and May are important months for the taking of ground squirrel, ptarmigan, and marmot. In late May and early June, residents camp in the Camden Bay area to hunt migrating waterfowl, such as eider and brant. By June, mobility is increasingly restricted due to spring thaw. Birds, seals, and caribou are hunted closer to Barter Island. After calving in late May and early June, caribou of the Porcupine herd graze about the area between the Canning River and the Mackenzie River delta. By late June, land travel is restricted and the sea ice still remains. In July, the sea ice goes out, and hunting of caribou and fishing of arctic char with nets is accomplished by boat. In the fall, caribou begin moving toward winter habitat on the south side of the Brooks Range. August is good for fishing char and arctic cisco (Jacobson and Wentworth, 1982).

**Barrow** is located approximately 130 miles northwest of the proposed lease sale area; however, the community’s subsistence activities occur within a large geographical region that includes the proposed sale area’s western portion. The city is set on a point of land bordered by the Chukchi and Beaufort Seas, and subsistence hunting centers largely around marine mammal hunting, especially whaling (BLM, 2005). Other important subsistence resources include caribou, waterfowl, and fish.

Many Barrow residents with ancestral ties to Nuiqsut utilize the proposed sale area as they continue to return to traditional subsistence use areas (BLM, 2005). Although most terrestrial hunting is done west of the proposed sale area, caribou, wolf, and wolverine are sometimes hunted in the Colville River delta region.

**Figure 4.12 Annual Cycle of Subsistence Activities – Barrow**

Species	Winter					Spring		Summer			Fall	
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Fish												
Birds												
Berries												
Furbearers												
Caribou												
Polar Bear												
Seals												
Walrus												
Bowhead												
	No to Very Low Levels of Subsistence Activity											
	Low to Medium Levels of Subsistence Activity											
	High Levels of Subsistence Activity											

Source: BLM, 2005, citing SRBA and ISER, 1993 and SRBA, 2003

#### 4. Harvest Levels of Plants, Fish, and Game; Species Variety; and Participation Levels

Factors affecting subsistence harvests include the availability of fish and wildlife populations; weather; terrain; methods of harvest; availability of transportation; state and federal hunting and fishing regulations; local economic conditions; availability of cash for supplies and transportation; the changing condition of the meat, hide or fur; and community needs (Jacobson and Wentworth 1982; Pedersen, et al.,1985). Soggy tundra and shallow rivers restrict most summertime activities to coastal areas, but frozen ground, snow cover, ATVs, and snowmachines expand harvest areas during the winter.

Subsistence resources are shared between wage-earning and non-wage earning members of the community, as well as with relatives and others living in North Slope communities, Fairbanks, and Anchorage (NSBCMP, 1984a). Fish, caribou, and bowhead whales comprise the bulk of the nutritional needs of the Inupiat, but other animals are also important for both nutritional and cultural uses (ADF&G, 1995).

Nuiqsut residents harvested an average of 741.8 pounds per person of usable subsistence resources for home use and noncommercial exchange between households in 1993 (see Table 4.1). Fish comprised nearly a third of the subsistence wild resource harvested by Nuiqsut residents, land mammals another third and marine mammals the final third. Birds and eggs accounted for about 2 percent of the community harvest (ADF&G, 1996a).

Species harvested in the proposed sale area include salmon, cod, rainbow smelt, burbot, arctic char, arctic cisco, least cisco, lake trout, grayling, sheefish, whitefish, brown bear, polar bear, caribou, moose, muskox, arctic fox, red fox, ground squirrel, wolf, wolverine, weasel, marmot, mink, ducks, geese, brant, ptarmigan, sandhill crane, tundra swan, salmonberries, blueberries, crowberries (regionally called blackberries (ARCUS, 2002)), cranberries, greens, and mushrooms (ADF&G, 1995; NSB, 1997). On average, Nuiqsut households used more than 20 different kinds of wild resources, about 12 types of resources were shared, and 11 varieties given away (ADF&G, 1996a). Edible pounds harvested from selected resources are listed below.

**Table 4.1 Nuiqsut Subsistence Harvests**

<b>Nuiqsut Per Capita Edible Pounds Subsistence Resources Harvested, 1993</b>	
Resource	Per Capita Harvest (pounds)
Fish	250.6
Caribou	227.6
Bowhead Whale	213
Ringed Seal	20
Moose	12.2
Bearded Seal	3
White-fronted Geese	3
Ducks (Eider)	2.9
Canada Geese	2.3
Brown Bear	2
Vegetation and Berries	1.1
Brant	1
Total (including other resources harvested in 1993)	741.8

In the 1985 survey year, subsistence harvests averaged about 400 pounds per person, most of which consisted of caribou and whitefish. At that time, the bowhead harvest was limited, but in the following years, marine mammal harvests gained an increasing proportion of the total subsistence harvest for the community. With the per capita harvest nearly doubling between 1985 and 1993, the importance of Nuiqsut's subsistence harvest is underscored. "This is significant to keep in mind as Nuiqsut's immediate subsistence resource area is presently undergoing intensive oil and gas exploration, and increasing industrial development associated with oil extraction is taking place within Nuiqsut's general subsistence resource area." (ADF&G, 1996a)

Caribou are a staple food that is eaten fresh, frozen, and dried. When available, caribou provide a source of fresh meat throughout the year. The skins of caribou are used to make blankets, sleeping pads, parkas, boot soles, mitts, and masks. In survey years 2002-2003 to 2005-2006, ADF&G estimated Nuiqsut households harvested between 292 and 436 caribou annually, or an average of 379.75 caribou per year (Pedersen and McIntosh, 2007).

Hunting for moose and brown bear also occurs along the Colville River. Nine moose were harvested by village residents in 1993; however, the moose population near Nuiqsut declined rapidly in that decade. About 600 small land mammals were harvested by Nuiqsut residents in the survey year, including more than 300 ground squirrels, 200 foxes, 31 wolves, about 20 wolverines, and 10 weasels (ADF&G, 1995).

More than half of the 12-pound per capita harvest of birds in 1993 consisted of geese; the remainder consisted of ducks and ptarmigan. Nuiqsut village harvested about two eider ducks, one brant, two Canada geese, two white-fronted geese, and three ptarmigan per person in 1993. Sixteen snow geese, seven tundra swans, 78 long-tailed ducks and 25 pintail ducks were harvested by village residents in that year. Additionally, more than 100 pounds of eider and goose eggs were harvested by Nuiqsut residents in 1993 (ADF&G, 1995).

In 1993, bowhead whale made up 90 percent of the 236-pound per capita marine mammal harvest. Ringed seals made up the remaining 20 pounds or about one seal for every four people. About six bearded seals were harvested in Nuiqsut. Polar bears are also hunted in the proposed sale area. Occasionally, walrus are taken if the opportunity arises (ADF&G, 1995).

Broad whitefish are considered one of the most important subsistence fish in the region for the villages of Nuiqsut, Barrow, and Atqasuk. They are traded with other villages as well (NSB 2007, citing Braund et al., 1993). In 1993, 46 percent of the 250-pound per capita fish harvest consisted of broad whitefish, 39 percent

were either arctic cisco or least cisco, 7 percent were burbot, 5 percent were grayling, and the remainder included arctic char and salmon (ADF&G, 1995).

All Nuiqsut households used subsistence resources in 1993. Ninety-four percent attempted to harvest subsistence resources, with 90 percent being successful. Ninety-eight percent of all households in the community received wild resources, and 92 percent gave away wild resources (ADF&G, 1995).

In addition to being personally consumed, a large, but unknown portion of the fish caught are either shared with other communities in the area, or sold (George and Nageak, 1986). Most Nuiqsut families participate in subsistence fishing activities. The bulk of the fishing in the 1980s was probably done by about half the families in the area (George and Nageak, 1986).

Subsistence resources are utilized for much more than nutrition. Many non-edible parts of the animals harvested are used to make functional items and arts and crafts. Driftwood and willow brush are collected for firewood and building materials. Marine mammal bones and hides have also been used to construct temporary shelters and traditional boats. Caribou hides are used for bedding, clothing, and masks. Seal skins are used for carrying water and for covering traditional boats. Whale baleen is decorated and etched into storytelling artworks and baskets. Ivory, caribou antler and bone, and whale bones are carved into miniature animals, umiaks, and hunting scenes or made into functional items, like needle cases or knife and ulu handles. Jewelry is made out of many things, including ivory, antler, feathers, and imported beads. Bearded seal whiskers are used in making earrings. Wolverine, wolf, polar bear, seal, and fox fur are used to make parkas, slippers, mukluks, and hats, and are used in making dolls, Eskimo yo-yos, and caribou-skin masks. Feathers and skins are used to make drums and many other craft items, such as spirit masks.

Approximately one in 10 residents of the borough produces arts and crafts. These items may be traded, shared, given away, or sold. Prices of such items vary widely from \$10 or \$20 to thousands. These items are made for two basic reasons: recreation and artistic expression, or to raise cash for a specific purpose, such as an airline ticket. The items are likely not produced solely for the purpose of generating income in order to perpetuate the craft (Steihn and Hayes, 1996).

## D. Commercial and Sport Fishing

In the entire North Slope Borough, nine residents held commercial fishing permits in 2005 (CFEC, 2007). A commercial fall whitefish fishery is located outside of the sale area on the east channel of the Colville River. This gillnet fishery is the only commercial fishery within the proposed sale area. In 1995, nearly 6,000 pounds of humpback or broad whitefish were harvested, a catch valued at \$4,480 to fishers. In the same year, 9,121 pounds of arctic cisco worth \$12,541 to fishers were landed (Busher and Borba, 1996).

ADF&G tabulates non-subsistence sport fishing catch and harvest estimates for the entire North Slope drainage area. Fishing effort, catch, and harvest for the Sagavanirktok River are also tracked. Most fish caught by sport anglers are not harvested, but released back to the water. For example, ADF&G estimates that 1,716 arctic char were caught on the Sagavanirktok River by sport fishers in 1994, but only 147 were harvested. Similarly, an estimated 2,644 grayling were caught on the river, but only 147 were harvested (ADF&G, 1996b).

## E. Sport Hunting, Guiding, and Outfitting

Sport hunting of big and small game in the onshore portion of the sale area is managed by ADF&G, Division of Wildlife Conservation. The state is divided into 26 game management units (GMUs). All Arctic Ocean drainages between Cape Lisburne and the Alaska-Canada border are contained in GMUs 26A, 26B, and 26C. Unit 26A lies west of the Itkillik River drainage, and west of the east bank of the Colville River between

the mouth of the Itkillik River and the Arctic Ocean. A significant portion on Unit 26A overlaps with the NPR-A. Unit 26B extends from the eastern boundary of 26A to the west bank of the Canning River, and the west bank of the Marsh Fork of the Canning River. All of Unit 26C is within the Arctic National Wildlife Refuge. It is unknown exactly how many animals of each species are harvested within the proposed sale area in any given year.

Sport hunting statistics collected by ADF&G are not specific to the proposed sale area, but estimate the harvest of whole GMUs. Statistics on hunter residency, success rate, mode of transportation, and whether commercial services were used are also collected. Transportation data reflects the mode each hunter used to get to the point where they started walking (ADF&G, 1996b).

Hunting seasons and guidelines are determined by the Alaska Board of Game, and administered by ADF&G. The Prudhoe Unit is closed to big game hunting (5 AAC 92.510), however, residents may sport hunt in other oil fields. The Dalton Highway corridor (extending five miles from each side of the highway) is closed to hunting for big and small game, except with bow and arrow, and use of motorized vehicles is restricted in the corridor. Firearms possession by industry employees is restricted and workers are not likely to sport hunt in the area during their active-duty shifts. Moose hunting is closed to nonresidents on the North Slope (ADF&G, 1996c).

## 1. Brown bear

Total annual hunter harvest during 1989 through 2001 ranged from 21-35. Most brown bear were taken in Units 25A, 26B and 26C. The overall harvest was nearly stable in recent years except in Unit 26B where the number of brown bears taken increased during 1996 and 1997 (Stephenson, 2003). In 2005, 32 brown bear were taken in Unit 26 (ADF&G, 2005)

## 2. Caribou

According to a June 2005-May 2006 survey, Nuiqsut hunters ranged north to the mouth of the Nechelik Channel (of the Colville River), south as far as the confluence of the Chandler and Colville Rivers, west as far as the upper Judy Creek, and south-east as far as the White Hills on the upper Kuparuk River. In Nuiqsut, 46 successful hunting households reported harvesting 300 caribou (an average of 8.3 caribou per successful household); the annual community harvest is estimated to be 362 caribou (ADF&G, 2007). For the entire Central Arctic Herd, there were 625 caribou harvested in 2004-2005 (ADF&G, 2005).

## 3. Moose

Access plays a dominate role in the chronology of the moose harvest. Most moose are killed during the first 10 weeks of the regular hunting season, when lack of snow makes it feasible to highway vehicles or boats (ADF&G, 1986b). In the 2004-2005 year, 8 moose were harvested from GMU 26. This harvest total does not include unreported harvest which may be substantial (ADF&G, 2005).

## 4. Wolf

In spite of a generally high birth rate, wolves rarely become abundant because mortality is high. In much of Alaska, hunting and trapping are the major sources of mortality, although diseases, malnutrition, accidents, and particularly intraspecific strife act to regulate wolf numbers. There were 10 wolves taken from Unit 26 in 2004-2005 (ADF&G, 2005).

## 5. Other Animals

Muskoxen populations in Alaska declined substantially in Unit 26B beginning in 1999. In 1998, ADF&G determined that a harvest of no more than 20 muskoxen was necessary to provide a reasonable opportunity for subsistence use. In all of Unit 26B, reported harvest of muskoxen was 9, 3, and 8, respectively in regulatory years 2002, 2003, and 2004 (Lenart, 2005). In 2004-2005 there were 8 muskoxen taken in Unit 26. Restrictions in regulations ensure a low harvest. Some hunters may not have reported their harvests, despite the permit systems.

The level of sport hunting of waterfowl on the North Slope is currently very low. This is likely due to the number of hunters seeking them, rather than other factors, such as low population levels, climatic conditions affecting migration, or regulatory constraints. The estimated number of hunter-days afield (number of active waterfowl hunters multiplied by the number of days spent in the field) was 17 for the 1994-95 year; down from 157 hunter-days in the previous year. ADF&G reports that “there are fewer Alaskans hunting waterfowl than any time since the surge in the state’s population during the 1970s.” (ADF&G, 1996b).

## F. Tourism and Recreation

Cultural heritage tourism development, wilderness adventure travel, and ecotourism hold the greatest potential for future tourism growth within the North Slope region. Cultural and historical tourism opportunities in the North Slope Borough offer visitors unique experiences found nowhere else in Alaska. For example, visiting a historical site such as the Cape Smythe Whaling and Trading Station in Browerville near Barrow, which was built as a whaling station in 1893 and is the oldest frame building in the Arctic. For the more adventurous visitors, river rafting, dog mushing, backpacking, and fishing opportunities are available. The remote, natural environment of the North Slope appeals to the ecotourist who seeks an educational experience without the crowds (ADCED, 2006).

Barrow is known as America’s “northernmost city” and serves as the primary transportation hub for the North Slope Borough. Barrow and other places, such as the oil fields at Prudhoe Bay, the supply center at Deadhorse, and the Simon Paneak Memorial Museum at Anaktuvuk Pass, are popular packaged tour destinations. The trans-Alaska oil pipeline is one of Alaska’s biggest attractions. It follows the Dalton Highway, a 414-mile gravel road that parallels the northernmost portion of the pipeline. Amenities are limited and public access is not allowed through the oil fields. A visitor to the North Slope Borough can expect to observe rich and varied cultural opportunities, including whaling, traditional dancing, storytelling, mask making, beadwork, and basket making.

Substantial opportunities exist for the adventure traveler for sport fishing, hunting, and other forms of outdoor recreation. Scenic rivers in the Arctic National Wildlife Refuge offer both river rafting and fishing experiences. The uplands provide hunting opportunities for caribou, bear, and sheep. Adventure travelers enjoy guided backpack tours and are showing an increasing interest in winter recreation activities, such as snowmachining, dog mushing, and northern lights viewing.

Ecotourism, which focuses on educational aspects, is one of the fastest growing segments of the visitor industry (ADCED, 2006). Visitors who enjoy bird watching and wildlife viewing hold great potential for the North Slope Borough. The Barrow Birding Center provides a checklist of 185 species. Several new hotels offer accommodations specifically for visiting birdwatchers. Wildlife viewing opportunities also exist for moose, wolves, caribou, brown and polar bears, muskoxen, wolverine, arctic fox, and lynx.

Potential tourism markets have been identified as cultural, adventure, and ecotourism on the North Slope. However, economic issues exist for tourism development, including a limited basic infrastructure and services and distance from major tourism corridors. The aim of North Slope tourism planners is to develop a

coordinated response to these issues and develop a tourism marketing program that ensures a quality experience for visitors. Questions and concerns remain about the compatibility of tourism with the village lifestyle (ADCED, 2006).

Some local residents feel that their homes and cultures are on display and believe the tourism industry may have a negative affect on the community. Comprehensive tourism planning takes into consideration the importance of the subsistence way of life. Responsible tour operators in the area ask permission before entering private property and educate their clients about subsistence values and incorporate these principles into their marketing programs. These and other important concerns are being addressed with tourism management planning efforts (ADCED, 2006).

Protecting traditional subsistence gathering areas also remains a top priority. Sometimes conflicts occur when visitors trespass on private land to camp, fish, and hunt or view wildlife. Subsistence users may be hunting the same birds that birdwatchers have come to view. Sport fishing and commercial hunting activities may compete with resident subsistence users of fish and wildlife resources (ADCED, 2006).

## G. Oil and Gas Extraction

In 1968, Atlantic Richfield announced the discovery of commercial oil deposits at Prudhoe Bay. Exploration and development grew dramatically and production began in 1977 with the construction of the trans-Alaska oil pipeline between Prudhoe Bay and port of Valdez. The North Slope produced nearly 13 billion barrels of oil and natural gas liquids by 1999, 80 percent of it from Prudhoe Bay and 13 percent of it from Kuparuk. Production of oil, condensate, and natural gas liquids from the North Slope fields peaked at 2.2 million barrels per day in 1988 and declined to 1.1 million barrels per day by 1999. By the year 2021, the production is forecast to fall to about 408,000 barrels per day (ADCED, 2006).

Exploration and development activity has boomed on the North Slope over the last 50 years. In 1969, the state held a lease sale and offered over 450,000 acres along the Arctic coast between the Canning and Colville Rivers. They earned \$900 million in bonus bids on 164 tracts. Since 1969, the state continues to conduct lease sales on the North Slope and Beaufort Sea. Many factors contribute to the continuous production from North Slope oil fields including the state leasing program, additional fields coming online, improved technology in oil recovery, improved drilling technology and higher oil prices (ADCED, 2006).

Other areas in northern Alaska also have potential for oil and gas production. Significant national debate has occurred regarding possible oil development within the Arctic National Wildlife Refuge. Additionally, the Northstar oil field is a joint state and federal unit located offshore in the Beaufort Sea and the first field to produce outer continental shelf oil. Northstar contains an estimated 176 million barrels of recoverable oil, with a field life of some 15 years. Most of these post-Prudhoe discoveries are currently producing oil and are taking advantage of the Prudhoe Bay infrastructure and proximity to the Trans-Alaska Pipeline. Five of these major fields include the Lisburne, Kuparuk, Milne Point, Endicott, and Point McIntyre. Fields more recently brought into production include the Badami Tarn, Alpine, and West Sak (ADCED, 2006).

North Slope oil fields also contain significant amounts of natural gas. Natural gas production on the North Slope was 3.2 trillion cubic feet in 1999, 93 percent of which was injected into wells for enhanced oil recovery. This gas can be retrieved again in the future once a gas transportation system is put into place. The remaining gas is used as fuel for oil field equipment and pipeline operations (ADCED, 2006). Construction of a natural gas pipeline from the North Slope to North American markets is under active consideration. Recent increases in natural gas prices have improved the economics of constructing a gas pipeline.

**Arctic National Wildlife Refuge (ANWR):** ANWR was created in 1980 with the passage of the Alaska National Interest Lands Conservation Act. Section 1002 of that act deferred a decision regarding future

management of the 1.5 million-acre coastal plain in recognition of the area's potential oil and gas resources and its importance as wildlife habitat. Substantial national controversy surrounds opening the Alaska National Wildlife Refuge to oil and gas development.

**Eastern North Slope Pipelines:** The ADNR, OPMP submitted applications for the Eastern North Slope Oil and Gas Pipeline Conditional Rights-Of-Way on September 19, 2005. The Joint Pipeline Office (JPO) accepted the applications as complete on February 26, 2006. The proposed pipeline corridor is 45 miles long, beginning at Point Thomson and ending near Pump Station 1, and 700 feet wide to allow for construction, operation, and maintenance. In February 2006, the JPO public noticed the applications.

**Bullen Point Road:** The State of Alaska is exploring plans for the Bullen Point Road, which will connect the road system at Prudhoe Bay with oil and gas prospects near Point Thomson and the eastern end of the North Slope. Road construction is projected to start in the year 2008.

**Gas Pipeline:** Almost 26 trillion cubic feet of gas reserves are exportable from areas near the Prudhoe Bay oil fields. High natural gas prices have increased the prospect of an Alaska natural gas pipeline in recent years. In addition to commercializing gas from state lands, new gas infrastructure from the North Slope to market would improve the economic viability of gas prospects on federal lands

