

Chapter Five: Current and Projected Uses in the North Slope Foothills Area

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Chapter Five: Current and Projected Uses in the North Slope Foothills Area

AS 38.05.035(g) directs that best interest findings consider and discuss the current and projected uses in the area, including uses and value of fish and wildlife. The North Slope Foothills lease sale area provides important habitat for terrestrial mammals, many species of birds, and freshwater fishes. The wildlife, birds, fish and vegetation of the area provide the resource base for subsistence fishing and hunting, and for some sport fishing and sport hunting. There are no commercial fisheries reported in the lease sale area, although one previously existed downriver to the north along the Colville River (Hayes et al. 2008). The lease sale area is used to a small extent for recreation, tourism and Arctic research. The primary industrial use of the area is for oil and gas development. Some mining exploration has also been proposed.

A. Management

Management authorities for fish and wildlife fall under the state ADF&G on state land. The proximity to federal and private owned land causes overlap of management and harvest activities throughout the North Slope region. Migratory birds are federally managed by the U.S. Fish and Wildlife Service. The North Slope Borough provides significant input regarding management of wildlife and habitat (Brower et al. 2000). Local residents serve on a number of advisory committees that provide input to state or federal management agencies, and local residents are also members of commissions that participate in co-management of migratory birds (Brower et al. 2000).

The reasonably foreseeable cumulative effects of the lease sale on subsistence activities are discussed in Chapter Eight. Mitigation Measures and Lessee Advisories designed to minimize impacts to subsistence resources are listed in Chapter Nine.

B. Uses and Value of Wildlife, Fish and Plants

1. Subsistence Hunting

The State defines subsistence uses as the noncommercial, customary and traditional uses of wild, renewable resources (AS 16.05.940[30]). Subsistence also refers to the production and distribution of wild resources for local use and small-scale exchanges in Alaska (Braund and Moorehead 2009, citing to Wolfe). The North Slope Foothills lease sale area encompasses lands traditionally and presently used for economic, cultural, and social purposes by residents of Anaktuvuk Pass, Nuiqsut, Barrow and Kaktovik (Pedersen 2009).

Community well-being depends on the continued use of subsistence resources because of their cultural and economical significance. The subsistence way of life, with its associated values of sharing food and its influence on the extended family and traditional knowledge, is considered an integral part of being Inupiat (Kruse et al. 1983). In addition to this cultural component, subsistence is the direct source of economic well being for NSB residents. Subsistence resources enter into household income as a food source that does not have to be purchased.

Subsistence activities in the lease sale area vary from season to season depending on the availability of food and the ability to travel (Brown 1979). In summer, the primary mode of transportation is by small skiff, which can navigate the shallow river channels, and by ATV for overland access. In winter, snow machines provide transportation to hunting and fishing camps. Historical subsistence access routes on the North Slope follow all major rivers and tributaries, and skirt the coast from the Canadian border to Wainwright and beyond.

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 meat, hide or fur and community needs (Jacobson and Wentworth 1982; ISER and Scott Goldsmith 1991). Local subsistence users know the best time to harvest certain animals, fish, birds and vegetation. The seasons when the animals and fish are harvested depend upon many factors, but similar habitats serve as hunting and fishing areas for all of these communities.

The primary goal of Inupiat social structure is to extend and ensure cooperation to reduce individual risk. Important social relationships include hunting partnerships, food sharing, community education and social status (Spencer 1969). Subsistence food is the link that holds people together as members of a common social and economic community. Sharing is important in Inupiat society. A sense of community was essential in the past, when sharing was the best insurance against starvation. During times of shortage, food sharing maximized everyone's chances of survival (Brower and Opie 1996). The Inupiat make use of virtually all local plant and animal resources for food and raw materials.

Subsistence resources are utilized for much more than nutrition. Many non-edible parts of the animals harvested are used to make both functional items, and arts and crafts. Driftwood and willow brush are collected for firewood and building materials. Caribou hides are used for bedding, clothing, and masks. Ivory, caribou antler and bone, and whale bones are carved into miniature animals, umiaks, and hunting scenes or made into functional items, like knife or ulu handles and needle cases. Clothing is also made from sheep, moose, bear, wolf, wolverine, lynx, fox, Arctic hare, marmot and ground squirrels (Brown 1979). Jewelry is made out of many things, including ivory, antler, feathers and imported beads. 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-yo's, and caribou skin masks. Feathers and skins are used to make drums and many other craft items, such as spirit masks.

2. Communities Active in Subsistence Harvesting

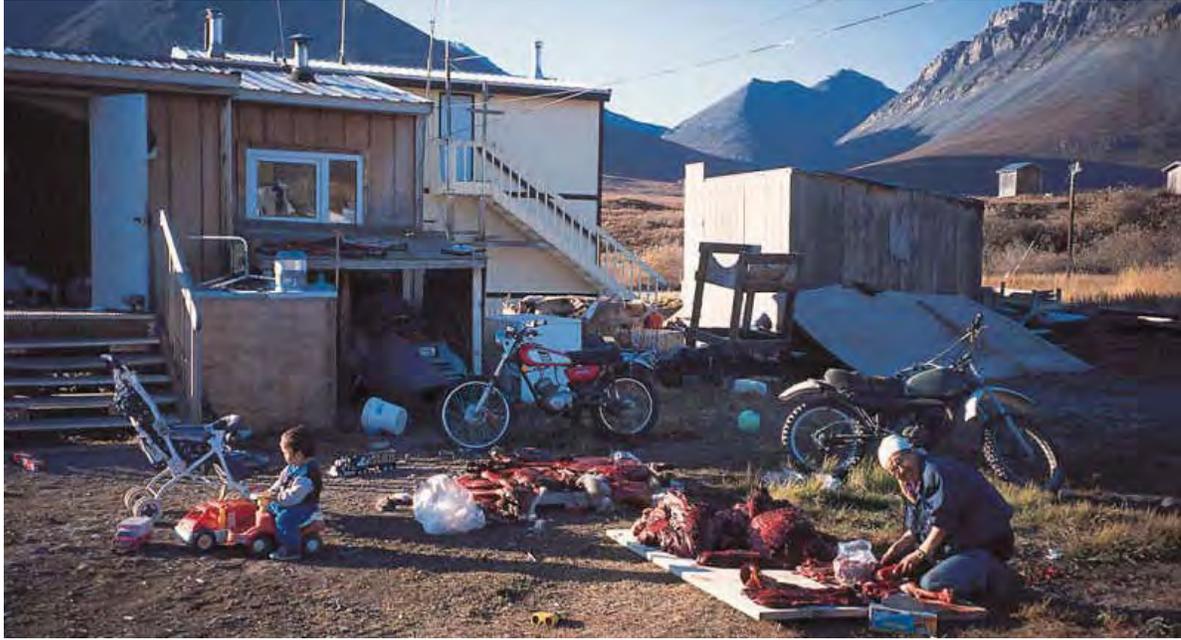
The communities in the North Slope region that use the lease sale area for subsistence hunting and fishing are Anaktuvuk Pass, Nuiqsut, Barrow and Kaktovik (Pedersen 2009). Caribou, brown bear, moose, furbearers, sheep, and waterfowl are harvested by subsistence users in and around the North Slope Foothills lease sale area (Map 5.1; Map 5.2; Map 5.3; Map 5.4; Map 5.5; Map 5.6).

Caribou is the primary subsistence resource for Anaktuvuk Pass residents (Brower and Opie 1996), and are also hunted year round by Nuiqsut residents along major rivers and where caribou migrate. Caribou are the main terrestrial animals harvested for subsistence in Barrow and Kaktovik, but sheep, muskoxen, and grizzly bears are also harvested. Dall sheep, wolves and moose are important subsistence resources, especially when caribou harvests are low. Other mammals harvested are the Arctic marmot, brown bear, ground squirrel, lynx, moose, red fox, snowshoe hare, weasel and wolverine (Bacon et al. *Unpublished*).

Subsistence users also fish in river habitats in the lease sale area. Arctic grayling, Arctic char, Dolly Varden, Arctic cisco, lake trout, whitefish, and burbot are common species that are harvested. The primary focus of subsistence hunting for the communities located closer to the Arctic marine environment is the harvest of marine mammals.

a. Sharing of the Harvests

One of the most important traditions in the Inupiat culture is the sharing of subsistence resources. Harvests of marine mammals are used to trade with inland villages for caribou and terrestrial mammal, bird and fish harvests. For example inland village residents may exchange dried caribou



Subsistence activities at Anaktuvuk Pass.

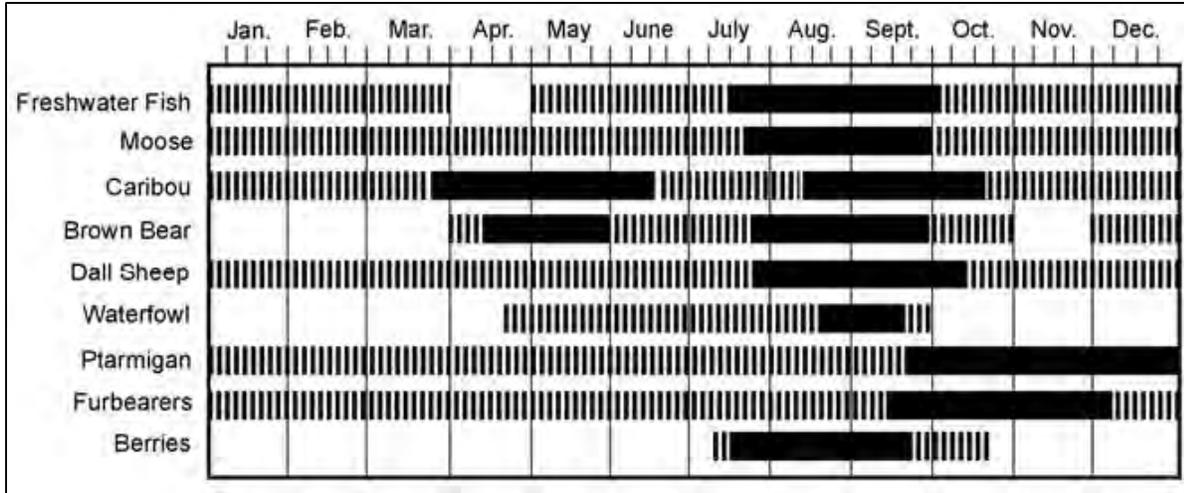
for whale skin and blubber (Bacon et al. *Unpublished*). In a study conducted by Brower and Opie (1996), for July, 1994 to June, 1995, they found that 75% of the harvests in Anaktuvuk Pass were shared. The hunters share with community members and guests, as well as during community feasts. The average percentage of Anaktuvuk Pass inhabitants involved in the sharing of the harvest from 1994 through 2003 was 63% (Bacon et al. *Unpublished*). In a subsistence harvest survey for Nuiqsut conducted by the North Slope Borough, researchers found that all subsistence hunters shared part of their harvest at least once, and that 87% of the harvest instances resulted in sharing (Brower and Hepa 1998).

b. Anaktuvuk Pass Subsistence Harvests

The most intensive subsistence users of the lease sale area are those from Anaktuvuk Pass, (population 284, ADCRA 2009a) the closest community to the lease sale area (Map 5.7; Map 5.8). It is located south of the lease sale area in the central Brooks Range (Map 3.1). When the Killik and Tulgak people decided to come together and settle, they chose Anaktuvuk Pass because of nearby water sources, the abundance of willows, and the known fact that thousands of caribou migrated through the pass each year (Anaktuvuk 2000; Brown 1978). Anaktuvuk Pass residents mainly use the river corridors of the Colville, Itkillik, and Anaktuvuk rivers for subsistence activities within the lease sale area (Pedersen and Hugo 2005). They also use the Killik and Chandler River corridors (Anaktuvuk 2000; Pedersen and Hugo 2005).

Subsistence harvest levels in this community are high and reliance on locally harvested resources is strong. The Native Alaskans of Anaktuvuk Pass, also known as the Nunamut, depend principally on caribou to support their lifestyle (Brown 1978). They primarily hunt terrestrial mammals such as caribou, Dall sheep, wolves and moose (Bacon et al. *Unpublished*, citing to Brower and Opie 1996). Other subsistence harvests are fish, birds and berries (Figure 5.1) (ADF&G 1986a). Hunting and trapping for the sale of skins, and making of traditional caribou skin masks or clothing provides income (ADCRA 2009a).

Information is unavailable as to how much of the subsistence hunting activities by Anaktuvuk Pass hunters occur in the lease sale area. Harvest estimates given below include plants, animals and fish that may have been harvested outside the lease sale area.



Notes: Solid lines indicate time when harvest usually takes place. Broken lines indicate occasional harvest effort.

Source: ADF&G 1986b.

Figure 5.1. Seasonal use harvest activities by Anaktuvuk Pass residents.

i. Plant Resource Harvests

Berry picking is an important subsistence activity in Anaktuvuk Pass. Berries, such as salmonberries, cranberries, cloudberry, and blueberries are gathered in July through October (Figure 5.1) (ADF&G 1986a). Berry picking may be done in conjunction with other subsistence activities like caribou hunting and fishing. Masu, or roots, are usually harvested in late summer (Bacon et al. *Unpublished*).

Subsistence harvest data from July 1, 1994 to June 30, 1995 in Anaktuvuk Pass reported that 7 gal of blueberries, 12 gal of salmonberries and 2 gal of cranberries were harvested by Anaktuvuk Pass residents (Brower and Opie 1996).

ii. Terrestrial Mammal Resource Harvests

Caribou is the primary subsistence resource in Anaktuvuk Pass (Brower and Opie 1996). The annual subsistence cycle of Anaktuvuk Pass relies on factors such as the caribou migration patterns. Intensive caribou hunting occurs in April and May as animals move through the Brooks Range on spring migrations northward (Map 5.7). Caribou hunting intensifies again in the fall, during late August to early November, as the animals begin to move southward (Brower and Opie 1996). During the winter, caribou are occasionally hunted, but they are in less desirable condition at this time of year (ADF&G 1986b). The subsistence harvest of caribou for 2006 was reported to be 696 caribou (ADF&G 2006a). The previous estimated caribou harvest in 1990-1991 was 592 animals and in 1993-1994 was 574 animals. In a previous survey conducted for a one-year period in 1994-1995, 311 animals were harvested. These caribou accounted for 82.5% of the harvest in edible pounds for a one-year period (Brower and Opie 1996; Table 5.1).

Sheep, moose and brown bear are considered important supplemental meat sources when caribou are scarce (Brower and Opie 1996). Sheep are harvested mostly in the late summer through early winter, primarily in July and August, with occasional spring harvests (Figure 5.1). Few estimates of harvests by Anaktuvuk Pass residents are available. The most recent estimates are for harvests from 1994 through 2003, ranging from 5 to 26 sheep harvested per survey period (Table 5.1;

Table 5.1. Estimated harvest by survey period for caribou, Dall sheep, Arctic grayling, and Dolly Varden, Anaktuvuk Pass.

Survey Period	Caribou		Dall Sheep		Arctic Grayling		Dolly Varden (Char)	
	Est.	SE.	Est.	SE.	Est.	SE.	Est.	SE.
1990 ^a	592							
1991 ^a	545							
1993 ^a	574							
1994-1995 ^b	311		26		898		207	
1996-1997 ^b	210.2	16.8	6.7	1.1	885.1	103.6	188.1	32.1
1998-1999 ^b	500.0	0.0	10.0	0.0	1173.0	0.0	152.0	0.0
1999-2000 ^b	329.3	23.8	9.2	0.6	1152.2	52.1	277.8	46.6
2000-2001 ^b	732.2	225.3	5.0	0.0	1800.0	606.5	583.0	312.2
2002-2003 ^b	436.1	26.3	16.0	2.4	839.0	258.6	153.5	231.4
2006 ^c	696							

^a Source: ADF&G 1990; ADF&G 1991; ADF&G 1993a.

^b Source: Bacon et al. *Unpublished*.

^c Source: ADF&G 2006a.

Bacon et al. *Unpublished*). Wolves were the most frequently harvested furbearer for the survey period, from 1994 through 2003.

iii. Bird Resource Harvests

The harvest of Canada geese and greater white-fronted geese occurs annually in the spring. Anaktuvuk Pass is close to the inland nesting range of the Canada geese, and is more distant from the coastal nesting areas of the greater white-fronted geese. Ptarmigan are harvested, with populations of willow and rock ptarmigan as likely primary sources. Harvest occurs mainly in winter and early spring (Figure 5.1). Other birds harvested are the northern pintail, ducks, and eiders (Bacon et al. *Unpublished*). In a previous study in 1992 the birds harvested were snow geese, greater scaup, common eider, brant and Canada geese (Brower and Opie 1996, citing to George and Fuller in prep.).

iv. Fish Resource Harvests

Fish are crucial during times of other resource scarcity. Important fish species include Arctic grayling, Arctic char, Dolly Varden, Arctic cisco, lake trout, whitefish, and burbot (Pedersen and Hugo 2005). Fish are primarily taken during the spring, summer and fall. Arctic grayling, Arctic char, lake trout and whitefish are harvested during July, August, and September. Between October and February fishing activity is minimal (Brower and Opie 1996; Pedersen and Hugo 2005).

Arctic grayling harvests were reported for several years from 1994 through 2003. The range of number of fish taken was from 898 fish in 1994-1995 to over 1000 fish in the years 1998 through 2001 (Table 5.1). In an assessment conducted from October 2001 through September 2003, the estimated fish harvest was 5,372 lb in the first year (October 2001 – October 2002), comprised of Arctic grayling (45%), Arctic char and Dolly Varden (28%), lake trout (26%), and burbot and Arctic cisco (less than 1%) (Pedersen and Hugo 2005).

In the second study year (October 2002 – September 2003), the estimated fish harvest was 4,284 lb, comprised of Arctic char and Dolly Varden (44%), Arctic grayling (27%), lake trout (27%), and burbot, Arctic cisco and other fish (1%) (Pedersen and Hugo 2005) (Map 5.8).

Some inhabitants travel to coastal villages to hunt marine mammals (Bacon et al. *Unpublished*). There is limited reliance on marine mammal hunting, with the exception of the sharing of the harvest among the North Slope villages and residents.

c. Other Communities Conducting Subsistence Hunting

The three communities north of the lease sale area that also conduct subsistence hunting in the North Slope Foothills lease sale area are Nuiqsut, Barrow and Kaktovik (Map 3.2) (Pedersen 2009). The residents of these villages may harvest resources in the lease sale area, but information is unavailable as to how much of the subsistence hunting activities for these communities occur in the lease sale area.

Various types of plants provide subsistence foods to residents of the North Slope area. Root species are generally harvested in August, while late summer and early fall are important times for gathering berries. Residents often pick berries in conjunction with other subsistence activities such as caribou hunting and fishing (Bacon et al. *Unpublished*). Common berries harvested are salmonberries, blueberries and cranberries (Braund and ISER 1993). Berries and plants may be available for only a short time. They are found along raised banks of streams and rivers and in areas of wet tundra (EDAW/AECOM 2007). Table 4.1 lists some of the plants that may be found in the North Slope area.

Terrestrial mammals are important subsistence resources for the residents of these three villages. Caribou is the primary terrestrial mammal source of food and is hunted year round, but the migration patterns influence the most active hunting seasons. Subsistence species tend to be migratory and seasonally abundant. Successful hunts require knowing when and where to intercept these resources as they migrate. For species that migrate through the area over a relatively short period, adverse weather conditions or equipment problems may result in missing the entire migration (Braund and ISER 1993).

Moose are also hunted along the river system habitats, such as the Colville, Chandler and Itkillik rivers in August (EDAW/AECOM 2007). Other furbearers are harvested in winter. Nuiqsut residents may hunt for wolf and wolverine by snow machine in March and April, and may take them while hunting for other species during the winter as the opportunity arises (Bacon et al. *Unpublished*).

Birds and bird eggs are an important component of the subsistence harvests in the three communities (Table 5.2; Map 5.6). Hunting of other migratory birds is regulated under the Migratory Bird Treaty Act. Subsistence hunting of spectacled eiders is closed, and non-toxic lead shot must be used for all waterfowl hunting (USFWS 1999). Although they make up only a small proportion of total harvests by weight, they may be important seasonally, and participation in bird hunting is high (EDAW/AECOM 2007). Hunting corresponds to the spring migration and the molt and fall migration. Eiders, geese, and ptarmigan are particularly important (Bacon et al. *Unpublished*). Ptarmigan are important in the early spring because they are found in flocks and are one of the few sources of fresh meat available at that time (EDAW/AECOM 2007). In some communities, birds are an important component of whaling events, when it is not uncommon for 200 ducks and geese to be used.

Fish harvests are important food staples for residents of these communities. Whitefish species are particularly important and are used for dog food as well as for human consumption. Species such as broad whitefish, which are considered the preferred fish by many residents, are generally harvested in the summer and fall with gillnets. They are filleted and dried, or stored in ice cellars. Arctic

Table 5.2. Estimated subsistence harvest and standard error (SE) of birds, by species, for Barrow, Nuiqsut, and Kaktovik.

Species	Barrow 2003 ^a		Nuiqsut 2000-2001 ^b		Kaktovik 2002-2003 ^c
	Harvest	SE	Harvest	SE	Harvest
American Widgeon					2
Brant	88	30			277
Canada Goose	3	2			33
Common Eider	317	67			12
Duck spp.	505	130			8
Eider spp.	2,568	707	55	4	18
Eider Eggs					30
Goose spp.	220	85	319	79	
King Eider	937	325	30	3	8
Mallard	86	83			1
Long-tailed Duck	25	14			5
Northern Pintail	18	12			2
Ptarmigan spp.	426	139	23	3	370
Sandhill Crane	2	1			1
Snow Goose	3	2			20
Spruce Grouse	18	12			
Steller's Eider	14	9			
Tundra Swan	2	1			
White-fronted Goose	3,314	487	787	188	149
White-fronted Goose Eggs	44	19			
Yellow-billed Loon	18	8			

Source: Bacon et al. *Unpublished*.

^a Calendar year.

^b July 2000 - June 2001.

^c July 2002 through June 2003. No standard error (SE) because survey was a census.

grayling and Dolly Varden are also highly prized (Bacon et al. *Unpublished*). Subsistence harvests also occur through the ice on overwintering concentrations of whitefish and Arctic grayling (EDAW/AECOM 2007).

i. Nuiqsut Subsistence Harvests

Nuiqsut (population 424, ADCRA 2009d) is located on the west bank of the Nechelik Channel in the Colville River delta. Although Nuiqsut is located approximately 60 miles north of the lease sale area, its residents use the foothills area to meet part of their subsistence needs. The Inupiat of Nuiqsut practice a traditional subsistence lifestyle where locally harvested foods and materials provide nourishment, clothes, tools and shelter (Brown 1979). Caribou, bowhead and beluga whale, seal, moose, and fish are staples of the diet. Polar bears are also hunted. Trapping and craft-making also provide some income (ADCRA 2009d). Caribou are the primary terrestrial mammal resources harvested by Nuiqsut residents and are hunted year round (Brower and Hepa 1998).

Nuiqsut hunters also harvest moose, wolves, wolverines, musk oxen, Arctic fox, cross fox, red fox, birds and other small animals (EDAW/AECOM 2007; Brown 1979). Hunting for birds includes Canadian and white-fronted geese, king eiders and common eiders. Spring hunts target geese, with spring and summer hunts harvesting eiders (Figure 5.2). Other birds harvested are other types of ducks and ptarmigan (Bacon et al. *Unpublished*). Fish harvests include thirteen types of fish,

including Arctic cisco, broad whitefish, humpback whitefish, Arctic grayling and burbot (Bacon et al. *Unpublished*). Whales are hunted in September, with some residents joining whaling teams in Barrow in the spring (Figure 5.2). Whale and marine mammal harvests are shared among other communities on the North Slope, such as Anaktuvuk Pass. Medicinal plants and greens are harvested when families are at camp hunting and fishing in late summer (EDAW/AECOM 2007). Blueberries, cloudberries, cranberries, wild potato, and wild rhubarb are also harvested (Jacobson and Wentworth 1982).

Few estimates of subsistence harvest are available. Previously in 1993, Nuiqsut subsistence residents harvested in 267,817 lb of locally obtained fish, game, birds and plants for local use. It is not known how much of the harvest came from the lease sale area. The mean household harvest was 2,943 lb of useable (dressed) food, or 742 lb per capita. Fish rank highest with an estimated community harvest of 90,490 lb, followed closely by terrestrial mammals and marine mammals at 87,390 lb and 85,216 lb, respectively. In 1993 caribou contributed 228 lb (94%), moose 12 lb (5%), and grizzly bear 2 lb (0.8%) to the per capita harvest. Subsistence harvested fish combined with terrestrial and marine mammals accounted for 98% of the community harvest, and birds/eggs and plants made up the remaining 2% of the community's harvest for 1993 (ADF&G 1993b). In July, 1994 through June, 1995, a Nuiqsut harvest subsistence survey by the North Slope Borough reported that the amount of edible pounds obtained were caribou (58%), fish (30%), moose (5%), birds (5%), and marine mammals (2%) (Brower and Hepa 1998).

Harvest information for caribou, whitefish, geese, eiders and bearded seals for the years of 1994-1995, 1995-1996, and 2000-2001 is presented in Table 5.3.

In 2003, subsistence resources made up at least half the food consumed for 81% of households in Nuiqsut (URS Corp. 2005c). Approximately 63% of the residents reported that at least half of their diet came from subsistence harvest activities. Nuiqsut households spent an average of \$6,700 on subsistence activities, and the community as a whole expended 20% of its gross income on subsistence activities (URS Corp. 2005c).

ii. Barrow Subsistence Harvests

Barrow (population 4,054, ADCRA 2009b) is located on the Chukchi Sea coast, ten miles south of Point Barrow. Residents practice a traditional subsistence lifestyle dependent upon marine mammal hunting and supplemented by inland hunting and fishing. Barrow residents harvest marine and riverine fish year round from locales along the Colville River and beyond into the foothills of the Brooks Range. Although many residents from throughout the North Slope Borough have relocated to Barrow, many continue to hunt in the areas where they were raised (Braund and ISER 1993). For example, Barrow residents with ties to Nuiqsut may return there for subsistence activities because

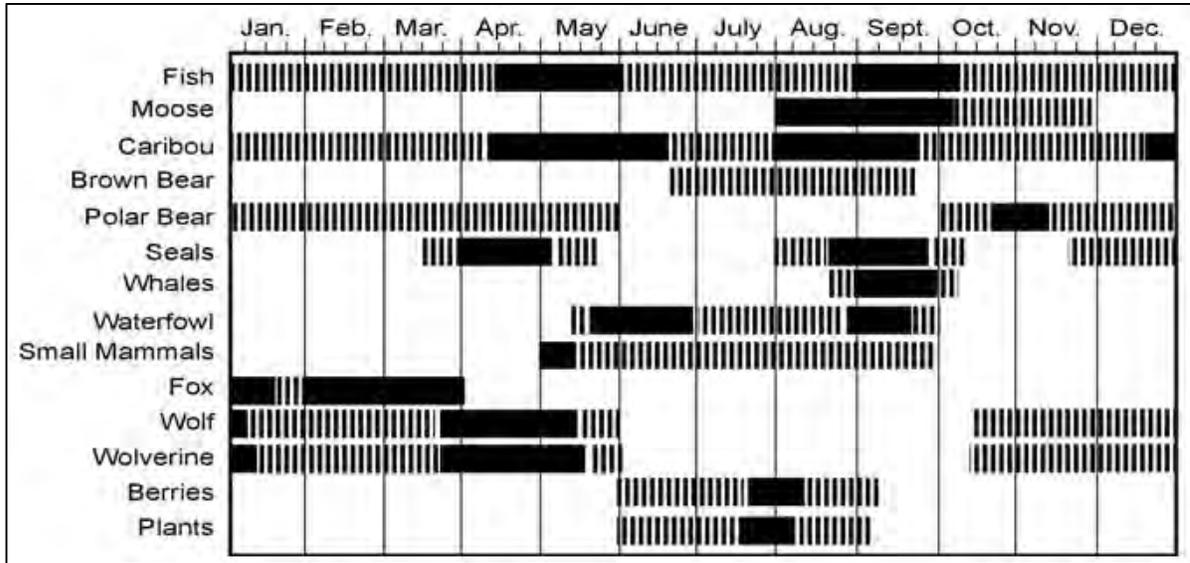


USGS

Ice fishing.

they continue to share use rights to cabins, camps, and allotments in the area (EDAW/AECOM 2007).

Although bowhead whale harvests tend to make up the largest proportion of total subsistence harvests, other species are also seasonally important, more so than their actual proportions may imply (EDAW/AECOM 2007; URS Corp. 2005a). These other species become even more important in years when few or no whales are harvested.



Notes: Solid lines indicate time when harvest usually takes place. Broken lines indicate occasional harvest effort.

Source: ADF&G 1986b.

Figure 5.2. Seasonal use harvest activities by Nuiqsut residents.

Table 5.3. Harvest of several species of wildlife and birds in the Nuiqsut area.

12-mo Period	Caribou	Large Whitefish ^a	Geese ^b	Walrus	Eiders ^c	Bearded Seals
1994-1995	258	3,419	474	0	90	0
1995-1996	362	3,419	381	0	287	17
2000-2001	496	5,533	1,172	0	86	1

Source: Bacon et al. *Unpublished*.

^a Includes broad whitefish, humpback whitefish, and unidentified whitefish.

^b Includes greater white-fronted goose, Canada goose, snow goose and brant.

^c Includes common eider, king eider, spectacled eider, and Steller's eider.



Caribou harvest.

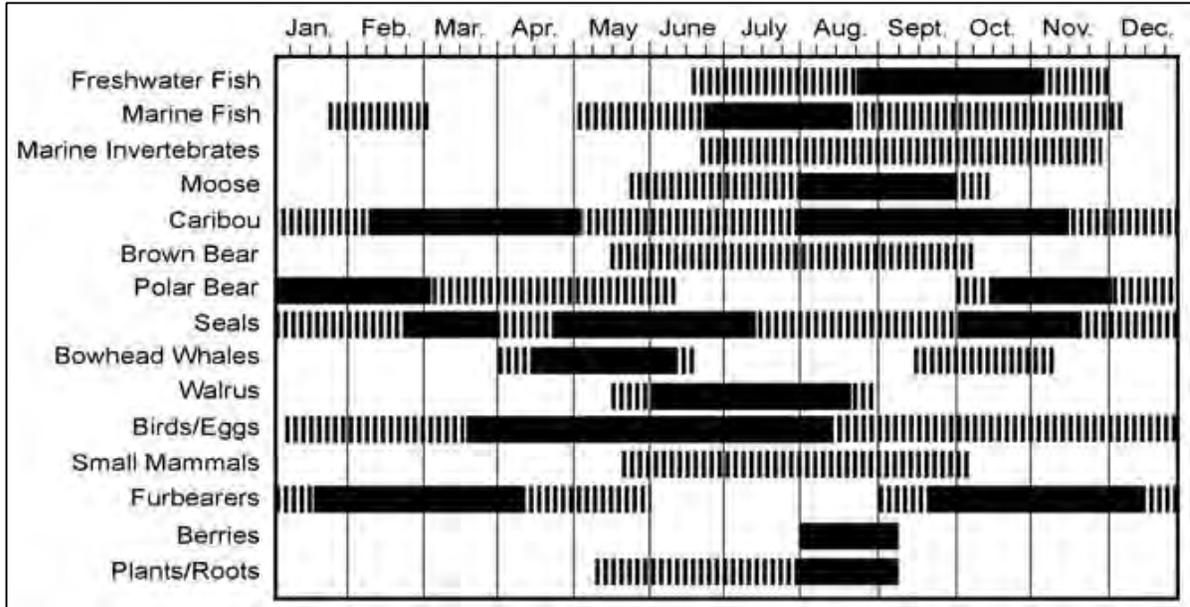
Caribou is the main terrestrial animal harvested for subsistence in Barrow, where harvest activities peak from February through early April, and from late June through late October (EDAW/AECOM 2007). Harvests fluctuate from year to year, depending on proximity of overwintering caribou to Barrow (Figure 5.3). In 2002-2003, 2,092 caribou were harvested by Barrow residents (Table 5.4). Barrow residents may hunt moose along the Colville River during the summer (EDAW/AECOM 2007). In Barrow, most moose hunting is conducted by non-Natives. During the winter hunters from Barrow harvest other furbearing animals (Bacon et al. *Unpublished*). In Barrow, eider harvests generally occur in July (Figure 5.3). Eiders, geese, and ptarmigan are particularly important (Bacon et al. *Unpublished*), with over 4,700 eiders and over 3,300 geese taken in Barrow in 2003 (Table 5.4). In 2003, over 91% of Alaska Native households in Barrow participated in local subsistence activities, and for 66% of the households, at least half of their diet consisted of local subsistence resources (EDAW/AECOM 2007 citing to Circumpolar Research Associates 2004). Harvest information for caribou, whitefish, geese, eiders and bearded seals for the years of 1994-1995, 1995-1996, and 2000-2001 is presented in Table 5.4.

iii. Kaktovik Subsistence Harvests

Kaktovik (population 272, ADCRA 2009c) lies approximately 100 mi northeast of the lease sale area on Barter Island, off the coast of ANWR. Residents of Kaktovik have a unique set of natural resources available for subsistence. Because of Kaktovik's location, hunters have access to terrestrial, riparian, and marine resources. Subsistence activities, particularly those surrounding the bowhead whale hunt, are central to the structural organization and cultural identity of Kaktovik residents. Although the bowhead whale is the primary marine mammal subsistence species, seals and polar bears are also important. Whales are hunted in spring and fall, and seals are hunted year round (Figure 5.4). Residents harvest both marine and freshwater fishes. The species of fish harvested are Arctic cisco, Dolly Varden, sculpin, Arctic cod, Arctic flounder, Arctic grayling, and chum salmon (Brower et al. 2000). Caribou are the most important terrestrial subsistence resource, but sheep, muskoxen, and grizzly bears are also harvested (Galginaitis and Koski 2002). Bird species harvested include geese (Table 5.5) and ptarmigan (URS Corp. 2005b).

In 1998, subsistence resources made up at least half the food consumed for 83% of households; this decreased to 69% of households in 2003 (URS Corp. 2005b citing to Shepro et al. 2003). Residents

have noted that they are involved in a wider range of activities and responsibilities, and that they travel away from the village more often for a wide variety of reasons. These lifestyle changes may limit their subsistence activities and constrain the timing of subsistence activities. Some residents prefer seasonal work because it allows them to participate more fully in subsistence activities (EDAW/AECOM 2007).



Notes: Solid lines indicate time when harvest usually takes place. Broken lines indicate occasional harvest effort.

Source: ADF&G 1986b.

Figure 5.3. Seasonal use harvest activities by Barrow residents.

Table 5.4. Harvest of several species of wildlife and birds in the Barrow area.

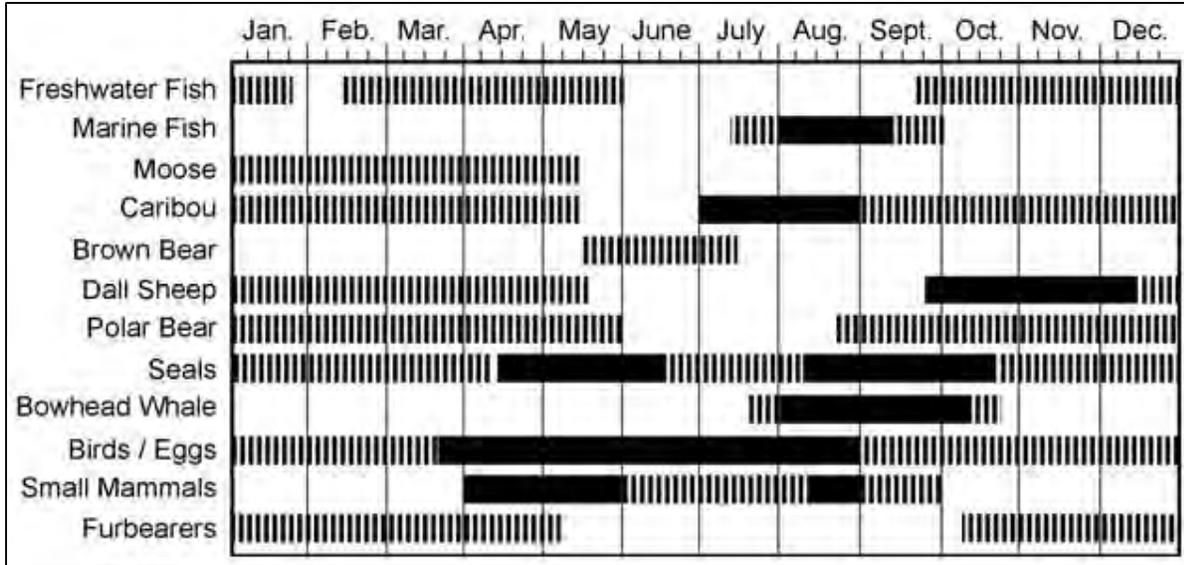
12-mo Period	Caribou	Large Whitefish ^a	Geese ^b	Walrus	Eiders ^c	Bearded Seals
1995-1996	2,155	12,084	2,599	74	12,114	431
1996-1997	1,158	7,657	1,856	78	2,572	192
1999-2000 ^d	3,359	23,213	7,550	115	2,572	729
2000-2001 ^d	1,820	2,177	4,893	123	2,201	327
2002-2003 ^d	2,092	8,899	3,321	313	4,773	776

Source: Bacon et al. *Unpublished*.

^a Includes broad whitefish, humpback whitefish and unidentified whitefish.

^b Includes greater white-fronted goose, Canada goose, snow goose and brant.

^c Includes common eider, king eider, spectacled eider and Steller's eider.



Notes: Solid lines indicate time when harvest usually takes place. Broken lines indicate occasional harvest effort.

Source: ADF&G 1986b.

Figure 5.4. Seasonal use harvest activities by Kaktovik residents.

Table 5.5. Harvest of several species of wildlife and birds in the Kaktovik area.

12-mo Period	Caribou	Large Whitefish ^a	Geese ^b	Walrus	Eiders ^c	Bearded Seals
1994-1995 ^d	78	0	273	0	111	21
2002-2003	112	3	479	0	38	8

Source: Bacon et al. *Unpublished*.

^a Includes broad whitefish, humpback whitefish, and unidentified whitefish.

^b Includes greater white-fronted goose, Canada goose, snow goose and brant.

^c Includes common eider, king eider, spectacled eider and Steller's eider.

3. Sport Fishing

Sport fishing traffic in the interior region of Alaska is lighter than in other regions of the state (ADF&G 2007d). Sport fishing in the lease sale area focuses on Dolly Varden and Arctic grayling, with smaller harvests of salmon, trout, whitefish, northern pike and burbot (NRC 2003, citing to Howe et al, 2001). Dolly Varden and Arctic char are grouped together for sport fishing regulatory purposes because of the difficulty in distinguishing the species based on external characteristics (Scanlon 2008). Dolly Varden and Arctic char populations can generally support only low rates of exploitation. The Sagavanirktok River is one of the primary rivers for sport fishing for these species. Anglers access the Sagavanirktok River by the Dalton Highway which parallels much of the river. The Sagavanirktok River is the only specific location for which sport effort and harvest estimates are available: effort averaged 1,232 angler-days, harvest of Dolly Varden averaged 272 fish, and harvest of Arctic grayling averaged 205 fish from 1998-2007 (Table 5.6). Although a



The Sagavanirktok River.

portion of the Sagavanirktok River runs through the lease sale area, harvest statistics are for the entire river.

Fishing effort and harvest of Arctic char, Dolly Varden, Arctic grayling, and lake trout were expected to increase when the entire Dalton Highway was opened to the public in 1994, and again when improvements were made to the road south of Atigun Pass in 2001 and 2002. However, effort and harvest statistics show that this has not occurred (Scanlon 2008). Increases in catch and harvest are expected from increased visitors floating rivers of the Alaska National Wildlife Refuge, particularly the Kongakut, Hulahula, and Canning rivers (Scanlon 2008).

4. Sport Hunting and Trapping

Sport harvesting of big and small game in the lease sale area is managed by ADF&G, Division of Wildlife Conservation. The state is divided into 26 game management units (GMU). The lease sale area includes portions of GMUs 26A and 26B (Map 4.1). It is unknown exactly how many animals of each species are harvested within the lease sale area in any given year. Sport hunting harvest statistics collected by ADF&G are not specific to the lease sale area, but estimate the harvest of whole GMUs (ADF&G 1996). ADF&G reported that in 2006-2007, 1,050 caribou from the CAH, 19 moose, 77 sheep and 35 wolf were harvested in GMU 26 (Table 5.7). Management reports of documented harvest information is available in ADF&G publications (ADF&G 2008b moose; ADF&G 2007c caribou; ADF&G 2007b brown bear; ADF&G 2006b wolf; ADF&G 2008a Dall sheep; ADF&G 2007f muskox; ADF&G 2007e furbearers).

Hunting seasons and guidelines are determined by the Alaska Board of Game, and administered by ADF&G. The Dalton Highway corridor (extending 5 miles from each side of the highway) is closed to big and small game hunting, except with bow and arrow, and use of motorized vehicles is restricted in the corridor. Firearm possession by oil and gas industry employees is restricted and workers are not likely to sport hunt in the area during their active-duty shifts (ADF&G 1996). A hunting lodge is operated in Umiat, located in the northwest area of the lease sale area, and hunters and fishers charter aircraft for access (NSBCMP 2007).

Table 5.6. Sport effort and harvest at the Sagavanirktok River, 1998-2007.

Year	Anglers	Trips	Angler Days	Dolly Varden	Arctic Grayling	Burbot
1998	374	620	840	812	370	0
1999	367	1,844	2,055	330	181	0
2000	459	742	1,108	105	107	0
2001	359	1,615	2,537	757	206	7
2002	322	922	1,162	257	282	0
2003	242	375	423	0	163	22
2004	316	315	437	105	23	50
2005	614	535	1,042	51	354	0
2006 ^a						
2007	391	1,281	1,482	30	158	0
Average	383	917	1,232	272	205	9

^a Too few surveys specific to the Sagavanirktok River were returned to make estimates in 2006.

Source: Jennings et al. 2004, 2006a, b, 2007; *In prep.*-a, b, c.

Table 5.7. Sport harvest of big game in Game Management Unit 26, regulatory years 2002-2003 through 2006-2007.

Regulatory Year	Species						
	Brown Bear	Caribou Herd		Moose	Muskox	Sheep	Wolf
		Teshekpuk ^a	Central Arctic ^b				
2002-2003	28	2,700	760	12	7	58	8
2003-2004	30	2,700	311	5	3	75	19
2004-2005	32	4,642	625	6	8	93	10
2005-2006	19	4,460	687	14	4	92	16
2006-2007	30	4,050	1,050	19	0	77	35
Average	28	3,710	687	11	4	79	18

^a Game Management Unit 26A. Harvest for this herd was estimated by the area management biologist.

^b Game Management Units 26B and 26C. The 2006-2007 harvest was estimated by the area management biologist.

Source: ADF&G 2007a.

Notes: Most of these harvest totals do not include unreported harvest which may be substantial and can even exceed the reported harvest for certain caribou herds. In addition most harvest totals do not include harvest from federal hunts. Harvest estimates for the 2006-2007 regulatory year are considered preliminary.

5. Commercial Fishing

There are no commercial fishing operations within the lease sale area, but a commercial fishery interest was previously located downriver to the north on the Colville River (Hayes et al. 2008). Information about whether this commercial fishery could resume in the future is not available.

C. Other Uses

1. Tourism and Recreation

Tourism in the North Slope area includes activities based upon packaged tours, back country adventures and sport fishing and hunting (NSBCMP 2007). Tour companies offer guided excursions by air and bus. Independent travelers can drive the Dalton Highway from Fairbanks to Deadhorse, but basic travel services are not generally available on the highway (NSBCMP 2007). There are no public services along the route except for Yukon Crossing, Five Mile, Coldfoot, Wiseman and Deadhorse, and some services are only available in summer (BLM 2007).

Recent information provided by the Alaska Visitor Statistics Program reported tourist visitor information for 2006. The survey conducted for visitor activities in the Far North region of Alaska showed that there were 49,000 summer visitors, with 11,000 to Nome and 41,000 visited the other areas of the Far North (McDowell Group 2007). The volume of visitors to the Far North was about 3% of the total summer visitors in 2006, with 1% to Nome and 2% to other areas of the Far North (McDowell Group 2007). The trip purposes for the Far North were reported as vacation/pleasure (76%), visiting friends and relatives (8%), business only (9%), and combined business and pleasure (7%). The primary tour package types taken were adventure tour (35%), wilderness lodge (20%), fishing lodge (1%) and other rail or motorbus based tours (19%) (McDowell Group 2007).

Recreational uses of the lease sale area include hiking, skiing, flight-seeing, boating and rafting. Each of these activities has its associated costs, which can be very high in the Arctic. Considering the remoteness and isolation of the lease sale area, most recreationists use a commercial outfitter to access the area, and nearly all must fly in. Back country and ecotourism adventures are offered. Most outfitters are based out of Fairbanks. In summer, visitors come to the region to camp, hike, float down the Canning River in a river raft, or watch and film whales, birds or caribou.

The Dalton Highway, running north south through the lease sale area, offers a road accessible Brooks Range experience for those seeking a rugged wilderness journey (NPS 2009a). In addition, those seeking recreation experiences can visit nearby public lands. The lease sale area abuts the boundaries of the Gates of the Arctic National Park and Preserve and a small portion of the Noatak National Preserve. The Gates of the Arctic Park offers the opportunity for extreme wilderness recreation activities such as backpacking, river running, mountaineering, and dog mushing. The remote location and extreme climate of the Brooks Range requires travelers to have exceptionally strong wilderness skills and flexibility to adjust plans. The Noatak National Preserve occupies a dramatic river basin ringed with mountains forming the western Brooks Range. The preserve is used for camping, backcountry hiking, fishing, wildlife observation and photography (NPS 2009b).

2. Mining

A proposed coal prospecting permit for the Nanushak project has been applied for within the lease area, and is being considered by the DMLW. Coal prospecting permits are issued rather than a mining lease where the Division of Geological and Geophysical Sciences (DGGS) has determined that the potential for mineable coal deposits is low. The proposed permitting area lies along the northern foothills of the Brooks Range, in an east-west belt extending from approximately 5 mi west of Toolik Lake to Banded Mountain, just west of the Anaktuvuk River (Map 5.9). The nearest community is Anaktuvuk Pass, approximately 36 mi south-southwest of the western end of the

proposed permitting area. The affected anadromous streams are the Anaktuvuk, Nanushuk, Kanayut, and Itkillik rivers, and May Creek. A coastal consistency determination and DMLW best interest finding was completed. The exact location of any coal deposits and the resulting mining operation cannot be predicted at the time of the writing of this DO&G final best interest finding.

3. Oil and Gas

There has been limited oil and gas exploration and development in the lease sale area. The locations of previously drilled wells in and near the lease sale area are found in Map 5.9 and Map 5.10. Chapter Six provides a detailed description of the history of the oil and gas industry in the lease sale area as a comparison for potential future exploration and resource development uses of the North Slope Foothills area.

4. Transportation by Roads and Trails

Many trails exist in the lease sale area, including a portion of the Hickel Highway. Construction of the Hickel Highway was begun in December, 1968, and was completed in March, 1969. It originates in Livengood, Alaska and continues about 547 mi north, ending at a landing airstrip at Sagwon, Alaska. It is a designated RST 450 trail that exists within the lease sale area along the Anaktuvuk River in sections 16, 17, 20, and 21, T9S, R4E UM. The Hickel Highway is a qualified RS 2477 route, and any oil and gas or other mineral prospecting activities will be subject to this right-of-way (ADNR 2009; ADEED 2009). Other trails or routes with an established history of use may exist in the lease sale area.

The James Dalton Highway is also known as the Haul Road. It was built in 1974, and is a 414 mi long road starting in Livengood, Alaska continuing north to Deadhorse and the oil fields on the North Slope. It is located in the eastern portion of the lease sale area. The Trans-Alaska pipeline parallels the road for much of the route. The road can be used by the general public, but few travel services are available (BLM 2007).



R. Cadigan, DOTPF

The Dalton Highway.

The North Slope Borough has about 107 mi of roads, excluding the Dalton Highway and the oil field roads: Anaktuvuk Pass has 58 mi of roads; Nuiqsut has 9.4 mi; Barrow has 51 mi; and Kaktovik has

9.9 mi of roads (NSBCMP 2007). Nuiqsut is connected to the Dalton Highway by an ice road through the oil field road infrastructure for 5 to 7 months each year (NSBCMP 2007).

A state of Alaska effort is underway to determine a preferred route for a future road from the Trans-Alaska pipeline to Umiat. The project is the foothills west transportation access project to construct a road from the Dalton Highway to Umiat. The road will provide access to estimated oil and gas resources in the northwestern foothills and the National Petroleum Reserve-Alaska (NPR-A). The project will be constructed in phases, with the initial planned phase extending from the Dalton Highway to the Gubik oil and gas field located north and outside of the northwest portion of the lease sale area (Map 5.9 and Map 5.10). A second planned phase will be to continue road construction from the Gubik oil and gas field to Umiat, including construction of a bridge across the Colville River and building an additional 15 mi of roadway (ADOT 2010).

Inter-village travel in the NSB is accomplished with the use of trails using snow machines in winter and All Terrain Vehicles (ATV) in summer. There is a trail between Nuiqsut and Anaktuvuk Pass that is reported to be about 140 mi long (NSBCMP 2007). “Cat-trains” that use inflated tires that do not damage the tundra are also used to transport freight. In addition the NSB maintains about 43 mi of ice roads each year (NSBCMP 2007).

5. Research Facilities

The University of Alaska Fairbanks Institute of Arctic Biology Toolik Field Station is an active research facility located at Milepost 284 on the Dalton Highway within the lease sale area. It is about 158 mi north of the Arctic Circle.

Establishment of this research center was related to the construction of the Dalton Highway, also known as the Haul Road, that opened areas of northern Alaska to access and research (Shaver 2009, citing to Alexander and VanCleve 1983).



J. Laundre, MBL

Toolik Research Station.

In 1975 an aquatic study was begun of the lakes and streams near Toolik Lake. A camp was located on an old airstrip near a former road construction camp with the objective of researching the aquatic

biomass, productivity and the cycles of organisms in Toolik Lake. By 1979 terrestrial ecosystem studies were being conducted on plant growth within the tundra environments and the effects of disturbance. A series of active research projects were conducted about ecosystem processes and Arctic lakes over the next several decades (Shaver 2009). Currently research based at Toolik Lake field station covers topics related to the Arctic. These include research in terrestrial and aquatic ecology, atmospheric science, physical sciences, physiology of arctic breeding birds, mammals and insects, and includes a broad range of temporal and spatial scales (UAF 2009).

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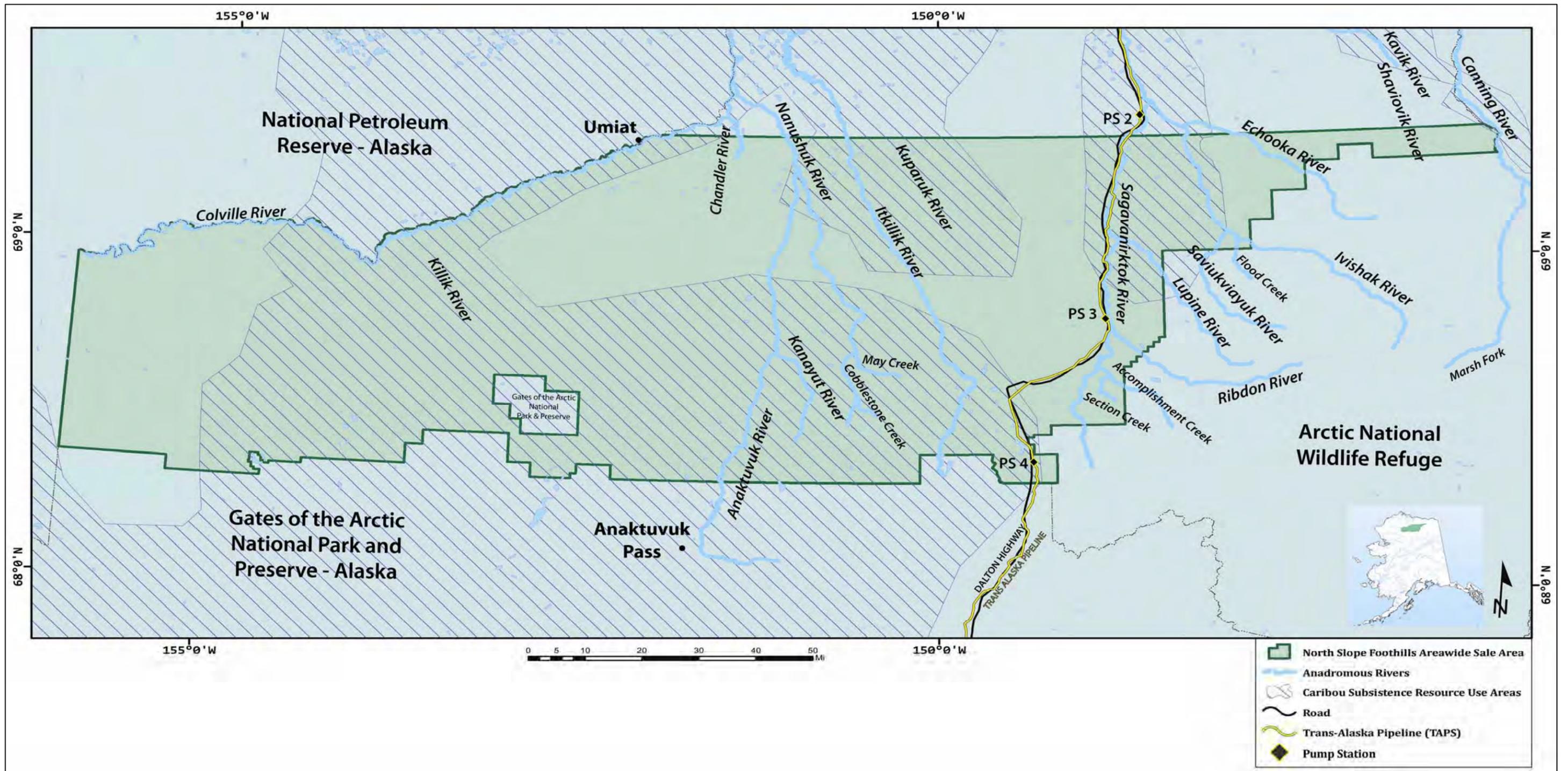
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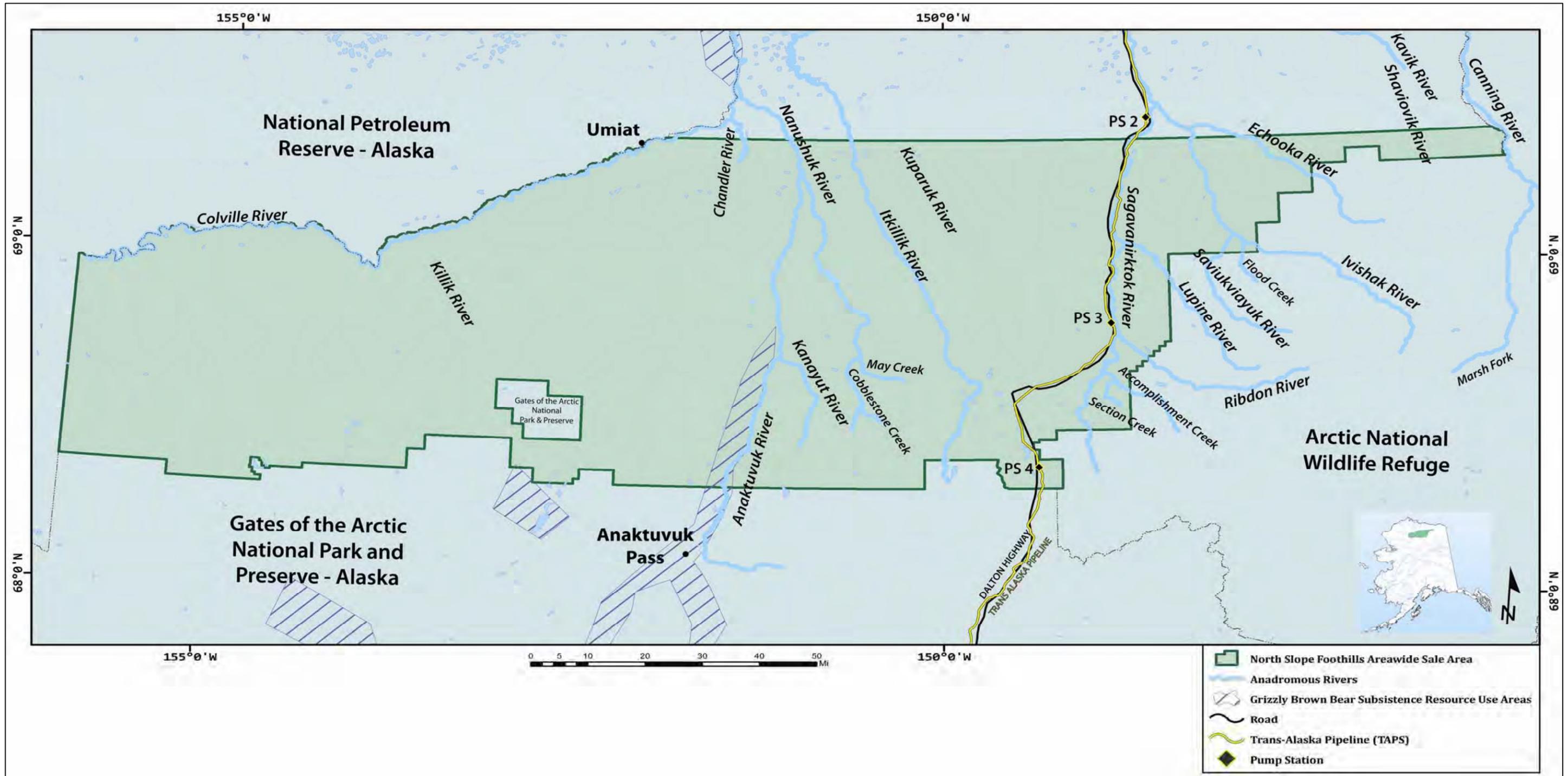
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E. Maps



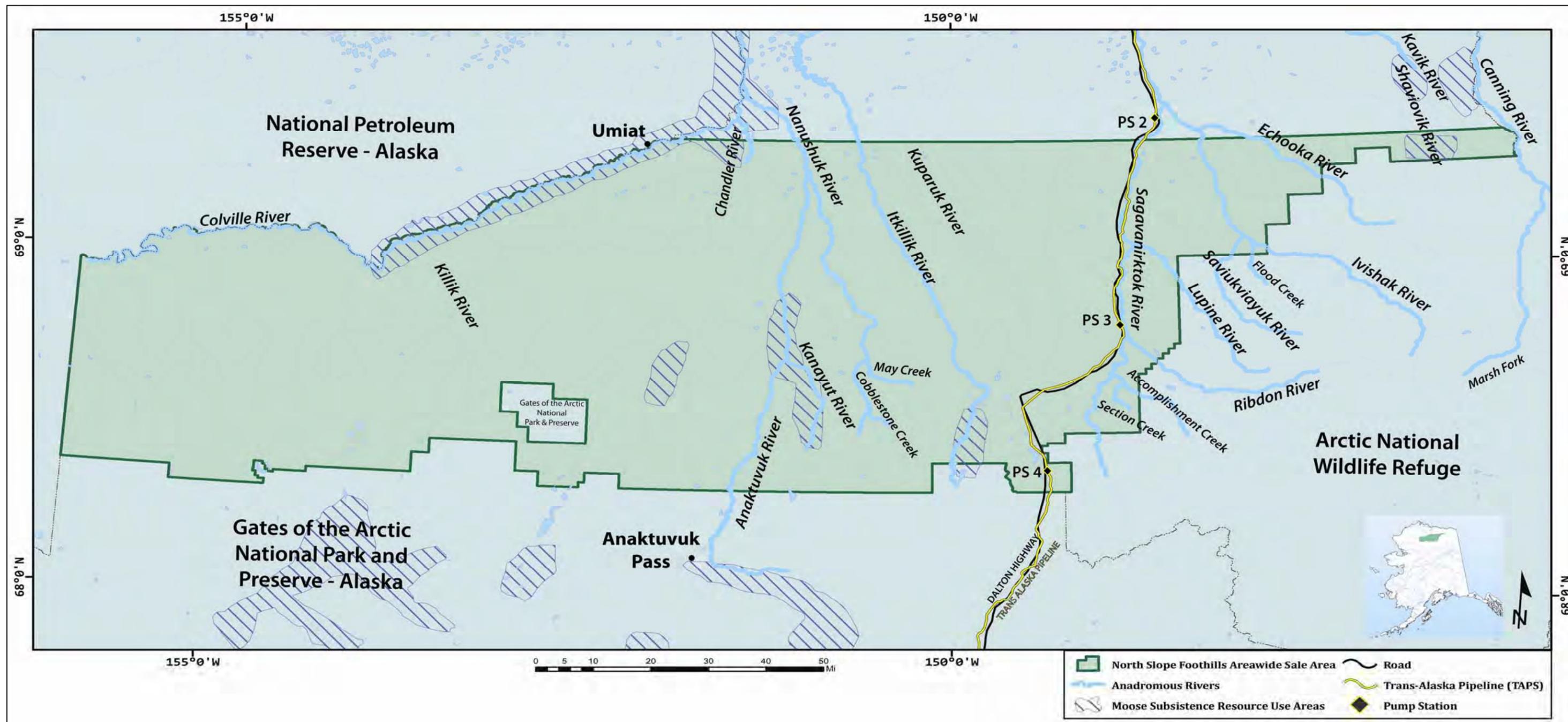
Source: Pedersen 1979.

Map 5.1. Caribou subsistence resource use areas.



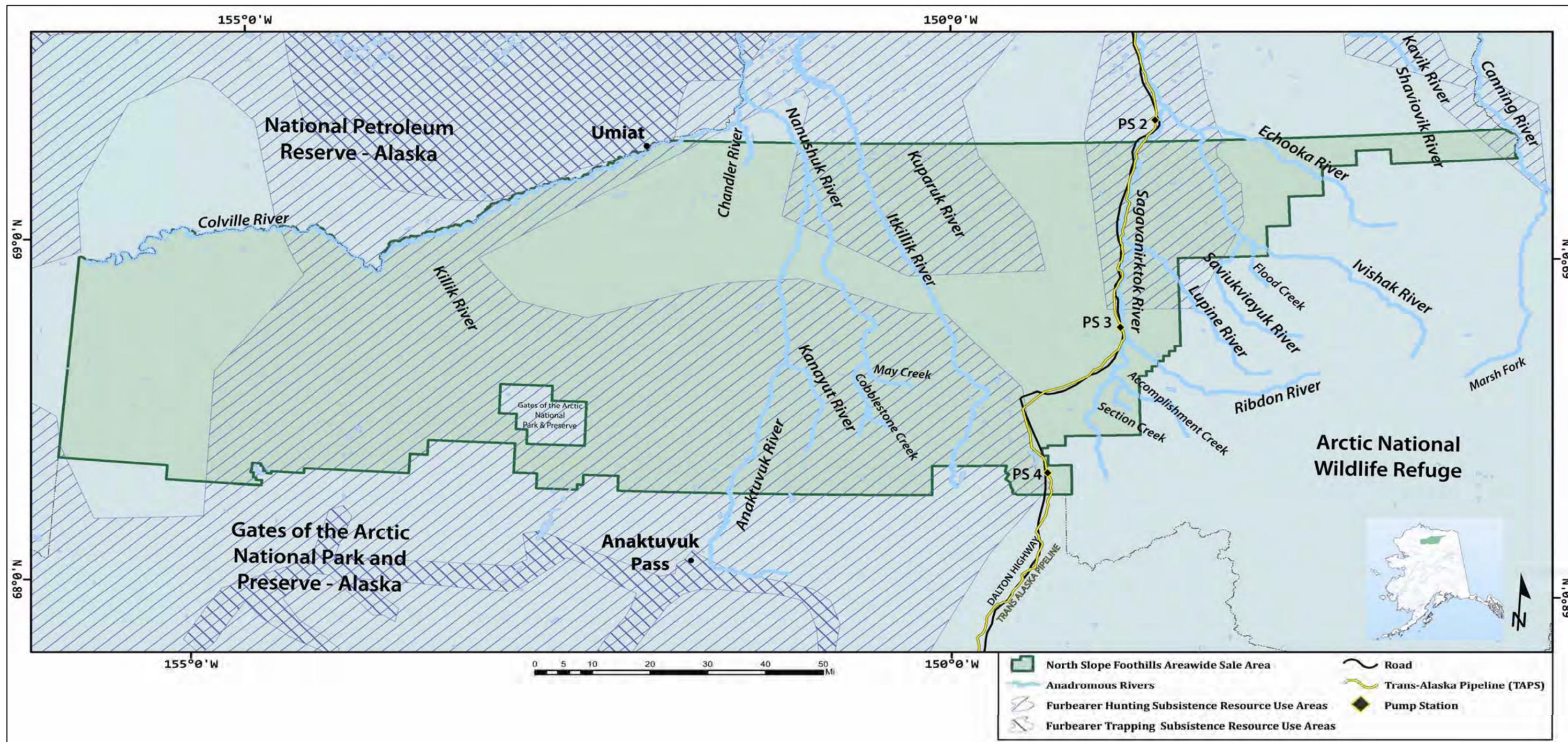
Source: Pedersen 1979.

Map 5.2. Brown bear subsistence resource use area.



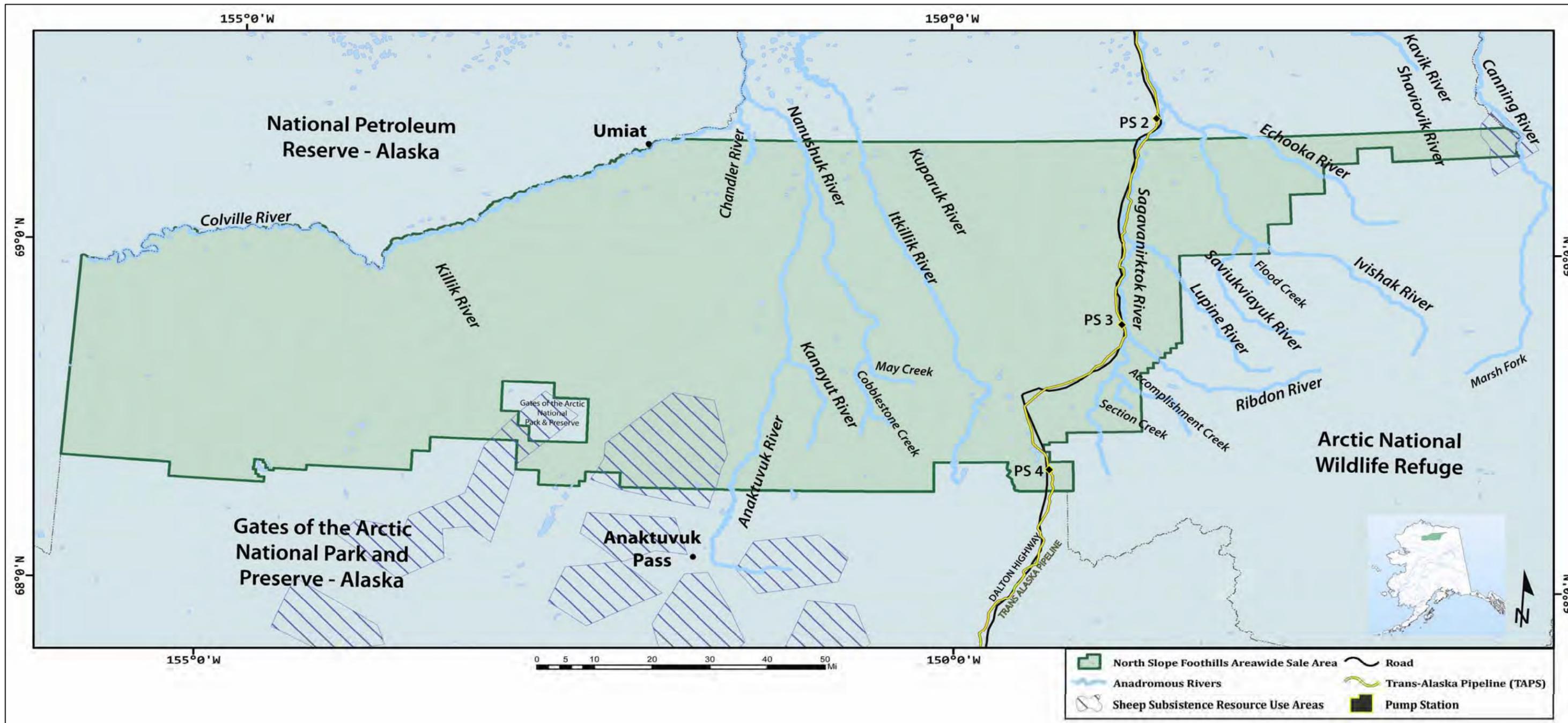
Source: Pedersen 1979.

Map 5.3. Moose subsistence resource use areas.



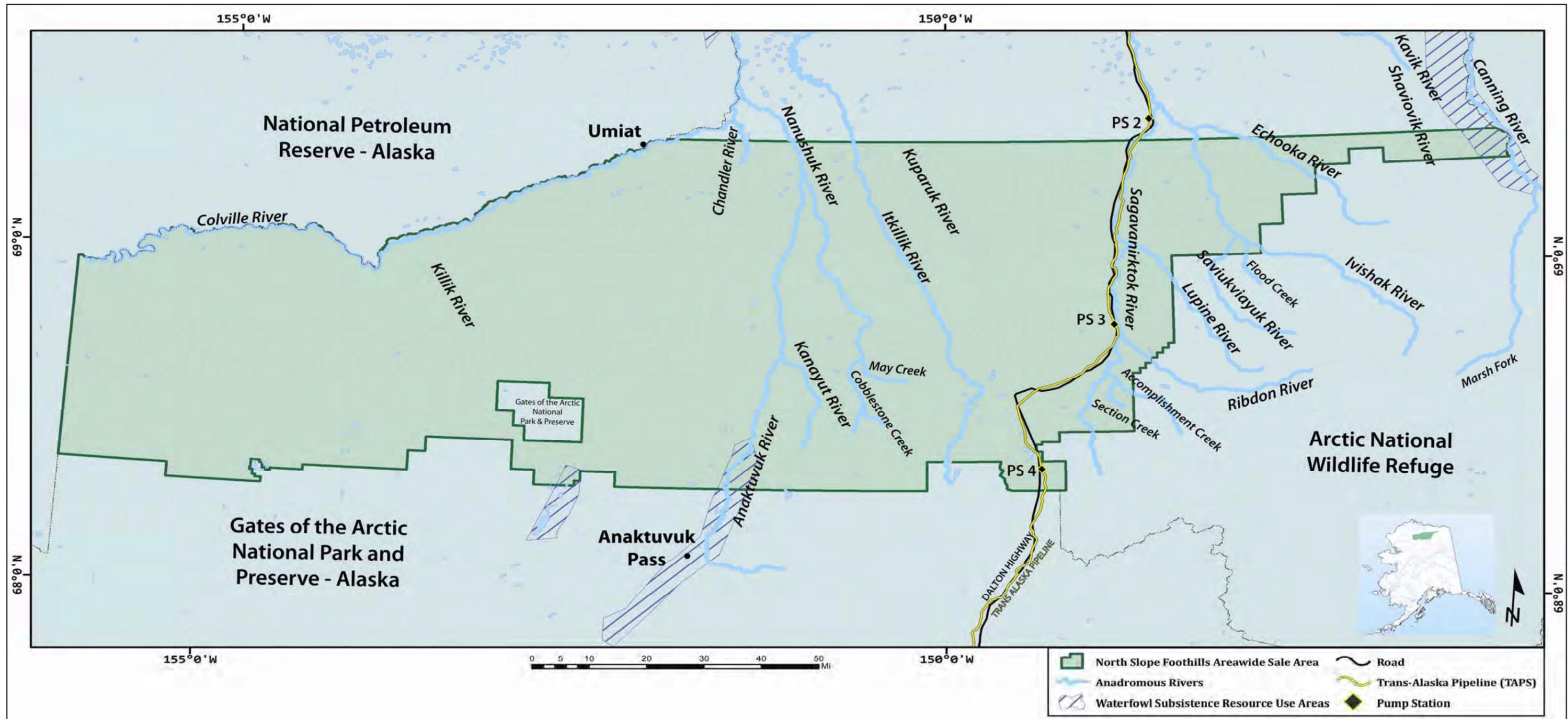
Source: Pedersen 1979.

Map 5.4. Furbearer hunting and trapping subsistence resource use areas.



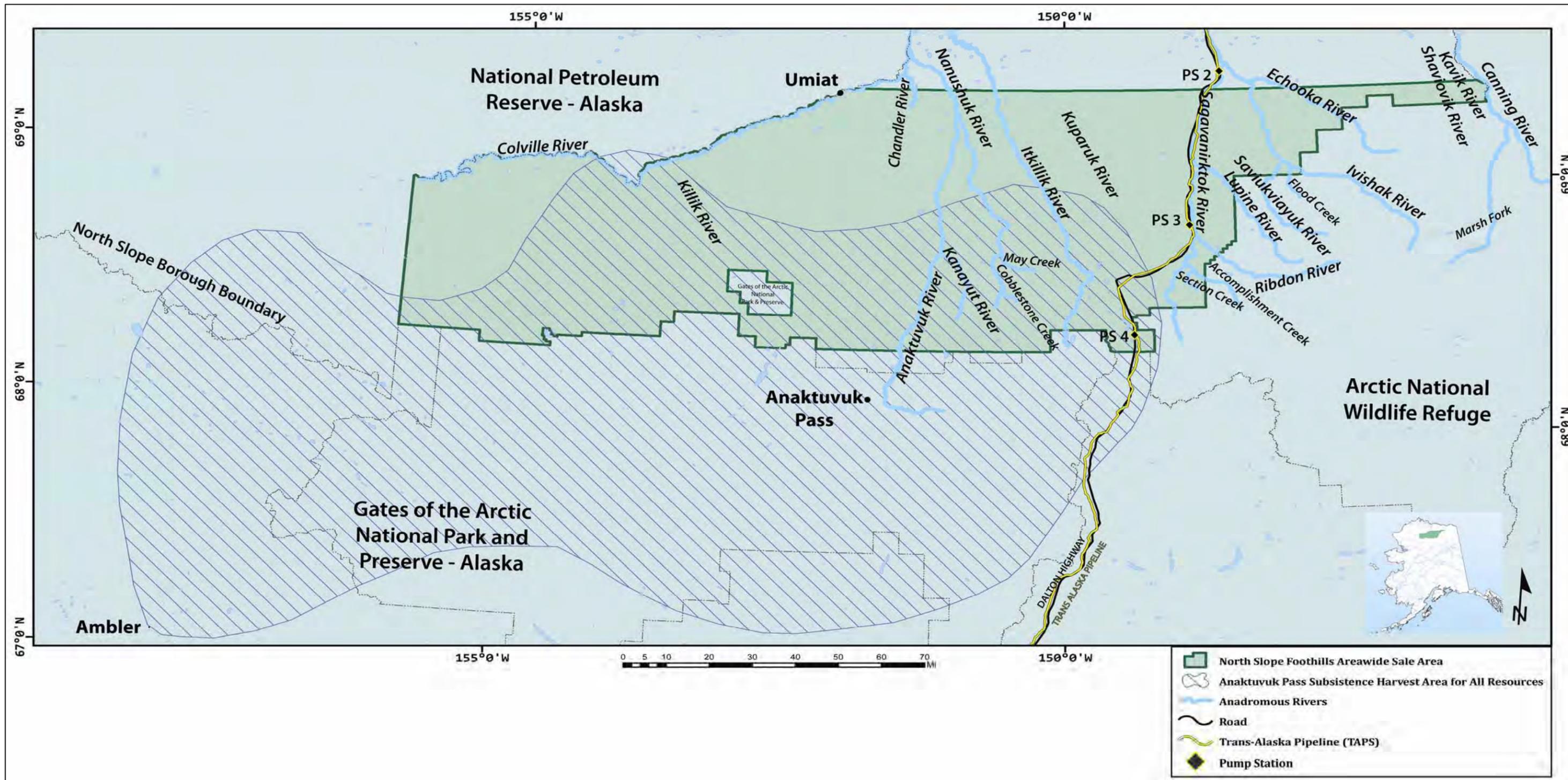
Source: Pedersen 1979.

Map 5.5. Sheep subsistence resource use areas.



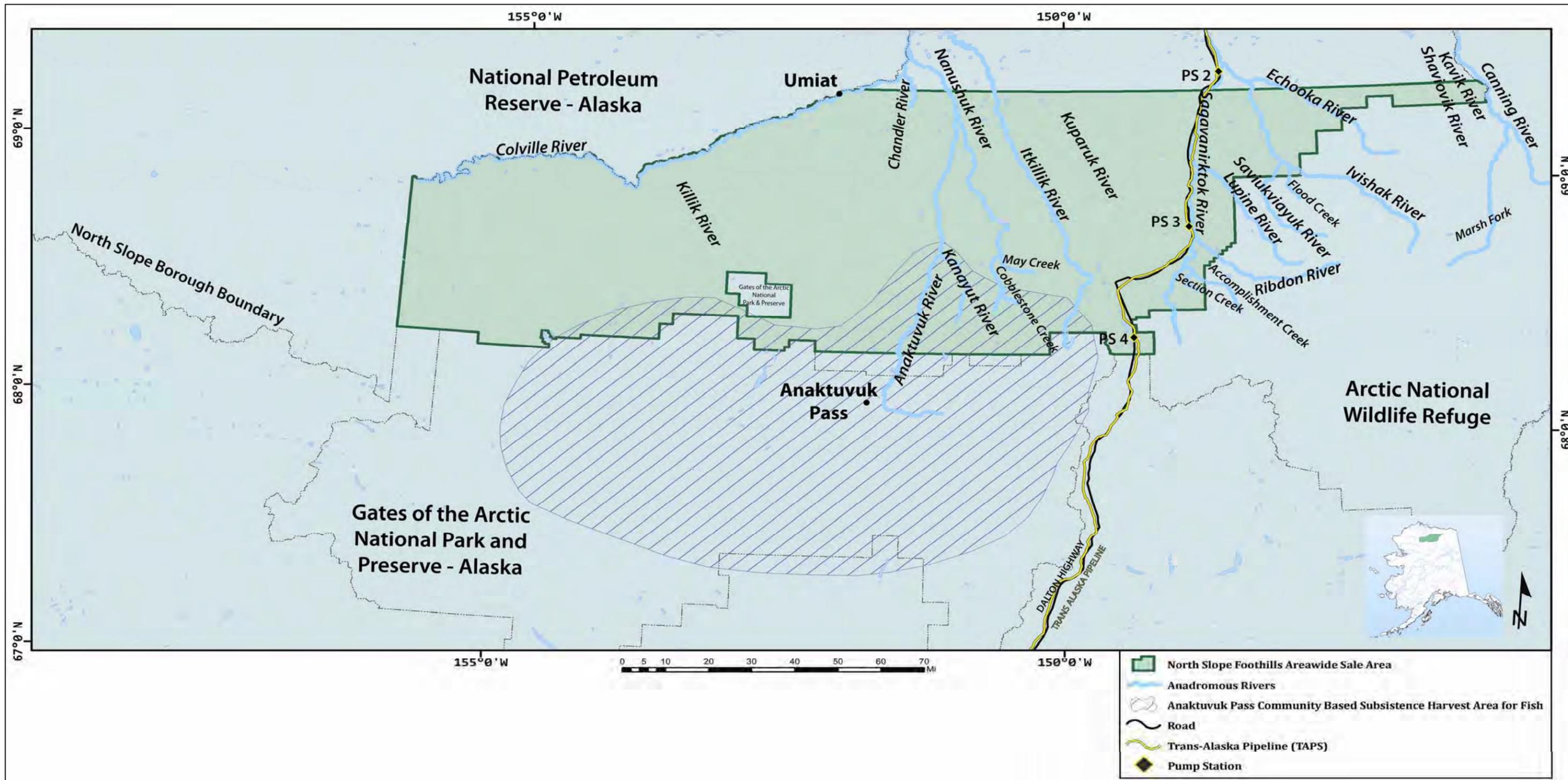
Source: Pedersen 1979.

Map 5.6. Waterfowl subsistence resource use areas.



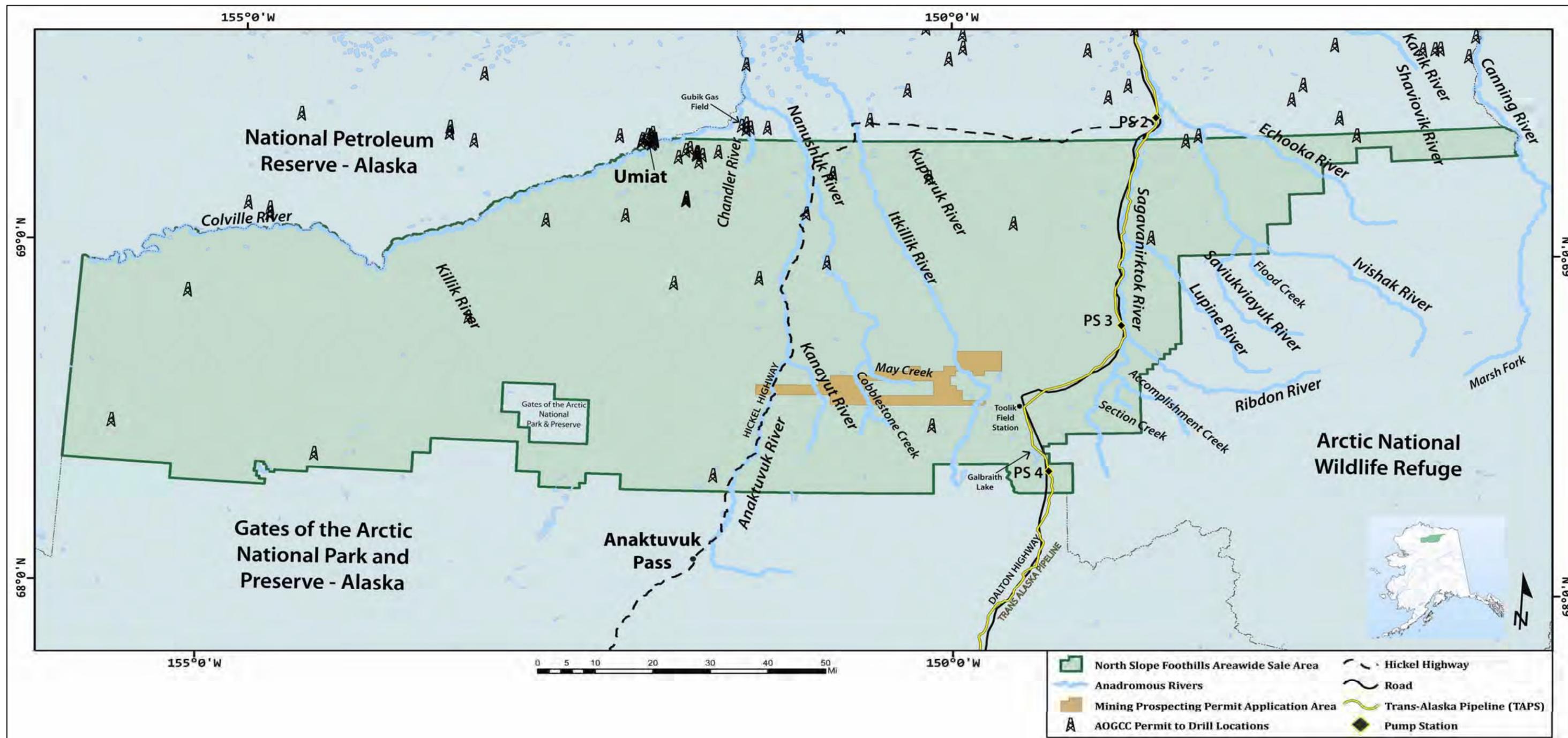
Source: Pedersen and Hugo 2005, citing to Pedersen 1979.

Map 5.7. Subsistence harvest area for all resources, Anaktuvuk Pass.



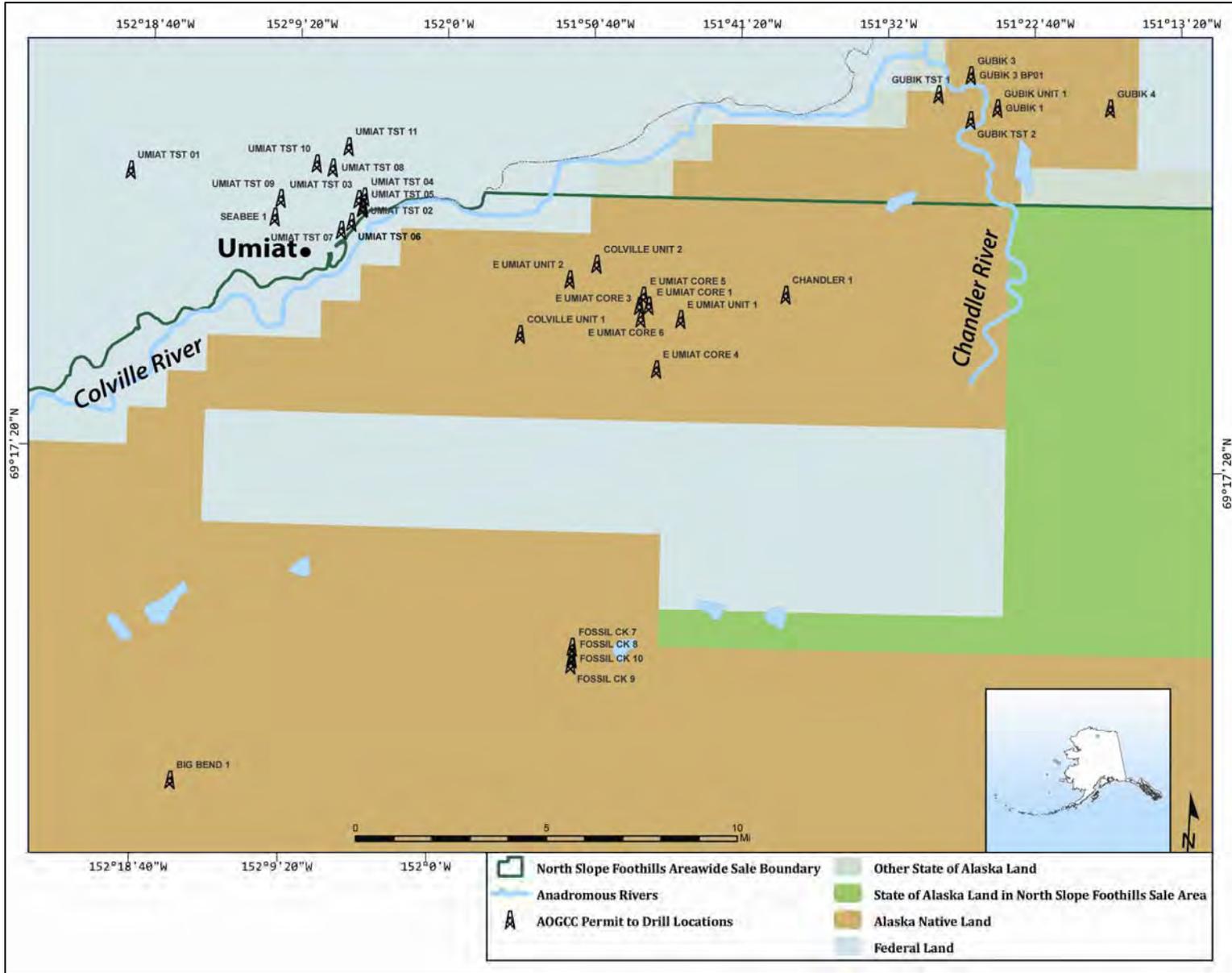
Source: Pedersen and Hugo 2005, citing to Pedersen 1979.

Map 5.8. Subsistence harvest area for fish, Anaktuvuk Pass.



Source: ADNR MLW 2009; AOGCC 2010.

Map 5.9. Oil, gas, and mining infrastructure and proposed mining permit application area in the North Slope Foothills area.



Source: AOGCC 2010.

Map 5.10. Oil and gas well locations in the Umiat area.

