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The ethnohistory of caribou hunting and interior land use on Nunivak Island

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Abstract: A combination of oral history accounts, archaeological and historical data reveal that inland caribou hunting was an essential component of the *Nuniwarmiut* [Nunivak Eskimo] subsistence economy, in both prehistoric and historic times. The local character of caribou hunting is fully described, and the significant role of outside hunters in depletion of the island's herd is explicated. Consideration is then given to the implications these data have with regard to general theory on caribou and caribou hunting; current models of local and regional prehistory; and future research at other insular settings in Alaska.

Key Words: Oral History, Emigration and Overhunting, Southwestern Alaska

Introduction

The use and importance of caribou to Eskimo peoples in the central Bering Sea region of Southwest Alaska has been treated in the anthropological literature in a way that suggests these animals were never common there, especially in historic times. In this paper I present evidence demonstrating that such a conclusion is false.

I attribute the lack of information on caribou to two things. First, research bearing on traditional subsistence patterns in the region has largely focused on marine mammals, fish, and the *coastal* manifestations of Eskimo culture. Large land mammals like caribou have received minimal attention. Thus, although ethnographers and archaeologists alike acknowledge that the central Bering Sea region once supported caribou, they largely disregard the species' importance to this region's aboriginal and historic human populations (e.g., see Andrews 1989:254-285; Fienup-Riordan 1982:17-23; 1983:33-38, 65-140; Nowak 1982; Okada et al. 1982; Shaw 1983; Wolfe 1979:32-45; cf. Lantis 1946:155). Anthropologists' pervasive lack of interest in caribou as a human resource in this region indirectly reinforces a major error in the best-known general reader on Alaskan Eskimos. That is, the categorical assertion that the Togiak people of Bristol Bay were the only "Yup'ik"-speaking caribou hunters who survived into historic times (Oswalt 1967:249).

Second, sustained EuroAmerican contact with many of the region's Eskimo groups did not develop until after 1850; and some, like the *Nuniwarmiut*,[1] did not experience *sustained* contact until after 1900 (US BIA ANCSA 1995(1): 9-18). The motivations behind these contacts, their nearly exclusive coastal or "big river" focuses, and their limited durations (Pratt 1984:106-111) are directly correlated with the minimal data generated about caribou—which by all accounts were scarce in this region by 1880 (e.g., Nelson 1887:285; cf. Ray 1975:174; Skoog 1968:226, 240-244; US Census Office 1884:15). In fact, by that date Nunivak was home to the only extant herd of caribou in the central Bering Sea region (Ager 1982:49; Kurtz 1983:Book 3 [9/17/83]). The Nunivak herd's existence was in jeopardy by the early 1880s (Nelson 1880; cf. Griffin 1999:179), however, and it reportedly had been exterminated by 1890 (Petroff 1892; US Census Office 1893:113; cf. Sonne 1988:102).[2]

Cultural Background

Looking inland

Nunivak Island (Figure 1) is roughly 96 km (east-west) by 64 km (north-south) and is separated from the Yukon-Kuskokwim mainland by the 40-km wide Etolin Strait. Volcanic in origin, the island's topography is highly varied (see Pratt 1997). Its generally

[1]Collectively, the people of Nunivak Island can correctly be referred to as *Nuniwarmiut* or *Cup'it*. The latter term is a plural form of *Cup'ig*, which designates the dialect of Central Yup'ik spoken on Nunivak. I avoid the use of "*Cup'it*" as a group designation for the Nunivak people, however, because the term could be interpreted as applying to certain speakers of the Hooper Bay-Chevak dialect of Central Yup'ik. That is, people from the mainland village of Chevak refer to this dialect as *Cup'ik*, a plural form of which is *Cupiit*. They collectively identify themselves as *Cupiit*. [Interestingly, although they are considered by linguists to speak the same dialect as that spoken in Chevak, people from the nearby village of Hooper Bay call their language "*Yup'ik*" and regard themselves as *Yupiit*.] Finally, despite the similarity of their locally ascribed terms of identification, the Nunivak and "Chevak" dialects are very different.

[2] With regard to caribou on Nunivak Island, my use of the term "herd" is restricted to mean a breeding population (cf. Burch 1991:444). Edward W. Nelson reportedly estimated this herd was once 25,000 animals strong (Griffin 1999:179 [note #29]). This figure initially struck me as an extreme exaggeration of the number of animals the island could potentially sustain, even for a short period of time; but then I learned that Nunivak held an estimated 22,000 reindeer in 1944 (US DOI 1949:45). In any case, since Nelson never visited Nunivak his estimate of the local caribou herd's size clearly was based on second-hand information (at best). Similarly, his remarks concerning this herd's extermination must also be considered with caution—as must those of his contemporary, Ivan Petroff. Whereas Nelson was never on the island, Petroff only saw part of Nunivak—and virtually none of its interior (Pratt 1997).

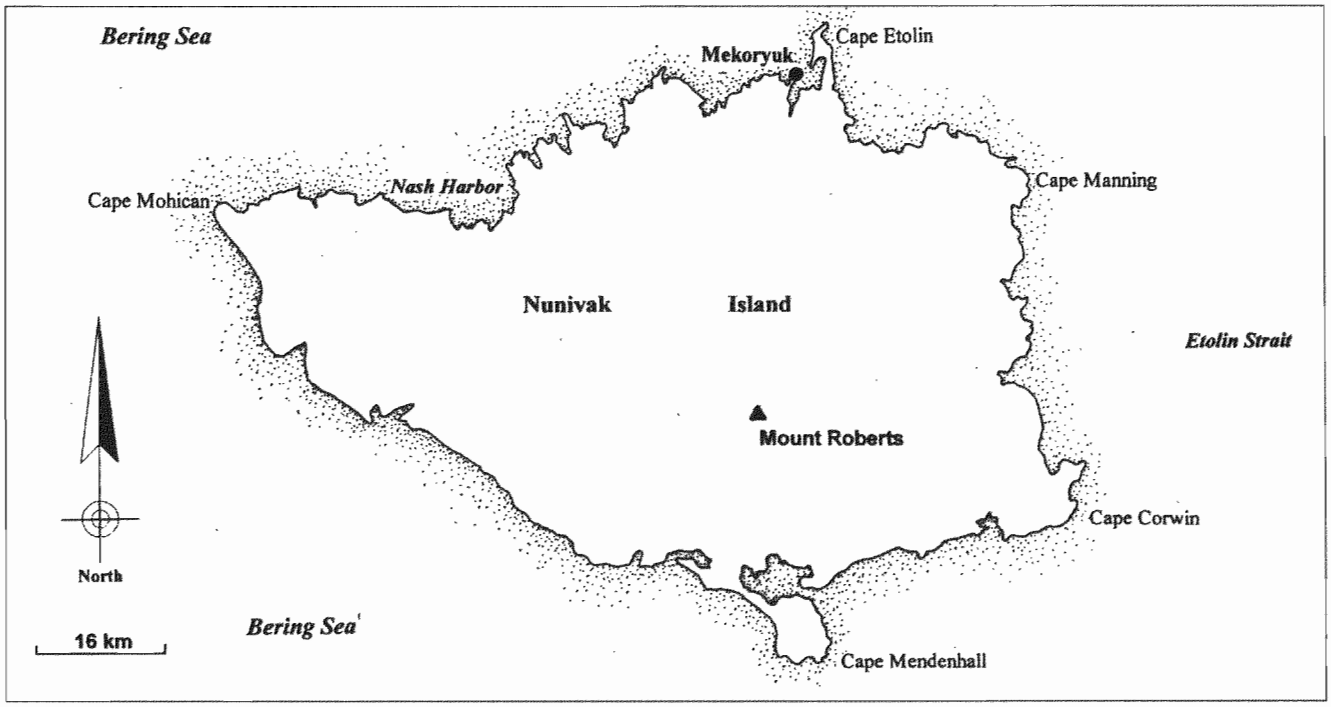


Figure 1: Nunivak Island

rugged and rocky coastline includes sheer cliffs up to 140-m high, as well as extensive estuaries and lagoons, broad sandy beaches, and dune formations up to 40-m high. The interior is dotted with hundreds of lakes and ponds, and scores of hills, cinder cones and butte/mesa-like landforms with elevations ranging from 230-m to a high of 511-m above sea level (at Mt. Roberts). Over 70 streams radiate from the interior to peripheral lowlands.

Numerous settlements were occupied throughout the island before 1900, but by 1940 just seven permanent, that is "winter," villages remained (Lantis 1946:156, 162). Today, the only functioning village is Mekoryuk. *Nuniwarmiut* settlement and subsistence patterns along the island's coastal margin have been well documented, but published accounts contain scant information about interior land use and the role of caribou in the traditional economy.

The most detailed historical account regarding caribou hunting (i.e. Curtis 1930:32-33; cf. Van Stone 1989:10-11) fills less than one page of text. As a whole, the literature suggests the island's interior was not essential to its human inhabitants, whose existence was thought to be strictly rooted in the marine environment. This notion first appeared in print in 1930 when Edward Curtis (1930:5) claimed that, "Few Eskimo have penetrated the interior, which is given over to the recently introduced [domestic] reindeer and to foxes and other animals."[3] As much as 60 years later, anthropologists have reinforced this viewpoint by stating or clearly implying that the *Nuniwarmiut* lacked an "inland orientation" in prehistoric as well as historic times (see Nowak 1982:87; Van Stone 1989:40). These assumptions derive from speculation by individuals who never visited or otherwise concerned themselves with the island's interior: i.e. their negative evidence for an inland orientation is based on never having looked for one.

That the *Nuniwarmiut* used the interior at all is indicated only in passing references to caribou hunting and overland travel between villages (e.g., Curtis 1930:32-33; Lantis 1946:164-167, 195; cf. Pratt 1994:336, 354). The fallacy of this viewpoint was plainly revealed through fieldwork on Nunivak conducted between 1986 and 1991 by the Bureau of Indian Affairs (BIA) in compliance with Section 14(h)(1) of the Alaska Native Claims Settlement Act (ANCSA) of 1971 (see Pratt 1992). A central component of this work was oral history research, an effort that has documented an extensive cross-island trail system (Figure 2) and hundreds of interior place names. The derivations of numerous place names are related to caribou. Examples include *Qassarwig*[4] ("place for raw [caribou] meat [eating]"), *Cirunret* ("antlers"), *Tunurnilngut* ("smelling/tasting like back fat"), and *Urasqarremiut* ("village/residents of *Urasqaarer* [white or gray clay which is mixed with caribou hair to make pottery]") (Drozda 1994:26 [03.42], 41 [04.44], 80 [05.126A], 117 [09.47]; Robert Drozda, personal communication, 4/25/01).

[3] Reindeer were introduced to Nunivak Island in 1920 (Stern et al. 1980:47), reportedly due in no small part to the efforts of Edward Nelson (US DOI 1949:43). These animals are wild, not domesticated.

[4] Italicized Native names and terms are spelled in accordance with accepted orthographies. *Cup'ig* spellings follow those presented by Drozda (1994), Pratt (1990, 1997), or US BIA ANCSA (1995)—but ongoing work with the dialect is likely to result in orthographic changes.

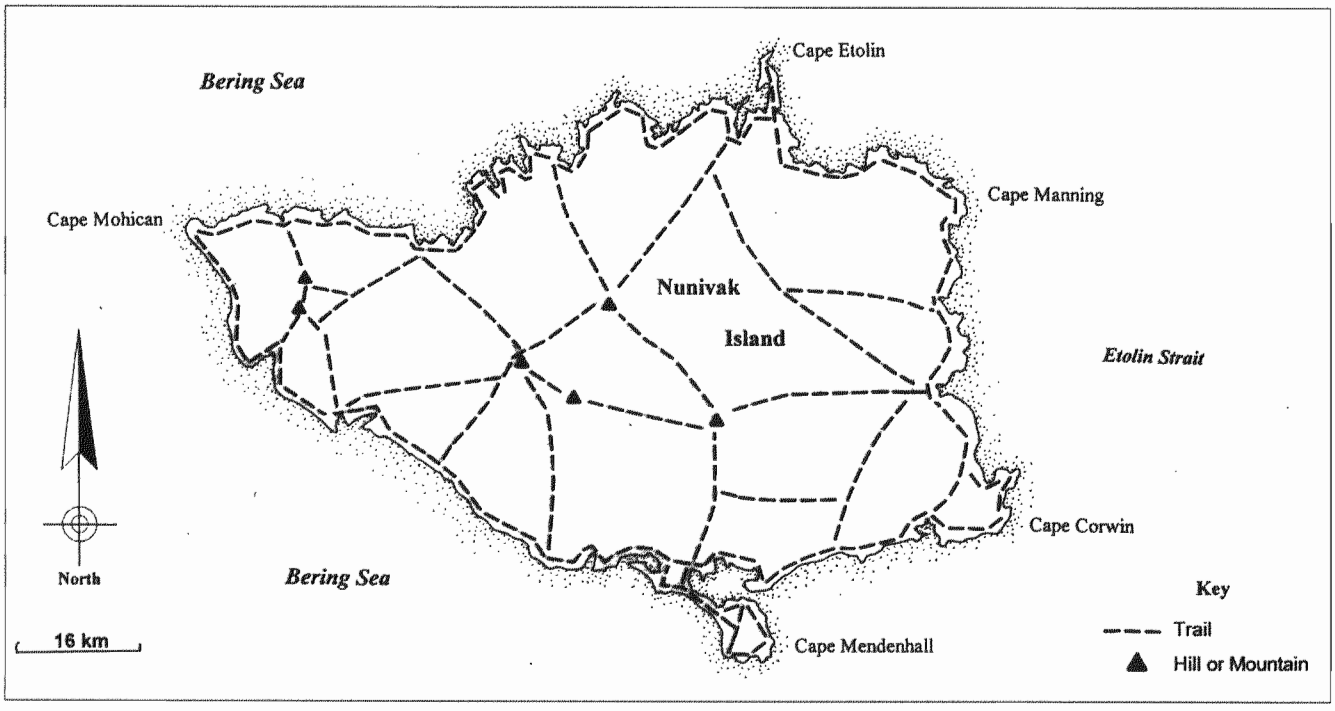


Figure 2: Cross-island trail system

Aerial survey coverage of the interior was not comprehensive and only a few areas were walked over. Nevertheless, this effort led to the discovery of 70 separate interior sites containing an estimated 500 stone shelters (e.g., Figure 3), in addition to other stone features such as caches and cairns (cf. Stewart et al. 2000).[5] These results suggest the true number of interior sites and stone shelters on Nunivak is substantially higher. Nearly all of these shelters are heavily encrusted with lichens; others are almost completely overgrown with tundra (Figure 4). These features [singular: *qawartarwig*, "place to sleep over; place to spend the night" (Amos 1991a)] were referred to as "houses" by Nunivak elders, who associated them with caribou hunting and ascribed their existence to "the ancestors"—a clear indicator that the elders lacked firsthand knowledge about caribou hunting. However, they possessed valuable information about this subject via oral accounts passed down from their elders (e.g., see Griffin 1999:332-345).

Characteristics of caribou hunting sites

The large number and variety of shelters already documented suggests a biologically successful caribou herd subjected to long-term exploitation by the island's human population. Some hunters reportedly used the same shelters over and over again (Noatak and Kolerok 1987a); and it is likely that abandoned or unoccupied shelters sometimes served as caches. But the abundance of stone on Nunivak indicates the construction of such features would have been comparatively quick and easy almost anywhere on the island, so many individual shelters may have seen only limited use. Of the 70 interior sites known to contain stone shelters just seven have been systematically surveyed and mapped. Disregarding the single-feature site, shelters constituted 65% or more of the total features recorded at five of the six remaining sites (Table 1); and the three largest of those sites contained 104, 78, and 59 stone shelters, respectively. Research at similar caribou hunting sites in the Canadian Arctic led Friesen and Stewart (1994:348) to infer that "all surface dwelling features at a given site were occupied contemporaneously" (cf. Stewart et al. 2000:268-269). In addition to being impossible to prove, that inference is difficult to accept because it assumes overly static patterns of human land use and settlement, and also implies unreasonably large and stable site populations.[6] With regard to Nunivak Island, I reject the notion that all 'dwelling features' at caribou hunting sites were occupied contemporaneously and, therefore, also do not believe that

[5] In 1991, shortly after hearing a summary of this physical evidence, one archaeologist familiar with the island dismissed the idea of interior land use prior to modern times by flatly stating that [traditionally] the *Nuniwarmiut* had no reason to go into the interior—adding that, "After all, they didn't have Eskimo nautilus clubs" in those days. The meaning of this cryptic statement still eludes me, but I think the gist was that people would only have gone into the island's interior if they wanted a strenuous physical workout. This anecdote exemplifies how far some researchers will go to justify entrenched viewpoints, regardless of the evidence.

[6] This same type of thinking is expressed in a recent analysis of prehistoric settlement patterns and population in the Shumagin Islands (Johnson 1992). In this case, the researcher uses barabara "floor-sizes" as determinants of individual household populations, then treats those populations as constants for the functional life of each barabara—throughout the entire prehistory of the Shumagin Islands. Obviously, this analysis also assumes prehistoric human residents of the Shumagins enjoyed a continuous "horn of plenty" with respect to subsistence resources.

Figure 3: Features 46-48, at *Qiurtuli*

individual site populations can be accurately calculated from the number of such features (cf. Krupnik 1993:247).

Stone shelters used by Nunivak caribou hunters normally had maximum wall heights of less than 1.0 m, but walls up to 2.7 m high were recorded. The hunters' gut-skin rain parkas, held in place by caribou antlers or walking sticks, were placed across the tops for roofs (e.g., Smith 1991). Some shelters were completely enclosed but many had distinct wall openings, or entrances (Figure 5), the majority of which faced downslope. Most such features were constructed of large upright slabs or stacked rock and sod blocks; but others were essentially built around huge boulders, natural rock overhangs, or natural crevices which had been modified with stacked rocks (Figure 6). The floors of some shelters had been excavated, and others were slab-lined. Shelters with interior diameters as large as about 3.5 m have been recorded and multiple shelters sometimes shared common walls, but most were only large enough to accommodate one hunter. Even still, oral accounts indicate these features were sometimes continuously occupied for weeks at a time (US BIA ANCSA 1995(1):53); and some hunters are said to have spent most of the summer in pursuit of caribou (Noatak and Kolerok 1987a). These accounts are supported by a striking observation made by Lantis: "Three generations ago [i.e. ca. 1880], hunting caribou with bow and arrow in summer almost approached the spring and autumn seal hunts in importance" (Lantis 1946:255; cf. Sonne 1988:101-103).

Lakes or narrow headwater tributaries of major streams are sometimes adjacent to locales at which these shelters occur; and the extremely rocky, boulder-strewn terrain characterizing most of these locales suggests the probability that naturally occurring crevices and depressions formed basins that may also have held water. Snowbanks and spring run-off no doubt provided additional water. Where drinking water was scarce hunters are said to have carried it to the sites in seal-gut parkas, mukluks or other waterproof containers (e.g., Williams 1991a; Peter Smith, Sr., personal communication, 9/9/91). Finally, the absence of trees on the island means that the only sources of fuel for fires were driftwood, dwarf birch, and willow. Together with the predominantly interior settings of most caribou hunting sites (atop landforms covered with vassicular basalt or alpine tundra) this was a major reason why Nunivak caribou hunters typically did not have fires. When fires were built, however, they reportedly were placed *outside* the hunters' shelters (Kolerok and Kolerok 1991a).

The overwhelming majority of stone shelters occur on volcanic hills—which probably also served as lookouts—amid jumbles of exposed bedrock; and they tend to cluster at slope breaks or terrace edges, affording protection from prevailing winds (Smith 1991). But other such structures are located on flat, open ground in isolated contexts. Similarly, although most are found in the interior, morphologically identical stone shelters have been documented atop sea cliffs and along major lagoon systems at historically

Figure 4: Feature 33, at *Qiurtuli*

Table 1: Stone features recorded at interior sites

Site Name	ANCSA & State Number	Feature Count	Shelters	Cairns	Pits or Caches	Rings, Walls or Lines	Other	Shelters as % of Total Features
-unknown-	AA-9265 XCM-072	23	15	6	0	0	2	65%
Ingrirer	AA-9296 XNI-089	15	3	12	0	0	0	20%
Entuli	AA-9323 XNI-102	73	59	13	1	0	0	81%
-unknown-	AA-9330 XNI-091	1	1	0	0	0	0	100%
Qiurtuli	AA-9331 XNI-103	127	104	6	12	5	0	82%
Ingrilukat Nasqurat	AA-10422 XNI-125	45	33	9	1	2	0	73%
Siimaleg	AA-10424 XNI-090	94	78	9	2	5	0	83%

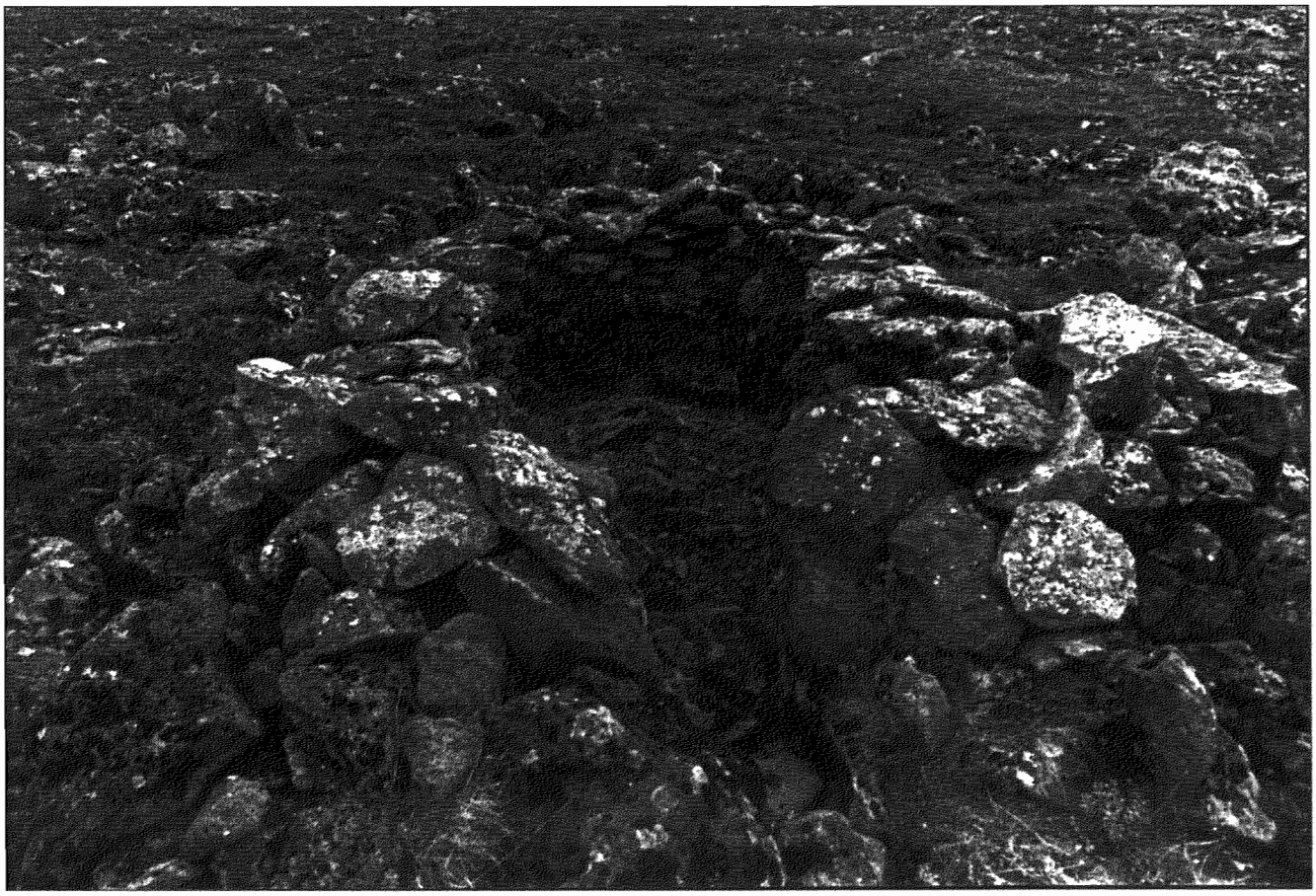


Figure 5: Feature 18, at *Iqangmiut* (on Duchikthluk Bay)

important coastal settlements. This underscores the fact that such structures were not used exclusively for caribou hunting. Oral accounts report that stone shelters at sites in Nunivak's coastal margin have been used as emergency shelters and/or in association with fishing, goose hunting, and the harvesting of greens, migratory seabirds and eggs (see Pratt 1990; US BIA ANCSA 1995 [Vols. 2 and 3]). At least one of these structures was also used, secondarily, as a grave. Also, between about 1940-1960, local reindeer herders occasionally used shelters located throughout the island (Amos 1991b; Smith 1991). By and large, however, the presence of stone shelters seems to be the result of caribou hunting activities.

Methods of caribou hunting

Caribou provided the *Nuniwarmiut* with skins for clothing, boots and bedding, food, sinew for thread, and antler and bone from which a variety of tools were fashioned (Amos 1991b; Griffin 1999:344-345; Kolerok and Kolerok 1991b; cf. Burch 1972:362).[7]

Caribou hunting was most intensive in early summer (e.g., Amos 1991b; Lantis 1946:155, 173, 195; Nelson 1899:119, 234; Kolerok and Kolerok 1991b; Noatak and Kolerok 1987a; Olrun 1991; Smith, personal communication, 9/9/91; cf. Van Stone 1989:10). This was when the animals' skins were in prime condition (Nelson 1887:286; cf. Burch 1972:343, 362) and it was also the calving season; as elsewhere, on Nunivak the skins of caribou calves were especially prized for clothing (Smith 1989a; cf. Fienup-Riordan 1988:8; Griffin 1999:332; Nelson 1899:119, 234). But, caribou were also hunted in the winter (Kolerok and Kolerok 1991b; Lantis 1946:172; Olrun 1991; Van Stone 1989:10; cf. Ray 1975:117) and evidence from the adjacent mainland suggests they were probably hunted in the fall, as well (see Andrews 1989:255; Oka 1982:38; Oswalt 1952:73; US Census Office 1884:5; Wolfe 1979:40).

In fact, caribou hunting was possible on Nunivak at any time of the year because the herd's insular setting prevented migration (cf. Lantis 1946:173). The strong currents of the 40-km wide Etolin Strait typically prevent its waters from freezing solidly in winter; instead, unstable flow-ice and large patches of open water characterize the strait during that season. Water conditions of this sort are not conducive to caribou migrations (see Burch 1972:347; cf. Kelsall 1968:43). Similarly, although caribou are strong swimmers and have been observed crossing 8 km or more of water

[7] Caribou also had an important role in *Nuniwarmiut* ceremonial life: i.e. their bladders were saved for use in the annual Bladder Festival (Fienup-Riordan 2000:125; Lantis 1946:183-184 [notes #37 and #38], 195; Sonne 1988:78-79). These animals apparently had a similarly important role in Bladder Festivals on the adjacent mainland (e.g., see Nelson 1899:383). The importance of caribou among the *Nuniwarmiut* is further evidenced by their representation in numerous traditional stories (e.g., Lantis 1946:265-286), and by restrictions imposed on young men after killing their first caribou (Lantis 1946:227).

Figure 6: Stone shelter at unnamed site near *Ing'errlag*

"where large lakes lie close to the path of major migrations" (Skoog 1968:99-100), there is no evidence to suggest these animals are capable of swimming non-stop across 40 km of rough water. Even assuming the caribou could swim at an extremely high average speed of 8 km per hour (cf. Skoog 1968:99-100), such a crossing of Etolin Strait would entail a minimum of five hours of continuous swimming. If it is, in fact, physically possible for caribou to perform such a feat it still seems unlikely the animals would embark on such a journey without some very compelling motivation. So, how did these animals reach Nunivak Island in the first place? The probable answer is, "no doubt, via the ice-pack" (Skoog 1968:230). As suggested above, winter conditions allowing such a journey would be extremely rare occurrences, but a single event could potentially be sufficient to start a herd.

A variety of techniques were used to harvest caribou (see Griffin 1999:337-343), but they were usually stalked or ambushed by hunters armed with bows and arrows (Curtis 1930:32; Lantis 1946:255; Van Stone 1989:10). Based on their status as experts in the associated hunting techniques, Nunivak elder Andrew Noatak (Noatak and Kolerok 1987a) reported that some caribou hunters were referred to by the following terms:

> ***Can'ircutulit***: expert bowhunters who put themselves in the path of fleeing caribou and were highly successful at killing animals as they passed by. (A grandfather of the late Kay Hendrickson was identified as a former expert at this style of caribou hunting.)
>
> ***Lavniarculuteng***: hunters who were experts at stalking ["sneaking up on"] caribou and were usually successful in securing their prey. During a stalk, whenever the caribou lifted its head to check its surroundings the hunter would stop and "pretend to be a tussock." This specific part of the stalking technique was referred to as ***ek'uunguareqluteng***. (A grandfather of the late John ["Unclejohn"] Kusowyuk was identified as a former expert at this style of caribou hunting.)

Noatak also commented on a basic, but easy to overlook, difficulty associated with hunting caribou with bows and arrows:

> When an arrow hit a caribou the one who shot it will keep [watching the animal] and soon it will separate from the herd . . . Some of the [caribou] they shot would not travel far . . . they would not go anywhere, just fall flat down. The ones they did not hit right, they would watch all the time, sleeping somewhere along the way, and hunt it down in the daytime. Sometimes [the animal] would take off while they were sleeping and they would lose it. They did not have an easy time of it (Noatak and Kolerok 1987a).

Table 2: Correlations of Cup'ig place names with English/common names

Cup'ig Name	English/Common Name
Mikuryarmiut	Mekoryuk
Qikertaaremiut	
Iqaqin Nunai	
Pengurpagmiut	
Qavlumiut	Kuvlomiut
Taprarmiut	Daprakmiut
Englulrarmiut	
Ami'igtulirmiut	Kanikyakstalikmiut
Qaviayarmiut	
Ingrimiut	Ingrimiut
Nuuteqermiut	
Paamiut	
Nunarrlugarmiut	Nunathloogagamiut
Tacirmiut	Duchikmiut
Ciguralegmiut	Chigoorhaligamiut
Tevcarmiut Waqlit	
Tacirrlag	Duchikthluk Bay
Iqangmiut	Ikongimiut
Cingigglag	Cape Mendenhall
Penacuarmiut	Binajoaksmiut
Carwarmiut	Chakwakamiut
Qayigyalegmiut	Kiyakyaliksamiut
Acakcum Nunii	
Talungmiut	Dahloongamiut
Tacirrarmiut	
Miqsarmiut	Mikisagimiut
Qimugluggpagmiut	Nash Harbor (west side)
Ellikarmiut	Nash harbor (east side)
Asweryag	Ahzwiryuk bluff
Negermiut	Nariksmiut
Kangiremiut	Kahnirukmiut
Ingrilukat Nasqurrat	Ingrilukat-Naskorat Hill
Ing'errlag	Mt. Roberts
Elliurruwig	
Entuli	Indooli Butte
Qiurtuli	Kikdooli Butte
Ingrirer	Ingriruk Hill
Siimaleg	Seemalik Butte
Qikertar	Triangle Island
Qassarwig	
Cirunret	
Tunumilngut	
Urasqarremiut	

Evidence presented by Griffin (1999:339-340) suggests *Nuniwarmiut* hunters sometimes donned caribou skins as camouflage to stalk their quarry (cf. Lantis 1946:172),[8] and caribou were also snared (Curtis 1930:32-33). In the latter strategy, hunters set sealskin lines or ropes along trails with the intent of snaring the animals' antlers or heads when they passed by (Kolerok and Kolerok 1991b). Like wolves, caribou also were trapped in pit-falls: i.e. "holes-in-the-ground" topped by very weak roofs and covered with grass to hide them (Kolerok and Kolerok 1989). Additionally, shortly after birth, at the peak of vulnerability (see Kelsall 1968:184-185), caribou calves were chased down and killed by both men and women (e.g., Kolerok and Kolerok 1991b; Noatak and Kolerok 1987a; cf. Griffin 1999:342-343; Nelson 1899:119; Zagoskin 1967:112, 291 [note #36]). In partial contrast to these accounts, it has previously been asserted that: "Women never hunted caribou, but in spring, after the arrival of sandpipers, they went out to pick up fawns [of the previous year] that had died during the winter" (Van Stone 1989:10).

According to Smith (1987, 1989b), in winter, when north winds were blowing, large groups of caribou reportedly used to move into the Cape Mohican area at Nunivak's extreme western end. When those conditions existed, residents of *Miqsarmiut* (on the island's northwest coast) would travel to the narrowest part of the cape and erect a "fence" of grass mats, leaving one opening. Once the trap was set, one or more men would drive the caribou toward the fence where the animals were dispatched with bows and arrows as they sought to escape. Many caribou were harvested in this way. Edna Kolerok (Kolerok and Kolerok 1991c) confirmed and elaborated upon this information, noting that her data derived from an extremely old woman named *Mirasgan* who formerly lived at *Miqsarmiut*. Kolerok described the 'fence' used in these drives as follows, "... they made a human barricade putting their [woven grass] mats with driftwood in between the lines of people" (Kolerok and Kolerok 1991c).[9] Mohican's coastal margins are sheer cliffs (see Pratt 1997:16-17) and its narrow, southernmost part contains two fair-sized lakes. Kolerok implied that the fence/human barricade would extend between the lakeshore(s) and the cliff edges, and noted that caribou were killed as they circled in search of an escape. Some animals typically fell over the cliffs to their deaths (Kolerok and Kolerok 1991c). The great difficulty involved in recovering these animals, however, suggests that caribou probably were <u>not</u> purposefully driven over the cliffs. Oral accounts about caribou drives by *Miqsarmiut* people are significant because they directly contradict Lantis' (1946:172) assertion that traditional

[8] This possibility is based on an ivory artifact collected by Edward Nelson. As discussed later in this paper, however, outside hunters were harvesting caribou on Nunivak—and living on the island for that specific purpose—before and during the period of Nelson's work in the region (i.e. 1877-1881). The fact that a firearm is engraved on the artifact strongly suggests it was not made before about 1870 (see Foote 1964:161-167). For these reasons, it would be unwise to automatically attribute the artifact's creation to a member of the *Nuniwarmiut*.

[9] The possibility that caribou antlers were also used as fence components is implied in a traditional story—"The Young Man"—recorded on Nunivak by Lantis (1946:278-280).

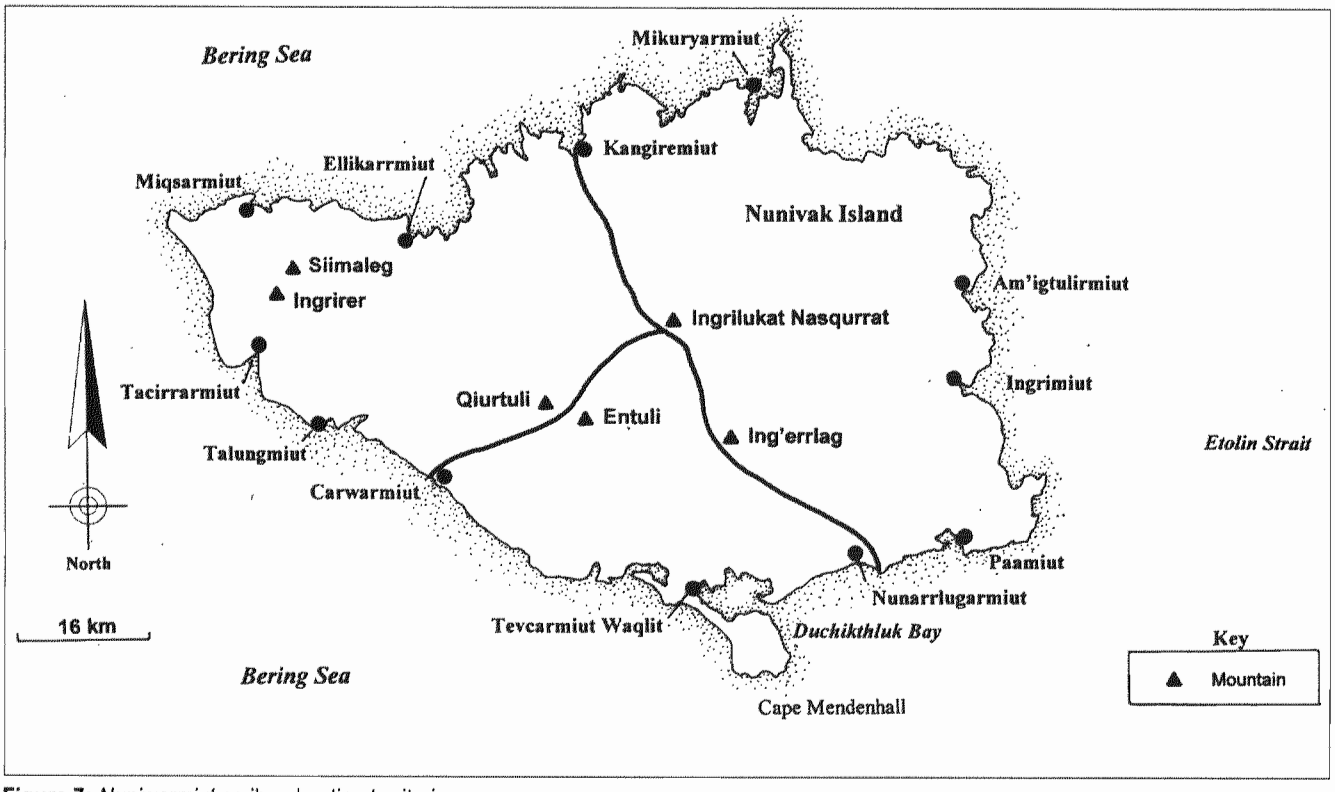


Figure 7: *Nuniwarmiut* caribou hunting territories

Nuniwarmiut hunting methods did not include "formal drives of game" (cf. Curtis 1930:32-33; Van Stone 1989:10).

Hunters butchered caribou at the kill sites (Lantis 1946:195; cf. Griffin 1999:343-344). After the meat was boned most of it was cached underwater in lakes and ponds, or in stone structures, and retrieved at a later date (e.g., Kolerok and Kolerok 1991b; Olrun 1991; Smith 1991; cf. Burch 1998:298; Stewart et al. 2000:275).[10] Meat that was transported back to coastal settlements was sometimes "cut into strips and sun-dried on drying racks" (Lantis 1946:179). Marrow was extracted from the bones at the kill sites; but hunters were warned not to eat the marrow while hunting because it would make them tired (Kolerok and Kolerok 1991d). Once extracted, marrow was usually stored in the caribou's heart membrane until the hunter could return to camp (Griffin 1999:344). Alternatively, it might be placed in the caribou's stomach lining then wrapped in the hide (together with meat), and hauled back to the hunter's village (Kolerok and Kolerok 1991d).[11]

The use of caribou hides as packs was more than a matter of convenience: i.e. during transport the inner layer of fat protected meat wrapped inside the hide against bruising (Noatak and Kolerok 1987a). Caribou bones were usually thrown into nearby lakes or ponds (Lantis 1946:195 [note 77]), or "buried" in stone caches (US BIA ANCSA 1995 (3):299, 304-305 [Photographs 3:199 and 3:200]). Collectively, these practices imply that caribou bones documented in archaeological contexts on Nunivak—at least at coastal sites—would not accurately reflect the true extent of caribou use (cf. Griffin 1999:344; Spiess 1979:173-174).

Hunting territories

Nuniwarmiut oral history accounts about caribou hunting contain information documenting the existence of socio-territorial boundaries between indigenous local groups (see Pratt 1990; cf. Lantis 1946:168, 178, 242). Individual caribou hunters reportedly used the same camp every year (Noatak and Kolerok 1987a), much as a contemporary family uses the same fishcamp each summer. But some oral accounts connect the island's most substantial caribou hunting sites to specific villages in ways that clearly denote discrete, recognized boundaries between the customary use areas of separate local groups on Nunivak. Thus, *Entuli* (Figure 3; Table 2) was used primarily by people from *Cingigglag* [Cape Mendenhall] and *Tacirrlag* [Duchikthluk Bay], whereas *Qiurtuli* and *Siimaleg* were used by people from the west coast villages of *Tacirrarmiut, Talungmiut, Ellikarrmiut*, and *Miqsarmiut* (Smith 1991). Similarly, Andrew Noatak (Noatak and Kolerok 1987a, 1987b) reported that *Entuli* was a hunting area for residents of

[10] The *Nuniwarmiut* also used stone structures as caches for seal/walrus meat and skins, berries, wild spinach, fish (eviscerated, but otherwise whole), fish eggs, and split salmon heads (US BIA ANCSA 1995 (1):52 and (3):79-81).

[11] Fat from the stomach lining was formed into balls and given to children as special treats when hunters returned home (Kolerok and Kolerok 1991d). These "fat balls" were referred to as *imanat*, a somewhat generic term that can also apply to guts/entrails, internal organs, etc. (Howard Amos, personal communication, 3/20/01).

Carwarmiut (on the southwest coast); and Peter Smith (1991) said it was the western boundary of the caribou hunting area for people along the southern coast from *Nunarrlugarmiut* westward to at least *Tevcarmiut Waqlit*.

The *Entuli* and *Qiurtuli* areas are important calving grounds for the present-day Nunivak reindeer herd. The prominence of these sites with regard to traditional boundaries between the customary caribou hunting areas of local populations of the *Nuniwarmiut*, the large number of stone features each site contains, and the known behavioral similarities of caribou and reindeer suggests the Nunivak caribou herd may also have used the *Entuli* and *Qiurtuli* areas as calving grounds.

The site of *Ingrilukat Nasqurrat* was possibly the southern, interior boundary of caribou hunting grounds commonly used by residents of north coast villages such as *Mikuryarmiut* [Mekoryuk] (Smith 1991; cf. Olrun 1991) and *Kangiremiut*. Caribou hunting areas used by residents of villages along Nunivak's east and southeast coasts (e.g., *Am'igtulirmiut*, *Ingrimiut*, *Paamiut*) were not specified; however, *Ingrilukat Nasqurrat* and sites from *Ing'errlag* [Mt. Roberts] eastward were probably all available to these people.

CARIBOU BESEIGED

Considerable effort was directed at obtaining local explanations for why and when caribou disappeared from Nunivak. Without exception, oral accounts attributed the disappearance of caribou to the actions of non-Nunivak hunters from as far away as the Seward Peninsula, a region essentially devoid of caribou by 1880 (Burch 1998:270, 283, 293-294; Dall 1870:147; Jacobsen 1977:151, 157; Nelson 1887:285; 1899:118; Skoog 1968:243; cf. Oswalt 1967:136-137). The fact that Iñupiaq and Yup'ik people traveled to Nunivak in the last quarter of the 19th century to hunt caribou is fairly well documented in the literature (e.g., Lantis 1946:173; Nelson 1887:285; 1899:229; Skoog 1968:330; Van Stone 1989:10).[12] In this context, it should be noted that a hill named *Elliurruwig* (Drozda 1994:82 [no. 06.16]) in Nunivak's interior (on which the remains of at least five stone shelters are found) was informally identified by local elders as "Teller caribou hunters' camp." Also, for about five years, "Teller people" who were on the island specifically for hunting caribou reportedly lived at the east coast village of *Am'igtulirmiut* (Peter Smith, Sr., personal communication, 9/9/91), and at a small site just upstream from that village (Olrun 1991). Located on Seward Peninsula, the village of Teller did not exist when these events were taking place (see Orth 1967:955; Ray 1964:75-77), so the association of "Teller people" with the visiting hunters is probably a reference to residents of the general area in which this village is located (i.e. the Port Clarence area).

Who were the "Qaviayarmiut"?

Overkill by Native hunters was ultimately responsible for the extermination of Nunivak's caribou, but it is noteworthy that hunters from other parts of Alaska did not have historical connections to the herd and, in fact, were not welcome on the island. Oral accounts express strong resentment toward them (cf. Fienup-Riordan 1984:74 [note #6]), particularly toward Iñupiaq hunters. This probably reflects their comparatively greater cultural and geographical "distance" from the *Nuniwarmiut*, and their presumed lack of kinship ties or trading partnerships with island residents. Several accounts collectively identified the Iñupiaq hunters as "Qaviayarmiut"[13] (e.g., Hendrickson and Williams 1991; Kolerok and Kolerok 1991b). Precisely which people this term designates is unclear (cf. Wells and Kelly 1890:9), but each of the following populations is a candidate: the "Malemut" of Kotzebue Sound (see Nelson 1899:229); the people of "Kaviak" village near the head of Imuruk Basin, east of Teller (e.g., Black 1984:494; Orth 1967:503; US Census Office 1884:11; Zagoskin 1967:126); residents of Port Clarence ["Kavyak Gulf" (Zagoskin 1967:124)], generally; the "people of Seward Peninsula"—formerly known as the "Kaviak Peninsula" (Nelson 1887:285; Zagoskin 1967:351); residents of the Kuzitrin River area (Burch 1998:54-55); or, members of Nelson's "Kaviagmut" tribal grouping, delimited as follows:

> The people occupying the coast from Port Clarence and around to Cape Nome, Golofnin Bay, and Nubviukhchugaluk [*Neviarcaurluq* (near present-day Elim)], including the interior of the [Seward] peninsula back from the coast country as well as Sledge (Aziak) island, are Kaviagmut" (Nelson 1899:26).

In any case, the available data strongly contradict Ray's (1964:64) categorical assertions that: (i) the disappearance of caribou from the Bering Strait region "was not a cause for the caribou hunters' invasion of another tribe's territory" (cf. Burch 1998:119, 303); and (ii) "With the exception of the southward movement of the Malemiut, there is no historical evidence that Seward Peninsula groups moved to other tribal territory" (cf. Burch 1998:8-9).

Adding to the puzzle, some Nunivak elders explicitly associated these people with St. Lawrence Island[14]; others asserted they

[12] The following is a good example. "When, in 1873-'74, the reindeer [sic] suddenly left the shores of Norton Sound, [the Malemute along Kotzebue Sound] pushed on in family parties from point to point until, in 1877-'78, they had reached Kuskokwim river, Nunivak island, and Bristol bay" (Nelson 1899:229).

[13] To reduce confusion, I do not italicize this term when it was used by Nunivak elders as a broad term of reference for all of the involved Iñupiaq hunters (as in this case), because it is also an acknowledged designation for a specific Iñupiaq social group—as well as a valid place name on Nunivak Island.

[14] Although he suggested the St. Lawrence Islanders were a separate and distinct group, Nelson (1899:26) "failed to record any special designation" for these people.

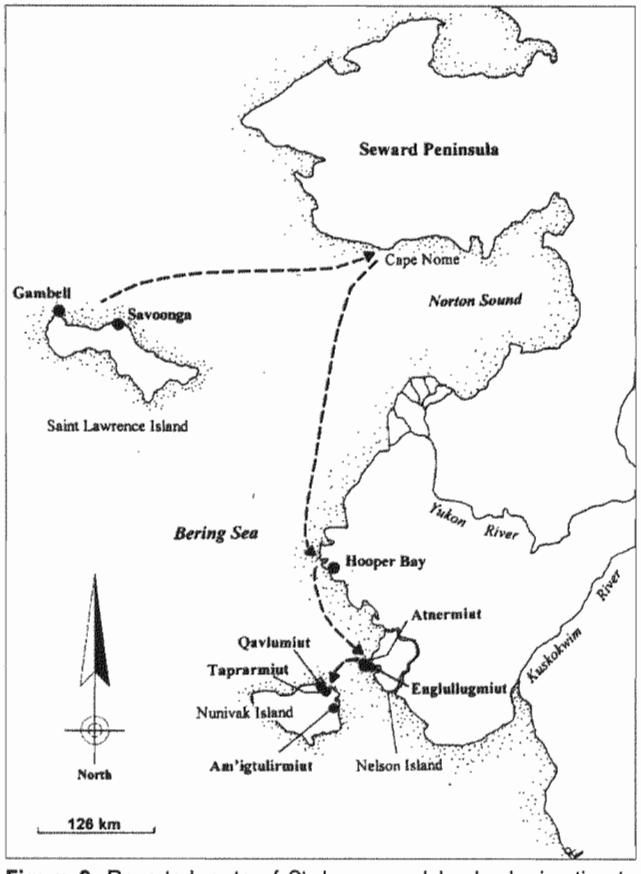


Figure 8: Reported route of St. Lawrence Islanders' migration to Nunivak Island

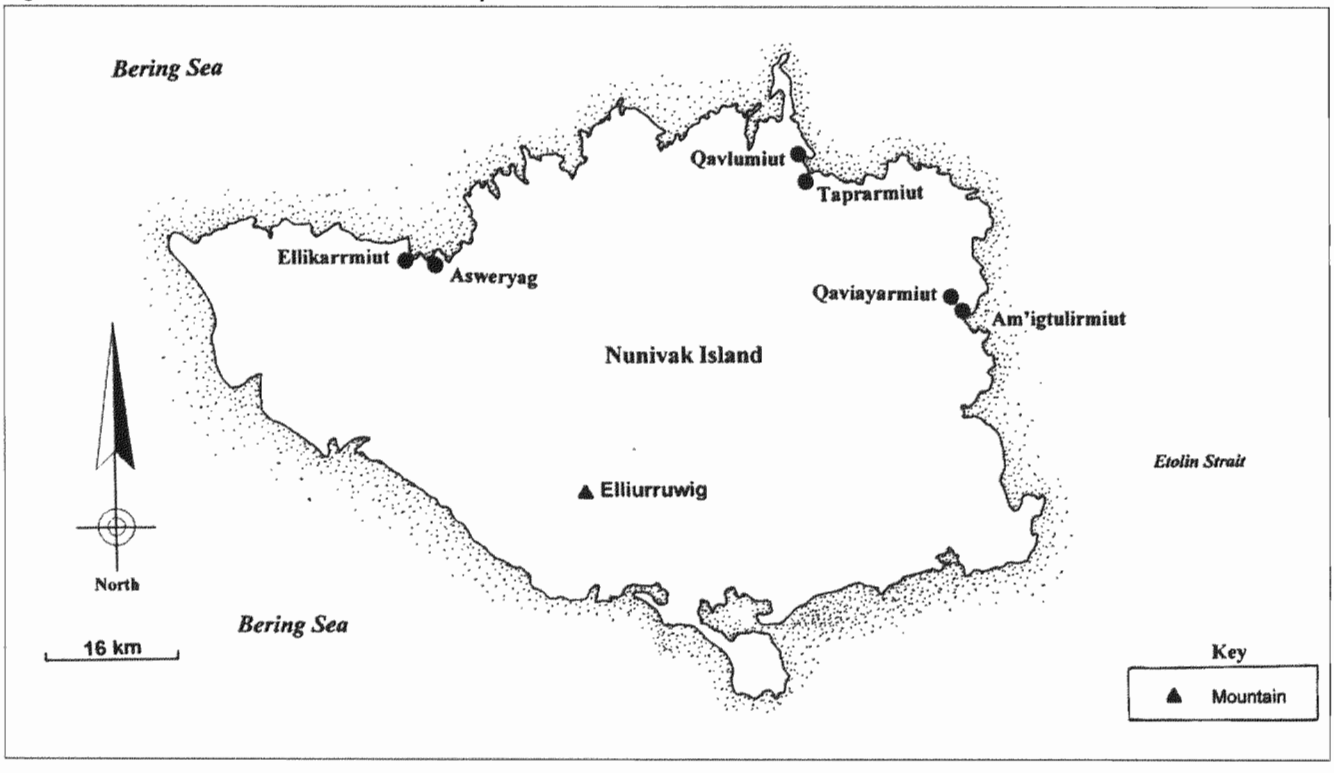
definitely did not come from that place, suggesting instead that they were probably from somewhere "behind Nome" (Kolerok and Kolerok 1991b). In my opinion, in *Nuniwarmiut* oral accounts the term "Qaviayarmiut" likely designates people from the Seward Peninsula in general; it may also indicate that the largest and/or first contingent of the invading hunters were Port Clarence area people (i.e. the *Qawiaraġmiut*), or speakers of the *Qawiaraq* dialect of Iñupiaq.[15] I also see no cause to reject the suggestion that St. Lawrence Islanders may have been among those hunters. Regardless of the actual point(s) of origin of these particular outside hunters, however, a settlement along Nunivak's east coast is actually named *Qaviayarmiut* because of its association with this group.

Based on information attributed to an elder from the St. Lawrence Island village of Savoonga, Jack Williams, Sr. (1991b) traced the these people to a settlement named "Qaviayag", reportedly located mid-way between Gambell and Savoonga.[16] He related the following account of this group's migration to Nunivak Island (see Figures 8 and 9).

[15] This dialect was spoken in the Kuzitrin River, Port Clarence, Nome, Fish River, and Golovin districts (Ernest S. Burch, Jr., personal communication, 4/25/01).

[16] The author has not found any evidence of a settlement with this name on St. Lawrence Island. Consideration must be given to the possibility that the Savoonga elder's information about the location of "Qaviayag" was in error, or was misinterpreted by the Nunivak elder to whom he related the associated migration story.

Figure 9: Nunivak sites associated with the "Qaviayarmiut"



For reasons unknown, the Qaviayarmiut reportedly left St. Lawrence Island and relocated to Cape Nome,[17] where they remained for two years before being kicked out by local Natives for improper treatment of fish and game animals. They then moved to Hooper Bay where, two years later, they were again kicked out by the locals, this time for "fooling around with fish" and wasting subsistence foods. The Qaviayarmiut next moved to Nelson Island (settling at either *Atnermiut* or *Englullugmiut*), but within one year the locals evicted them for "fooling around with rabbits" and wasting food. Finally they landed on Nunivak (at *Taprarmiut* and/or *Qavlumiut*), at which point they split up, half going to *Am'igtulirmiut* and the others to an unspecified location somewhere on the south coast. Soon after realizing that caribou occupied the island the Qaviayarmiut made a "human fence" and trapped many of the animals. They took only the caribou's eyes, however, then released the animals. The Nunivak caribou herd reportedly disappeared as a direct result of these actions and was never again seen.

This event happened in the summer. The following fall or winter the *Nuniwarmiut* captured the Qaviayarmiut and barricaded the entire group in a men's house at Nash Harbor (*Ellikarrmiut*) until all had died of hypothermia. The bodies were reportedly taken to *Asweryag* and buried under a large pile of rocks (cf. Griffin 1999:164-165; US BIA ANCSA 1995 (3):95-120). A feature matching this description was recorded at the site; it measured 3.7 m x 3.4 m x 1.0 m high.

Local views on the caribou's disappearance

The foregoing account is significant not only for its relationship with caribou, but also because it is one of the few references to intergroup hostilities (on Nunivak proper) documented in roughly 200 oral history interviews conducted with local elders since 1986.[18] Although unique in overall content, the account is entirely consistent with numerous others in explaining the caribou's disappearance as a sudden event, which culminated with the animals vanishing into the ground. That is, one day a large herd of caribou was seen going over the ridgeline of a hill; a man [the father of Andrew Noatak (Hendrickson and Williams 1991; Kolerok and Kolerok 1991d)] followed the caribou but when he reached the top of the hill and looked in the direction they had been traveling no trace of the animals could be seen. The caribou apparently vanished into the ground and were never again seen on the island (Kolerok and Kolerok 1991d; Olrun 1991; Williams 1991b; cf. Griffin 1999:334-335).

Responses to the question of *when* caribou disappeared from Nunivak were also interesting. With one exception, all of the elders consulted about this matter agreed that caribou had disappeared sometime before their births. The eldest of these individuals (Andrew Noatak [born ca. 1901]) identified the hunter who killed the last caribou on the island; but that hunter's son (Walter Amos [born ca. 1920]) could not confirm this report. Surprisingly, another elder (Jack Williams, Sr. [born ca. 1911]) claimed to have eaten a piece of the last caribou. Far from being incongruent, these accounts raise the possibility that isolated pockets of caribou may have survived on the island into the second decade of the 20th century. Nunivak's size and ruggedness suggest this possibility should not be summarily discounted. Additionally, by the early-to-mid 1880s the local herd may have been so reduced in numbers that caribou hunting was no longer a viable pursuit, even if some animals remained (cf. Nelson 1880; 1887:285).

THEORETICAL CONSIDERATIONS

Much of the ensuing discussion evaluates the Nunivak data on caribou hunting against relevant findings presented in two key papers by Ernest S. Burch, Jr.: his seminal (1972) work on caribou as a human resource, and a more recent (1994) study on rationality and resource use among hunters. These data do not bear on every question Burch addressed but they require modification to or rejection of some of his main points, and provide support for several others.

Seasonality of caribou hunting

The Nunivak Island caribou herd differed in one critical way from the major herds considered by Burch (1972): the Nunivak herd **did not migrate**. At most, it may have followed some pattern of localized, seasonal movements across the island (cf. Spiess 1979:47). This constitutes an exception to a central tenet of Burch's study: i.e. ". . . all parts of the range of every tarandus [caribou/wild reindeer] herd are devoid of animals during some period of the year (except, possibly, during population peaks) . . ." (Burch 1972:361). The flexibility of being able to hunt caribou at any time of the year set the *Nuniwarmiut* apart from most other caribou hunters (cf. Spiess 1979:20-21); for instance, caribou were undoubtedly a far more reliable annual resource to these people than they were to Native groups in most other areas (cf. Burch 1972:364-365; Krupnik 1993:236; Nelson 1887:285-286). Since the *Nuniwarmiut* did not have to focus on stockpiling meat before the caribou migrated they also did not have to worry about meat storage to any great extent (cf. Burch 1972:363). Thus, the *Nuniwarmiut* were not compelled to hunt caribou during the peak seasons in which these animals were typically hunted elsewhere. If

[17] In the context of this oral account, it is of some interest that Nelson (1899:231-232) reported the St. Lawrence Islanders formerly (i.e. prior to 1880) undertook trading voyages "along the American coast as far as Cape Nome."

[18] Another rare account of this sort concerns the theft by two "mainlanders" of caribou skins from local hunters' camps. The thefts were discovered in time to allow Nunivak hunters to track and catch up with the culprits at *Qikertar*, off Nunivak's northeast shore. The mainlanders were killed because: "They had committed a crime. It was the rule not to take things from other people. . . it was the strict rule of our ancestors" (Amos 1991a).

so inclined, they had the luxury of instead concentrating their efforts on fishing, sea mammal hunting, or the harvesting of migratory seabirds and waterfowl. Ironically, the absence of herd migration on Nunivak supports Burch's (1972:365) rejection of the paired assumptions that [caribou] "hunters characteristically follow their prey during the course of their annual migrations" and [caribou] "herds follow the same routes in their migrations."

Burch's influential study also contained the following assertion: "Late winter, spring, and early summer skins are worthless for almost any purpose, and only late summer skins are really adequate for clothing" (Burch 1972:362; cf. Kelsall 1968:211; Ray 1975:118). Recent findings indicate that statement is not necessarily an accurate description of reality across the whole spectrum of arctic/subarctic caribou hunters (e.g., see Nagy 1994:71), and it definitely does not apply to Nunivak Island. Even disregarding other uses to which caribou skins could be put, the absence of herd migrations and the rich diversity of other locally available resources, including birdskins for clothing (Pratt 1990; cf. Van Stone 1989:33-38), may have allowed the *Nuniwarmiut* to selectively target caribou calves for skins to be used in the production of clothing. This could explain why early summer has been consistently identified as the peak caribou-hunting season on Nunivak. Indirect support for the suggestion that calf skins were preferred for clothing in some areas is contained in the following quote regarding a village on the lower Yukon River:

> Toward night [on 14 June 1867] we reached the village of Starry (old) Kwikhpak [*Kuigpalleq* (opposite present-day Pilot Station)]. . . . The village was full of fresh skins of the reindeer [sic] fawn. I counted a thousand and seventy two bunches hanging up to dry. Each bunch contained four skins, or enough to make a parka. This would give a total of nearly four thousand three hundred of these little creatures, which had been killed during the past two months (Dall 1870:230; cf. Nelson 1887:286).

The Nunivak herd's year-round residence in a cold and extremely windy, maritime climate (see US DOI 1949:43-44) may also have mitigated against warble fly infestations, which might have resulted in a comparatively high quality of summer skins (cf. Burch 1972:343).[19] Even if calfskins were preferred, therefore, the *Nuniwarmiut* did not have to rely on the early summer hunt for skins because skins suitable for clothing could also be procured in late summer and fall.

Explaining the Nunivak herd's demise

Because "caribou populations experience long-term fluctuations independently of factors of human predation" (Burch 1972:356), determining the root causes for caribou declines or exterminations in Alaska, and elsewhere (e.g., Krupnik 1993:144-146), is often problematic (e.g., Burch 1994:172-174; Pratt 1984:33 [Note 2]; Ray 1967:174; Van Stone 1979:129-132). But there is no doubt that the primary factor behind the Nunivak herd's demise was the sheer number of hunters who became involved in pursuing an essentially "captive" caribou population (cf. Lantis 1946:173). For example, Charley Peterson, a fur trader based at Andreavsky on the lower Yukon River, reported that a contingent of hunters and traders represented by "20 or 30 bidarras [umiaks] and 150 to 200 bidarkies [kayaks]" took some 2,000 caribou skins from Nunivak Island in 1879 alone (Nelson 1879). The overwhelming majority of these vessels must have belonged to outsiders. Applying a conservative estimate of one hunter per kayak (x 150) and five hunters per umiak (x 20), Peterson's information suggests that an absolute minimum of 250 non-resident hunters converged on Nunivak's caribou in 1879. As if that year's harvest was not enough, the ensuing winter dealt another major blow to the island's herd. After a visit to Nunivak in August 1880, Peterson reported that "the deep snow last winter killed nearly all the deer so that the Malemuts [Iñupiaq (see Burch 1998:8-10)] and other outsiders living there are all going away this summer as they say if they do not they will starve during the coming winter" (Nelson 1880).

Despite the obviously high number of hunters involved, insufficient evidence exists to argue that the introduction and spread of firearms ultimately caused the demise of the Nunivak caribou herd (cf. Burch 1994:172-174; Nelson 1887:285; Skoog 1968:329-332; US Census Office 1893:114). Firearms brought about significant changes in hunting methods—sometimes increasing hunting efficiency—but it does not necessarily follow that hunters with firearms consistently killed more animals (cf. Krupnik 1993:234-235). More to the point, given that the island was the functional equivalent of a large "holding pen" for resident caribou, firearms were not necessary to bring about extermination of the Nunivak herd. Caribou drives would almost certainly have been the most effective means by which hunters could kill large numbers of caribou. And Nunivak's isolated setting, well outside the most heavily used routes of trade and commerce, suggests comparatively few firearms existed among the *Nuniwarmiut* as of ca. 1880 (cf. Foote 1965:161-167; Skoog 1968:330; Van Stone 1989:10)—and ammunition was probably rarer yet. Most firearms that had reached the island by that date were probably "excess" from other Native groups that had access to more technologically advanced models.[20] By extension, the only plausible way to correlate the spread of

[19] Warble flies evidently do not cause damage to the skins of reindeer in the modern Nunivak herd (George Williams, Sr. and Howard Amos, personal communication, 3/20/01.)

[20] This conclusion is indirectly supported by local oral history accounts (e.g., Amos and Amos 1991a; Noatak and Kolerok 1987a) and by the recent work of Dennis Griffin (personal communication, 2/01), who generously shared the following findings with this author. "Rifle cartridges collected by [Henry] Collins from historic graves, and those found in recent Nash Harbor excavations [Griffin 1999] reveal a wide variety of firearms were in use on the island during the late nineteenth and early twentieth [centuries] but that no variety appears to have been plentiful. Recovered cartridges usually consist of one example from most models (e.g., 40-65 Winchester, 45-70 Government issue, 40-82 Winchester)."

firearms with this herd's depletion (in a cause and effect manner) would be to assume that the vast majority of the arms involved belonged to non-local Native hunters.

The intensity of the "market hunting" that obviously occurred on Nunivak underscores the importance of caribou skins—the insulating qualities of which are well known—in historic trade systems (e.g., see Nelson 1887:285; 1899:228-232; Zagoskin 1967:100-102). It also raises several questions relative to Native ecological/religious values. On the basis of Alaskan and Canadian data, Burch (1994) suggests that hunters who abandon their homeland due to a paucity of game and emigrate to a new area lured by an apparent abundance of resources often destroy the very resources that attracted them to the new locale in the first place. The Nunivak data mirror this scenario, as suggested in the following quote:

> The decline in the Norton Sound caribou herd, at a time when the demand for skins and meat was increasing rapidly, caused the natives to exploit the caribou on Nunivak Island. By 1890, that herd had been destroyed, obviously a victim of excessive hunting. *These animals, however, had nowhere to retreat* (Skoog 1968:330 [emphasis added]; cf. Murie 1935:60).

Burch (1994:179-180) also suggested that "the removal of arational constraints on overhunting through religious conversion" was one major reason for the deterioration of Native American relationships to their environment after European contact. This cannot be demonstrated in the present case but, even without religious conversion, it is likely that religious beliefs had a role in the decimation of Nunivak's caribou herd. Specifically, the Iñupiaq and other outside hunters' lack of ancestral and spiritual relationships with the resident caribou (e.g., see Fienup-Riordan 1994:50-62; Loring 1997:185-186) probably eliminated a key constraint against overhunting that may well have obtained in their own homelands (cf. Sonne 1988:129-130). Nunivak oral history accounts about caribou hunting contain numerous remarks describing the disrespect shown to the animals by outside hunters, who were collectively condemned for such things as "throwing [the caribou] around" and cutting them up with axes (Kolerok and Kolerok 1991d), or taking only the skins and leaving the meat to rot (Van Stone 1989:10).

The Nunivak caribou herd's rapid and irreversible decline was triggered by overhunting (beginning in the mid-1870s) and further hastened by the heavy winterkill of 1879-1880. Other factors in this decline may have included disease, wolf predation, tundra wildfires, range depletion/overgrazing, and natural population cycles (e.g., see US DOI 1949:44-45).[21] In fact, caribou population "lows" were common throughout much of Alaska in the 1890s (e.g., Burch 1972:356-357; Skoog 1968:356-359) and this may have been true for Nunivak as well. In any event, the severely reduced population—if not the total loss—of this critical resource may have been a contributing factor, along with European epidemic diseases, in the massive reduction of the island's indigenous human population between ca. 1880-1900 (cf. Burch 1994:172). I have consistently argued (i.e. Pratt 1990:80; 1997:20-23; US BIA ANCSA 1995(I):22; cf. Griffin 1999:180-181) that none of the pre-1900 population estimates reported for Nunivak were based on a comprehensive census of the island and, as a result, all of those estimates under-reported the actual population. My work on this subject convinces me that the pre-1900 *Nuniwarmiut* population exceeded 1,000 people; in fact, I believe 1,200 is a reasonable estimate for that population. This comparatively large population was made possible by the island's diversified, predictable resource base (cf. Burch 1972:364-365)—the richness of which essentially accorded caribou, sea mammals, fish and birds equal importance in the pre-1900 *Nuniwarmiut* economy. Calculating a population of 1,200 against my estimate of the island's area (i.e. 6,150 km^2) yields a human population density of 0.195 people per km^2. This figure exceeds that of any of the seven Eskimo groups considered by Burch (1972:350 [Table 2]). Because my estimate of the pre-1900 *Nuniwarmiut* population is predicated on a highly diversified and reliable resource base (of which caribou were just one part), the Nunivak data provide indirect support for Burch's (1972:366) rejection of the assumption that "an abundance of [caribou] makes possible a human population of relatively high density."

Nunivak Island and human population dynamics

Outsiders' journeys to Nunivak for caribou hunting also raise interesting questions about mid-to-late 19th century intergroup relations and population movements, particularly since there is no evidence that conflicts occurred between the hunters of different "outside" groups that converged on the island. This apparent lack of conflict could potentially be the result of alliances formed by outside groups to overwhelm the *Nuniwarmiut*. Such a strategy would not only have minimized conflicts between members of the different outside groups, but also would have discouraged the *Nuniwarmiut* from taking offensive actions against those people. Then again, perhaps caribou were so valuable a resource (for food, tools, clothing and/or trade) to the involved Iñupiaq and Yup'ik peoples[22] that animosities which may have existed within or between these populations were set aside for the sake of successful hunting, even if success required co-utilization of the resource area. It is also possible that tolerance between groups sometimes increased when famine conditions or widespread resource shortages occurred, as suggested by the following account.

[21] Although the figure is open to debate, the optimal carrying capacity of the island with respect to the modern reindeer herd is estimated to be about 3,500 animals (US DOI 1949:46).

[22] By "Yup'ik peoples" I mean Yup'ik speakers from any or all of the following areas: Norton Sound, the Yukon-Kuskokwim mainland, and Bristol Bay.

> About the middle of March, 1880, between Cape Nome and Sledge island, I found a village occupied by a mixture of people from King island in Bering strait, Sledge Island, *and others from different parts of Kaviak peninsula.* These people had united there and were living peaceably together in order to fish for crabs and tomcods and to hunt for seals, as the supply of food had become exhausted at their homes" (Nelson 1899:24-25 [emphasis added]).

Readers familiar with Bering Straits socio-territorial groupings may downplay the potential significance of the above passage, because people from all of the areas named are generally recognized as having been allied to one another. Those relationships were also known to Nelson (1899:26), so the fact that he considered the situation unusual enough to comment on suggests the unspecified "others" at the village were not traditional allies of the named peoples. While this interpretation is open to question, the possibility that such situations were not uncommon (particularly after ca. 1850) is suggested by Ray's (1964:64) assertion that, "At times of famine everywhere [around Bering Strait], the kinship and tribal boundaries expanded to allow greater latitude of interaction."

Returning to the Nunivak case, specifically, how did trade factor into the equation? There is no doubt that some Iñupiaq groups had pre-existing trade relationships with Yup'ik groups on the Yukon-Kuskokwim mainland (see Foote 1965:111-112; Griffin 1996:98-101; Ray 1964:63-64, 86-87; 1967:390; Zagoskin 1967:100-102, 125; cf. Ray 1964:86), and possibly even with the *Nuniwarmiut* (cf. Griffin 1999:198-200). The most compelling information on this subject is contained in the journals of the Russian Orthodox priest Iakov Netsvetov, which reports Malemiuts at or enroute to the lower Yukon village of Pastolik in July of 1845, 1847, 1849 and 1851 (Black 1984:2, 38, 152, 262; cf. Griffin 1996:99-101). The fact that the July 1849 Malemiut contingent consisted of 13 baidaras (Black 1984:152) clearly implies that trade was an objective of their trip to Pastolik. The existence of such trade relationships would have facilitated the movement of Iñupiaq hunters to Nunivak; they might also explain some very interesting facts culled from the 1900 census. To wit, birth records contained in that census indicate Iñupiaq families were living along the lower Yukon River and on Nunivak Island for relatively significant amounts of time in the second half of the 19th century. Between 1874-1881, at least four Iñupiat (whose group affiliations were listed as "Kavaigmiut" [i.e. *Qawiaraġmiut*]) were reportedly born on Nunivak (cf. Griffin 1999:199), and another twelve members of this group are reported to have been born in lower Yukon villages between 1859-1899 (U.S. Census Office 1900). The census schedule for Pikmiktalik (just north of the Yukon River mouth) provides further evidence of an Iñupiaq migration to the lower Yukon area in the late 1800s: virtually the entire community was composed of *Qawiaraġmiut* in 1900.

On yet another front, a recent study of human remains being prepared for repatriation to Nunivak Island yielded additional, intriguing information relative to this question: i.e. it suggested "some biological affinity between the protohistoric and historic inhabitants of Nunivak Island and people from the Norton Sound region" (Street 1996:49). Overall, the study results were described as making ". . a strong case for the presence of complex population dynamics among historic groups in the Bering Sea region and [they] specifically illustrate some type of sustained interaction between Nunivak Islanders and groups as far away as Norton Sound" (Street 1996:49-54). Also of interest is the finding that some skeletal elements in the Nunivak sample may be the remains of St. Lawrence Islanders (Street 1996:6-7); but this does not prove those people were on Nunivak. Labeling or cataloguing errors—by the collectors or by museum personnel—could have caused the subject remains to be mistakenly included in the Nunivak sample (Steven Street, personal communication, 2/01).

Since many people on Seward Peninsula are thought to have been bilingual (i.e. they spoke both Iñupiaq and Yup'ik [see Ray 1964:85-86]), linguistic ties may also have facilitated the movement of caribou hunters from northwest Alaska to Nunivak Island. In the early 1800s, a continuous band of Central Yup'ik Eskimo speakers probably occupied the coastline from Bristol Bay northward to the Golovin Bay area of Seward Peninsula.[23] But the situation had changed significantly by 1850 due to the southward movement of Iñupiaq speakers into the Norton Sound area (e.g., Ray 1967:389-391; Woodbury 1984:52); consequently, the actual distribution of Yup'ik speakers between the Yukon River mouth and Golovin Bay at that juncture is poorly understood. Linguistic research has revealed evidence suggestive of past (sustained) contact between human populations of the Bering Strait area and Nunivak Island. According to Jacobson (1984:36), the Nunivak dialect is the most divergent of all Central Yup'ik dialects: it shares a major trait "with the nearly extinct Siberian Yup'ik Sirenik language and with Aleut"—and "has many words found nowhere else in Eskimo, and some words found also in Alutiiq but not elsewhere in Eskimo" (cf. Jacobson 1998:205). The highly unique character of the dialect suggests Nunivak Island may have been a crossroads for Native populations of the Bering Sea region, as a whole, long before the onset of the 1870s caribou rush (cf. Garber n.d.).

Uni-Directional oral history documentation

It is of considerable interest that the late 19th century movement of Bering Straits people to Nunivak Island for caribou hunting evidently has not been documented in oral history accounts

[23] Woodbury (1984:52) contends that: ". . in prehistoric times, Yup'ik languages [of Alaska and Siberia] almost certainly were spoken all the way across Seward Peninsula. Since the Bering Strait is known to have been crossed regularly by Eskimos from both sides, this must have amounted to a continuous Yup'ik-speaking region from Siberia to the southern parts of Alaska."

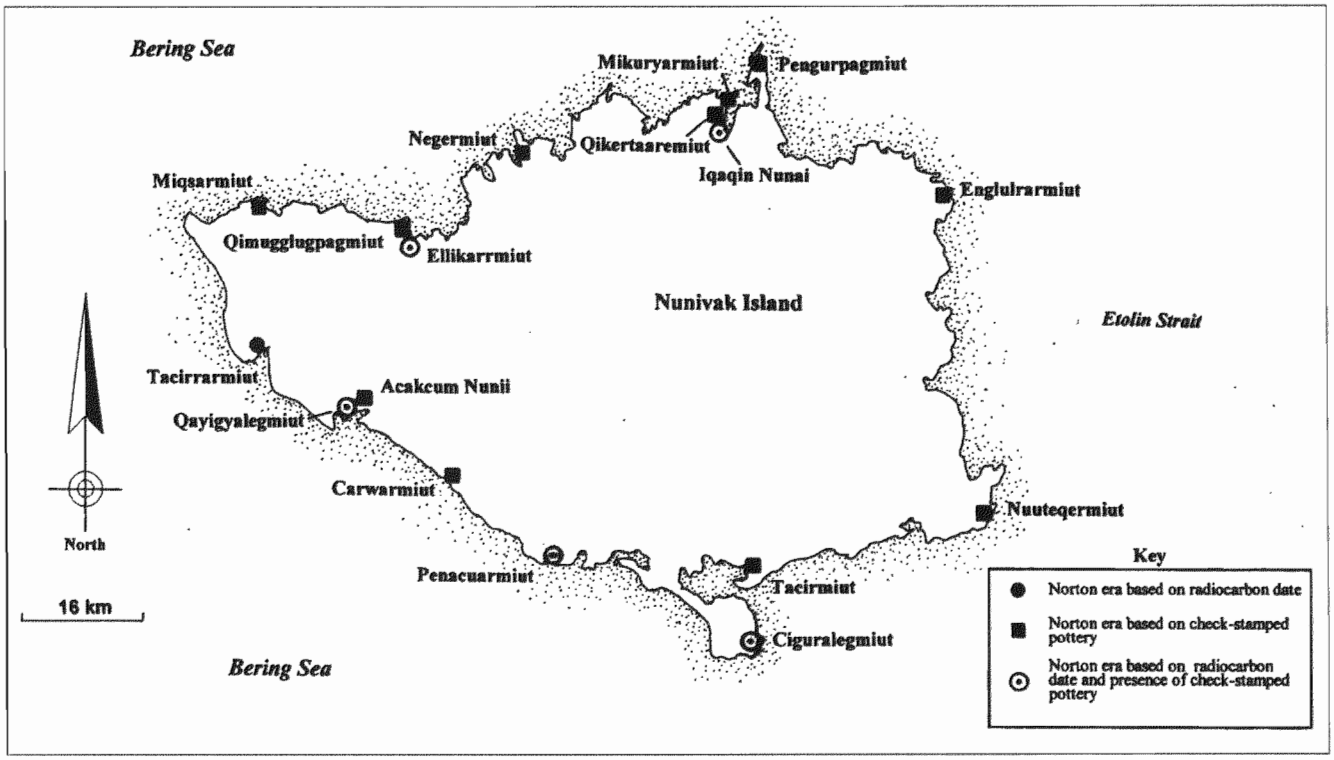
from that region.[24] Assuming they were even aware this had occurred, researchers simply may not have asked Bering Straits people questions about this subject. Then again, maybe their ancestors' travels to Nunivak for caribou hunting are not part of the remembered history of Bering Straits Natives. If so, this situation would be comparable to that described by Schweitzer and Golovko (1997) concerning memories of warfare—reported to date to before ca. 1850—between Siberian and Alaskan natives. They discovered that peoples on opposite shores of the Bering Strait hold contradictory memories of this warfare: i.e. Siberian attacks on Alaska are well documented in Alaskan Iñupiaq communities but completely unknown to Natives on the other shore (Schweitzer and Golovko 1997:1-3). The solution these authors offered for this puzzle is built around the term "memoryscapes" (see Nuttall 1992:39) which, in this context, "means that important events, such as warfare activities, are not just remembered in the abstract but with spatial reference to the places of their occurrence" (Schweitzer and Golovko 1997:4). That is, attackers/invaders are more likely to forget details of the associated events than are the victims whose homelands were attacked/invaded. In a recent paper on the subject of Siberian-Alaskan warfare, Sheppard (2001) takes this idea a step further. He suggests that differences in memories of warfare across the Bering Straits are better explained by the fact that Siberian attackers were composed strictly of male warriors, whereas the Alaskan defenders were essentially entire communities (i.e. men, women and children). Therefore, over time, far more Alaskans than Siberians would have had memories of these events to pass down to future generations. This idea can also be applied to the Nunivak case. Together, these linked concepts may help explain the lack of information in the oral histories of Bering Straits peoples about their forebears' caribou hunting excursions to Nunivak Island during the second half of the 19th century.

[24] This includes the following: over 150 oral history interviews with Bering Straits people by ANCSA 14(h)(1) researchers; independent oral history research done in the region by Ernest S. Burch, Jr., Matt Ganley, Charles Lucier, and Bill Sheppard; and published works by Dorothy Jean Ray (1964, 1967, 1975) and Kathryn Koutsky (1981) which relied heavily on oral sources.

IMPLICATIONS FOR NUNIVAK'S PREHISTORY

It is commonly accepted among Alaskan archaeologists that the earliest inhabitants of Nunivak belonged to the Norton tradition (e.g., Dumond 1987a:125-127; Griffin 1999:76-93; Nowak 1982:75; 1986a:165; Oswalt 1967:250; cf. Shaw 1982:61), meaning that human occupation of the island dates back no further than about 2,500 years before present. But our knowledge of Nunivak's prehistory (like that of the adjacent mainland [e.g., see Dumond 2000:16]) is so limited that few hard and fast statements concerning this subject can be supported with the available evidence. For example, Nowak's (1986a:166) speculation that more people lived on Nunivak in the late prehistoric period than during the Norton

Figure 10: Norton-era sites on Nunivak Island. (Sources: Collins 1928; Griffin 1999; Nowak 1967, 1970, 1986b; US BIA ANCSA 1995)



period must be considered groundless, because it can be neither confirmed nor refuted (US BIA ANCSA 1995(I):22; cf. Shaw 1998:242).

BIA investigations on Nunivak produced evidence that Norton occupations of the island were more widespread than previously thought[25] (Figure 10; Table 3) and *circumstantial* evidence (e.g., the proximity of major inland sites to coastal sites with major Norton components) suggests those occupations included an inland orientation associated with caribou hunting (cf. Dumond 2000:5). This is significant because on the American coast of the Bering Sea "insular areas such as Nunivak" are claimed to have been initially occupied by Norton peoples (moving southward from the Bering Strait area) who strongly emphasized the harvesting of littoral resources (Dumond 1987a:126-127; cf. Nowak 1982:87 [Nos.1 and 4]). Consistent with this viewpoint, on the adjacent Yukon-Kuskokwim mainland the earliest stages of the Norton tradition have been almost exclusively correlated with coastal adaptations (e.g., Okada et al. 1982:26; Shaw 1983:358-359; cf. Fienup-Riordan 1988:472 [note #91]). This is curious in light of excavation results from *Kaumllillermiut* (the so-called "Manokinak Site" [MAR-007]), which is located about 35 km inland from the coast and reportedly contains a major Norton component in which caribou bones are abundant (Shaw 1983:356-364). Thus, the implication is that—in the Yukon-Kuskokwim region—caribou **were not** a major resource in Norton times. The lack of consideration given to caribou as a human resource in these discussions also implies these animals had little significance in the subsistence economies of later "Thule" peoples (Norton's successors), who are thought to have been even more focused on littoral resources (e.g., Dumond 1987a:127; 1987b:46; Griffin 1999:80-83). Notwithstanding the paucity of archaeological data supporting it, this view of the regional prehistory has not previously been challenged.

Site Name	ANCSA Site Number	State Site Number	Other Designation
Mikuryarmiut		XNI-001	"Koot" (Collins 1928)
Pengurpagmiut		XNI-015	EN-1 (Nowak 1967)
englulrarmiut	AA-11346	XNI-016 [XNI-059]	CM-1 (Nowak 1967)
Nuuteqermiut	AA-9250	XCM-014 [XCM-029]	CC-1 (Nowak 1967)
Tacirmiut	AA-9260	XCM-002 [XCM-060]	DT-1 (Nowak 1967)
ciguralegmiut	AA-9270/AA-9318	XCM-001	ML-1 (Nowak 1967)
Penacuarmiut	AA-9281	XCM-005	
Carwarmiut	AA-9285	XCM-004 [XCM-084]	
Qayigyalegmiut	AA-9288 et al.	XCM-012 [XCM-086]	
Acakcum Nunii	AA-9324	XNI-080	
Tacirrarmiut	AA-9292 et al.	XNI-084 [XNI-085]	
Miqsarmiut	AA-9299 et al.	XNI-101	MT-2 (Nowak 1986b)
Qimugglugpagmiut	AA-9303 et al.	XNI-003 [XNI-097]	
Ellikarrmiut	AA-9303 et al.	XNI-003 [XNI-096]	
Negermiut	AA-9310	XNI-007	NT-1 (Nowak 1967)
Qikertaaremiut		XNI-027	MK-4 (Nowak 1967)
Iqaqin Nunai		XNI-028	MK-2 (Nowak 1967)

Table 3: Designations of Norton-era sites on Nunivak Island

The Nunivak data on caribou hunting indicate serious revisions to this model are needed. Logic, and the opportunistic tendencies of Eskimo peoples, indicates that if caribou were present they were also being harvested, regardless of the "orientation" of the culture (cf. Taylor 1966:119; Zagoskin 1967:222); and the evidence shows that caribou were present on Nunivak in Norton (Griffin 1999:156; Nowak 1982:80 [Table 1]; 1986a:159, 166), "Thule" and historic times. Unfortunately, testing of stone features at several interior sites in 1986 and 1991 failed to produce diagnostic artifacts or organic materials suitable for dating, and a lack of necessary baseline data on lichen growth rates in the region precluded lichenometric dating of these features. But a test at an unnamed site in the island's eastern interior produced caribou/reindeer bone, a trade bead, and a percussion cap. Another excavation at *Ingrilukat Nasqurrat*, virtually in the island's center, yielded a percussion cap, a quantity of caribou/reindeer bone, two portions of tobacco tin lids, and a brass screw fitting (Diters 1986). These results reveal little about the antiquity of these sites, other than indicating both were evidently in use by the late 19th century. Also, unless their presence is arbitrarily attributed to non-local hunters, the discovery of percussion caps at these sites challenges the accuracy of the assertion that "Bows and arrows were the only

[25] Counting the recent work by Griffin (1999), there are now 17 sites on Nunivak that have either been dated to the Norton era or are known to contain check-stamped pottery—a commonly recognized marker of the Norton Tradition (e.g., Dumond 2000:2-6; Shaw and Holmes 1982:5-6). Of those that have been dated, at present the two oldest sites are *Penacuarmiut* (2670+/-220 BP) and *Ellikarrmiut* (2580+/-40 BP) [see Table 4 for calibrations of these dates].

weapons used [by the *Nuniwarmiut*] in hunting caribou" (Van Stone 1989:10).

Still, the proximity of the most extensive caribou hunting sites (e.g., *Qiurtuli, Siimaleg, Entuli*) to major coastal settlements with early Norton components (e.g., *Ellikarrmiut*, *Penacuarmiut*) makes it inconceivable to me that Norton peoples did not use the island's interior; and there is no reason to assume this use (and the associated exploitation of caribou) was ephemeral or non-intensive (cf. Shaw 1983:359; 1998:241-242). Most of these coastal settlements are located at the mouths of substantial rivers, the drainages of which afford easy access to the interior. Thus, considered together with the fact that permanent village sites with *early* Norton components (e.g., *Ciguralegmiut* [dated at 2260+/-80 BP (see Table 4)]) also occupy highly exposed settings, the claim that "an expansion away from 'sheltered embayments'" did not occur on Nunivak until post-Norton times (Nowak 1986:166; cf. Shaw 1983:358-359; 1998:241) is not tenable.

In fact, systematic survey and testing of interior sites—and extensive testing of selected coastal sites—would very likely yield evidence of pre-Norton occupations of Nunivak (cf. Nowak 1982:87 [No. 5]; Van Stone 1989:2): that is, occupations associated with the Arctic Small Tool tradition (ASTt), in the restricted sense of the term. After all, ASTt assemblages (see Irving 1964; 1970) have been found from Greenland to the Alaska Peninsula (e.g., Dumond 1987a:79-93; 1998:62; Knuth 1954; Pilon 1994; Stanford 1971; cf. Maschner 1999:89-93), and possibly even to Unalaska (Knecht and Davis 2000). Furthermore, testing by BIA ANCSA archaeologists at the lower Yukon River site of *Ingrimiut* (an Eskimo village located about 32 km upstream from Russian Mission) produced charcoal that was radiocarbon dated at 3530+/-390 BP (see Table 4), squarely within the ASTt period. Given all of this, there is good reason to expect that evidence of ASTt occupations eventually will be found on Nunivak Island, as well as on the adjacent Yukon-Kuskokwim Delta.

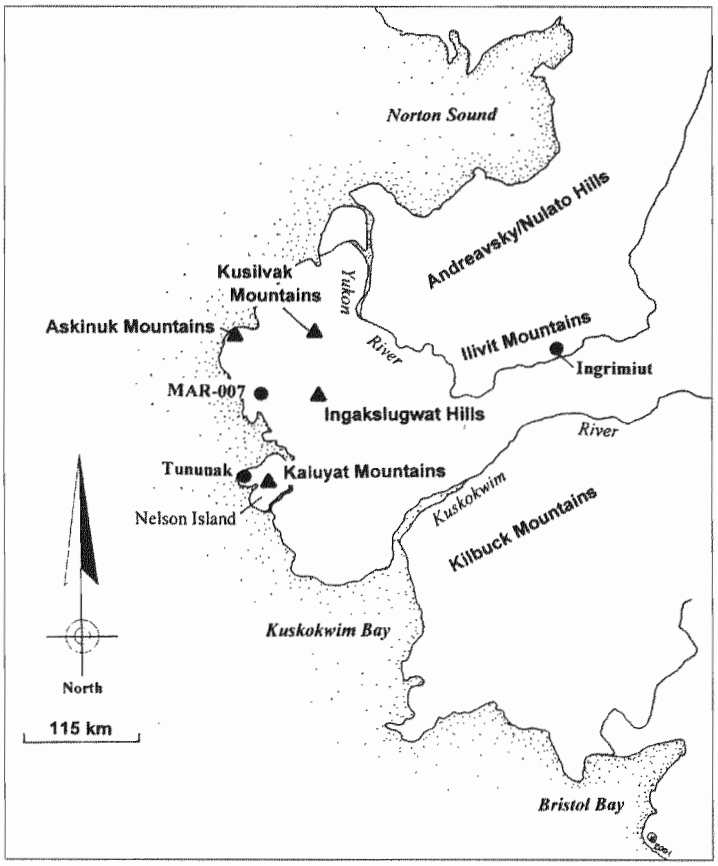
COMPARATIVE CONSIDERATIONS

The Yukon-Kuskokwim Delta

There is no doubt that caribou were also important to indigenous populations in the Yukon-Kuskokwim Delta, proper. Research focused on this issue could take several paths, the most promising of which begins with perusal of the collection of roughly 1,000 oral history tapes recorded with elders of this region during implementation of the ANCSA 14(h)(1) program, from 1975 to the present. Although largely unprocessed, some of these tapes are known to contain references to caribou—including information about hunting tactics and utilization of the animals (e.g., Polty 1985; Post 1984a, 1984b), shelter locations (e.g., Post 1984a), and harvest sites (Kurtz 1983). Oral history research with contemporary elders might yield additional information on caribou exploitation (e.g., see McClenahan and Andrew 1998). And there is a high probability that physical remains associated with caribou hunting—including stone shelters analogous to those on Nunivak—would be discovered through archaeological surveys in each of the following areas: the Kaluyut Mountains on Nelson Island; the Ingakslugwat Hills (cf. Shaw 1983:361-362); the southern Andreafsky/Nulato Hills; and the Ilivit, Kusilvak, Askinuk (cf. Fienup-Riordan 1984:74 [Note #6]), and Kilbuck mountains (Figure 11). In fact, as late as ca. 1870, one caribou herd was known to follow a common migration route from Norton Sound to the Kilbuck Mountains, and back, that could have taken the animals through any or all of the areas named above (see Murie 1935:61; Skoog 1968:228).

We know caribou occupied the delta historically (e.g., Dall 1870:229-230; Fienup-Riordan 1988:8; Nelson 1887:285; Oswalt 1952:48; 1967:127; Van Stone 1973:60, 64; Zagoskin 1967:99, 112-113, 222, 240), although their numbers and range no doubt fluctuated on a regular basis (e.g., Skoog 1968:219-221, 226-233). Following Skoog (1968:219), it is also reasonable to postulate that the existence of a caribou herd on Nunivak Island indicates a large population of caribou on the adjacent mainland at some time in

Figure 11: Selected Yukon-Kuskokwim Region sites and places mentioned in text



Site Name	ANCSA Site No.	State Site No.	Lab ID	^{14}C Age B.P.	Material	Calibrated Age (2 sigma)
Penacuarmiut	AA-9281	XCM-005	BETA-18591	2670+/-220 charcoal	Charcoal	BC 1398-358
Ellikarmiut	AA-9303 et al.	XNI-003 [XNI-096]	BETA-10071	2580+/-40 wood	Wood	BC 827-755
Ciguralegmiut	AA-9270/AA-9318	XCM-001	BETA-18589	2260+/-80 charcoal	Charcoal	BC 515- 90
Ingrimiut	AA-12374	RUS-008	BETA-18572	3530+/-390 charcoal	Charcoal	BC 2884-969

Table 4: Calibrations of radiocarbon dates mentioned in text. (Sources: Stuiver et al. 1998; Stuiver, Reimer and Braziunas 1998)

the past. Nelson's (1899:383) eyewitness report that caribou bladders were present at the *Qissunaq* [Kashunuk] Bladder Festival in 1878 suggests huntable populations of caribou may have remained in some areas of the Yukon-Kuskokwim mainland until ca. 1880. (But, it is also possible that the bladders in question resulted from *Qissunaq* hunters harvesting caribou on Nunivak Island.) Finally, caribou remains have also been recovered in every significant excavation performed to date on the Yukon-Kuskokwim mainland: i.e. Hooper Bay (Oswalt 1952:61-62, 73); *Kaumllillermiut* [MAR-007] (Shaw 1983:303); and Tununak (Okada et al.1982:20). Future excavations in this archaeologically under-studied region will no doubt shed additional light on prehistoric human use of caribou.

The long-standing tendency of anthropologists to overlook the role of caribou to specific cultural groups in this region is well-illustrated by information presented about the *Qaluyaarmiut* [people of Nelson Island] in Okada et al. (1982). The crew's ethnographer (i.e. Oka 1982:38) concluded that *Qaluyaarmiut* terms for the months of September and October were both related to caribou (cf. Jacobson 1984:670; Zagoskin 1967:231), and its archaeologists documented caribou remains in excavations on the island. Nevertheless, the final project report fails to consider the possibility that these animals were actively hunted by the *Qaluyaarmiut*, asserting instead that the people depended "on trade with their inland neighbors for large game products such as caribou" (Okada et al. 1982:26). No explanation is given for how caribou remains found in archaeological contexts were determined to derive from trade; but the paired assumption that caribou products must have come from the *Qaluyaarmiut's* 'inland neighbors' indicates the researchers were completely unaware that caribou once flourished on Nunivak Island, and also are reported to have inhabited Nelson Island (Skoog 1968:228-229; US Census Office 1893:110).

To fairly assess the role of caribou in prehistoric Eskimo economies of the central Bering Sea region requires that researchers: (1) apply greater critical objectivity to past findings; (2) avoid making sweeping generalizations based on extremely limited data (unless it is acknowledged that that is what is being done); and (3) actively seek out unpublished information.[26] In other words, solid research and scholarship is needed. Further archaeological research is also vital to this process; however, progress on this front may be slow since many of the most promising areas for such research are difficult and expensive to access.

Bering Sea and North Pacific Islands

The Nunivak data have important implications for research *outside* the Yukon-Kuskokwim region, as well, particularly at other insular settings whose Native occupants are also assumed to have lacked inland orientations (refer to Figure 12). For different reasons, the two most promising islands in this regard are St. Lawrence and Unimak. But Amak Island, Deer Island, and the Shumagin Islands—especially Unga—merit obvious attention based on reports that caribou were found there in precontact and/or historic times (Black 1998:128; Skoog 1968:218-221).

> The presence of caribou on these outlying islands is significant, because it implies a large population on the [Alaska] Peninsula itself. It seems doubtful that caribou would swim the 5-15 miles [3-10 km] necessary to reach these islands unless population pressures were fairly high on the mainland; of course, the animals might have

[26] A good example is the BIA ANCSA 14(h)(1) collection (see Pratt 1992), from which much of the information presented in this paper derives. Just because the vast majority of the information contained in this collection has never been published does not mean that it is inaccessible or unavailable for use (cf. Shaw 1998:236-237); it simply means researchers interested in mining its substantial depths will have to devote extra time and effort to their work.

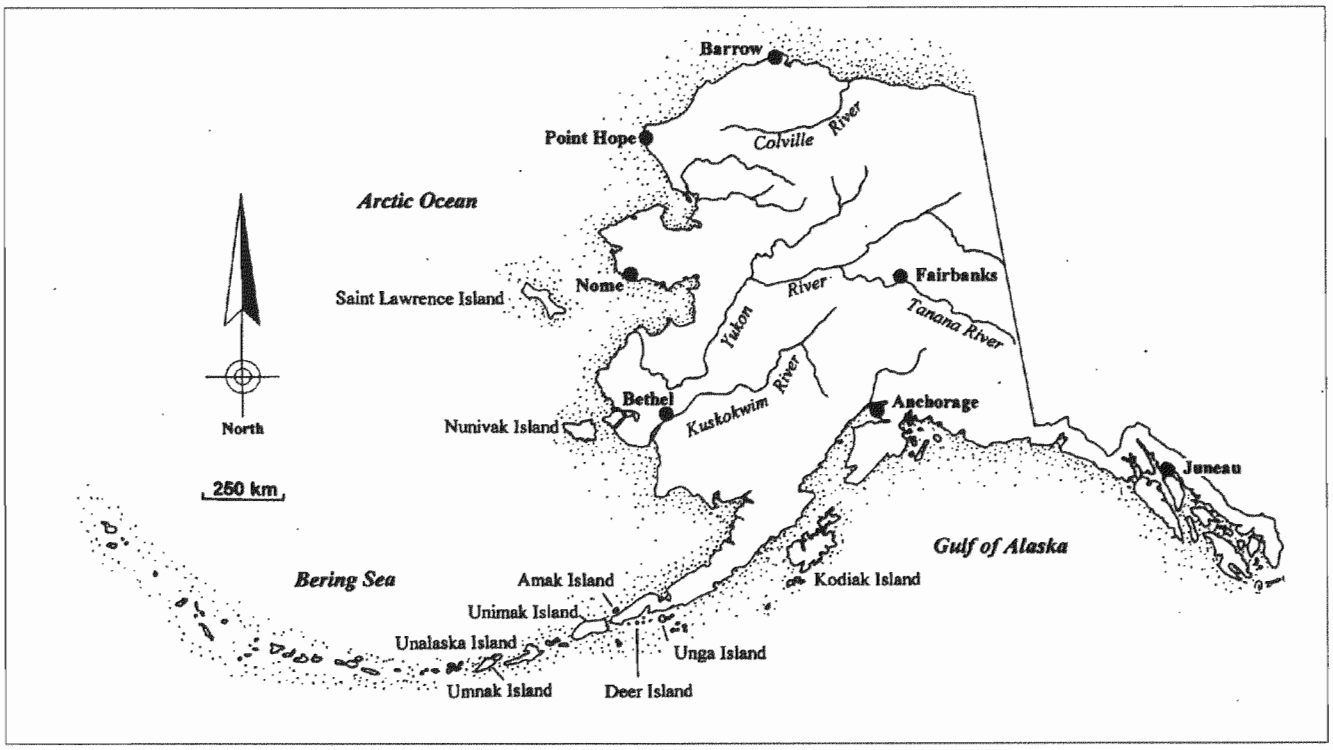


Figure 12: Map of Alaska showing islands where interior surveys are recommended

crossed via the ice-pack during an exceptionally cold winter (Skoog 1968:219).

The possibility that the Bering Land Bridge may have afforded caribou access to the present-day islands of Unalaska and Umnak (e.g., see Laughlin 1967:429 [Fig. 4]) make them intriguing candidates, as well. And, finally, Kodiak Island also deserves some consideration as a former home for caribou.

It is noteworthy that stone shelters/houses virtually identical to those found on Nunivak have also been recorded on Seward Peninsula (e.g., Schaaf 1995:110 [Figure 3.8], 231 [Figure 4.2], 240-244) and St. Lawrence Island (Bandi 1995:178 [Figure 10]). Most of those on Seward Peninsula are located atop prominent buttes or volcanic cinder-cones and are explained in association with caribou hunting activities (see Powers et al. 1982:56-63; Schaaf 1988:249-260). However, these site settings—combined with ethnohistorical accounts about territoriality and intergroup conflicts—have also led one researcher to conclude that some Seward Peninsula stone features were built for defensive purposes, related to conflict over caribou resources (i.e. Schaaf 1995:109, 288-300; cf. Powers et al. 1982:60; Schaaf 1995:290). Evidence offered in support of this conclusion is purely circumstantial. Similar features found on St. Lawrence Island have been exclusively interpreted as defensive structures built in response to Native intergroup warfare (Bandi 1995:176-180). One point must be made explicitly clear: there is *no evidence whatsoever* to suggest that stone shelters on Nunivak Island were built for defensive purposes or used in association with warfare. And the fact that warfare took place on St. Lawrence Island and the Seward Peninsula does not constitute evidence that stone features recorded in those areas result from such activity. It seems warfare is increasingly (and probably unjustifiably) invoked to explain archaeological anomalies and/or complex ethnohistorical problems that cannot be resolved with the available evidence. The St. Lawrence case exemplifies this tendency.

Although lacking firsthand knowledge of the sites, Native "helpers" offered Hans-Georg Bandi two different explanations for St. Lawrence sites containing stone shelters. Bandi logically dismissed the idea that these sites might have been used exclusively for bird hunting and egg gathering[27]—but he readily embraced the equally problematic suggestion that they "were hiding places and lookouts in case of attack from the sea" (Bandi 1995:178-179). His interpretation that these were defensive sites, exclusively, is evidently based on the fact that they occupied high-ground areas not visible from the seashore (1995:177-180). Yet, some of the sites in question contained at least 50 stone shelters! Bandi fails to explain why people intent on defending against enemy warriors would have built such a large number of *separate* structures at a site as opposed to massive stone walls or enclosures that could potentially afford protection for the entire group. More importantly,

[27] Nunivak Island cliff formations that were extensively used for bird hunting and egg gathering contain only a handful of such shelters (Pratt 1990; US BIA ANCSA 1995 [2-3])—despite intensive, repeated use of the areas and an abundance of stone in the immediate vicinity.

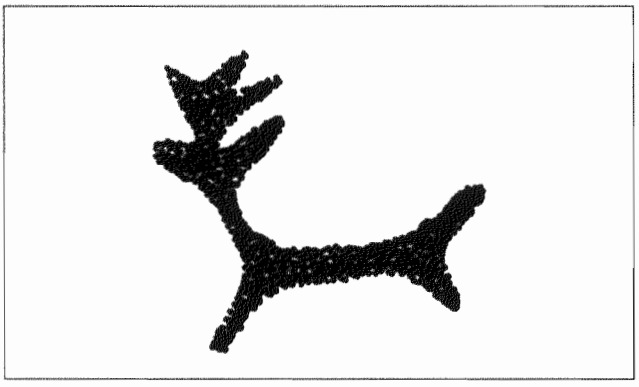


Figure 13: Kodiak Island petroglyph (after Knecht 1991)

however, his interpretation is not supported with hard evidence of any type (cf. Mason 1998:301-302). In sum, neither warfare nor bird hunting/egg gathering activities—alone, or in combination—seem to adequately account for the presence of sites with large numbers of stone shelters.

Could caribou hunting activities account for some of the stone structures on St. Lawrence Island? The literature consistently expresses the view that caribou were never present on that island (e.g., Bandi 1995:170-171; Collins 1937:247; Hughes 1984:262-277; Nelson 1887:285; Taylor 1966:116; cf. Crowell 1985:15; Murie 1936:345); however, this appears to be an unchallenged assumption, as opposed to an established scientific fact. Evidently, the possibility that caribou may have once inhabited the island has also never been explored through oral history research. Is there some compelling reason why caribou could *not* have reached or survived on St. Lawrence at any time in the past? Initial access to the island could have been via either the Bering Land Bridge or pack-ice. And St. Lawrence was certainly capable of supporting caribou: this is indicated by the reported increase of a group of 70 reindeer introduced in 1900 to a population estimated at 10,000 animals by the mid-1930s (Geist and Rainey 1936:6; cf. Hughes 1984:263-264). As a whole, these points suggest that 'looking inland' on St. Lawrence Island has potential to yield significant results.

The same can be said for the Aleutian Island of Unimak. The long-term presence of caribou on Unimak is well known (see Nelson 1887:285; Skoog 1968:218-226) and it is logical to assume that its indigenous residents not only hunted these animals but also established interior sites in the process. Certainly, such sites will eventually be found on the island. The possibility that Unimak, Unalaska, and Umnak islands were formerly parts of a single landform (see Black 1981:330-331 [Notes 11, 12]; Laughlin 1967:427-431) also should not be ignored; because, if true, then Unalaska and Umnak may have also harbored caribou in the distant past. Not surprisingly, none of these islands have been subjected to interior surveys.

Finally, some comments are necessary about caribou and Kodiak Island. At least one reference in the literature (i.e. Black 1992:165) suggests caribou were an important resource to the Kodiak people at the time of European contact. This is supported by the common occurrence of caribou antler and bones in archaeological sites on the island, the presence of which is thought to be the result of extensive, local trade with Alaska Peninsula peoples (e.g., Fitzhugh 1996:177; Jordan and Knecht 1988:261, 267; Steffian 1992a:158-160; 1992b:125-127). Alternatively, perhaps Kodiak Islanders regularly engaged in caribou hunting on the peninsula? Also intriguing is the documentation of petroglyphs on the island's southern tip depicting land animals among which "some horned form is suggested" (Heizer 1956:288). It is difficult to interpret a recent image of one of these petroglyphs (Knecht 1991) as anything but a caribou (Figure 12). This is hardly compelling evidence that caribou once occupied Kodiak, but consider a few other points. Kodiak's distance from the Alaska Peninsula mainland is nearly identical to that of Nunivak from the Yukon-Kuskokwim mainland. Thus, despite the lack of historic evidence for pack ice formation in the area, it may be within the realm of possibility that caribou crossed what is now Shelikof Strait and reached Kodiak at some point in the distant past (cf. Skoog 1968:207; Spiess 1979:33)—just as bears did. One Kodiak specialist has cautiously acknowledged this possibility by suggesting that the presence of caribou on the island during early prehistoric times, "could provide a functional explanation for the endurance of a typical mainland microblade and bifacially flaked projectile point industry through [the Ocean Bay] period, and the decrease in frequency of these implements through time" (Fitzhugh 1996:178; cf. Guthrie 1983). Their meager scope notwithstanding, these points hint that Kodiak Island might have held caribou in prehistoric times. Once again, interior investigations could shed light on this question.

CONCLUSION

It appears that many anthropologists concerned with Alaska remain advocates of the outdated Nunamiut (inland people)/ Taġiuġmiut (coastal people) model of human ecological adaptation developed for northern Alaska (see Larsen and Rainey 1948:24-36; Spencer 1959), despite ample warning that it is an oversimplification (e.g., Burch 1976; 1980:253-258; 1998:3, 8-11, 307-308). Worse yet, anthropologists have essentially applied this model (consciously or otherwise) to every region of Alaska occupied by Eskimo and Aleut peoples. Research concerning insular Eskimo and Aleut groups, in particular, is so biased toward "coastal" adaptations that the possibility these people may have had inland orientations has been almost completely disregarded (cf. Hanson and Staley 1984; Pratt and O'Leary 1999). With rare exceptions (e.g., Dall 1896:6-7), the published literature implies that even intra-island travel by these groups was restricted to coastal routes and watercraft. As an esteemed colleague once noted: "To find a quark you have to look for a quark." Similarly, I contend that it is

unscientific for anthropologists to perpetuate the assumption that Alaska's island-dwelling Eskimos and Aleuts have, since time immemorial, "lived by the sea, and died by the sea" without first making an effort to research the interior margins of their territories.

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